SCHOOL OF EDUCATION
FUNDAMENTAL STATEMENTS

Vision Statement
To be a globally competitive hub of education development
professionalization of educators, educationalists, researchers and mentors

Mission Statement
To provide exemplary leadership in transformative skill-based education
services founded on quality teaching and learning, research, innovation,
and life-long community service

Philosophy
Quality education for the service of humanity

Core Values
Honesty, respect, integrity, team spirit, democracy, inclusivity, transparency
and accountability

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School of Education, Kenyatta University, KENYA

Edited by:
Fatuma Chege
Emmanuel Manyasa

Layout & Design by:
William Orlale

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MESSAGE FROM CONFERENCE CHAIR

The School of Education, Kenyatta University successfully hosted the 2nd International Annual Conference on Education and Lifelong Learning at Kenyatta University, on 8th-9th October 2015, dubbed "the KU October Conference on Education". The conference was graced by renowned educationalists, namely, Dr. Evangeline Njoka (Chief Guest Speaker and First Chief Executive Officer of the Kenya National Commission for UNESCO); Prof. Kabiru Kinyanjui (Keynote speaker and International Development and Education consultant); Prof. Alemayehu Bishaw (Keynote Speaker and Associate Professor, Dean Graduate Studies, Bahir Dar University, Ethiopia); Dr. John Mugo (Guest Speaker and Director, Data and Voice, Uwezo, East Africa) and Dr. Hellen Amunga (Host Speaker and Lecturer, Department of Educational Communication and Technology, Kenyatta University). These high profile speakers provided the framework for thematic discussions guided by expertise, experience and knowledge in education and the various thematic areas of the conference.

The conference was organised to fall in October, which is the month the World Teachers' Day (October 5) is celebrated globally. The conference theme titled, "Post 2015 Development Agenda: Moving Education Forward" helped to accommodate a variety of relevant sub-themes that allowed the authors to address salient concerns in education in context of accomplishments of the Millennium Development Goals (MDGs) and recast in the era of Post 2015 Sustainable Development Goals (SDGs). The sub-themes covered in this issue focus on educational processes including pedagogy, curriculum development, use of technology and innovation, equity and inclusiveness, educational management and transformation, as well as planning for the overall quality of education. In this context, the conference was able to pursue its core objective of providing a structured platform via which education scholars, policy makers, practitioners, and students disseminate and share knowledge generated through research in the field of education under the chosen broad theme.

Being a relatively young conference that was launched on 31st October 2014, it is indeed a great pleasure to witness the fruition of this publication which adds value to our October Conference which, without doubt, enhances the mandate of disseminating evidence-based knowledge, elicit wider feedback from readers and motivate further discussions and research on topical educational issues. This publication goes a long way to strengthen the processes of conferencing beyond the event of the conference per se. I therefore take this opportunity, on behalf of the Conference Committee and on my own behalf, to wish you meaningful and enjoyable readership and welcome you to the forthcoming Annual October Conference.

Prof. Fatuma Chege
Chairperson, Conference Organising Committee &
Dean, School of Education, Kenyatta University
January 2016
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CONFERENCE PROGRAMME

2nd International Conference on Education and Lifelong Learning
8th - 9th October 2015
School of education, Kenyatta University

THEME: POST-2015 DEVELOPMENT AGENDA: MOVING EDUCATION FORWARD

Sub-themes:
1. Education and Emerging Issues
2. Research in Education Policy and Planning
3. ICT, Virtual Learning Technology in Education
4. Quality Education and Transformative Leadership
5. Education and Equity, Gender, Culture and Marginalisation
6. Teaching in Diversity and the Teaching Profession
Abstract

The study was aimed at exploring the challenges that learners with visual impairment face in accessing virtual education. The specific objectives were: To find out the population of learners with visual impairment participating in virtual education, to find out the successes in using assistive technology in virtual education, to identify the challenges that learners with visual impairment face in virtual education venture, and to describe possible solutions towards achieving virtual education by learners with visual impairment. The study was carried out at Kenyatta University, and the population comprised 80 learners and 5 staff members. Descriptive survey design was adopted. Questionnaires were used to collect data from the learners while personal interviews were conducted for the staff. Descriptive statistics was used to analyze quantitative data while thematic analysis approach was used for qualitative data. Tables and charts were used to present quantitative data while qualitative data was presented in textual mode. The study established that: e-learning had least enrolment of students with visual impairment, most of the students were not able to retrieve and use e-resources though their own efforts, e-learning platforms were not accessible to learners with visual impairment, more than half of the students found it difficult to use e-resources. The study concluded that: Learners with visual impairment lacked independence in using e-platforms; assistive technology is vital in accessing e-resources. The study recommended: University management to encourage independence of learners through provision of accessible e-learning platforms, information literacy and AT skills, and provision of adequate AT devices.

Keywords: Impediments, virtual education, e-learning, visual impairment.
Introduction

Virtual education has provided learners with a very flexible mode of study and many institutions of higher learning nationally and internationally are adopting this mode of study. While this move has provided learners with a more creative, interactive and flexible experience, there are dangers that some learners will be excluded because they cannot use standard methods of study.

Persons with visual impairment have the same need to have access to all kinds of information as everyone else and for the same good reasons – leisure, education, employment, etc. (Javier and Calvo, 2014). From a global perspective, the UN Convention on the rights of persons with disabilities, Article 21 asserts that “State Parties shall take all appropriate measures to ensure that persons with disabilities can exercise the right to freedom of expression and opinion, including the freedom to seek, receive and impart information and ideas on an equal basis with others and through all forms of communication of their choice ...” (Javier and Calvo, 2014)

It is with this background that this study was carried out to find out the challenges of accessing virtual education by learners with visual impairment with the aim of providing suggestions for better access.

Gap Identified

Whereas virtual learning offers remote learning opportunities, there is low adoption of this mode of study by learners with visual impairment in Kenyatta University. In addition, those in this mode of study spend a lot of time on the computer trying to access information from the virtual learning website. If this situation prevails, learners with visual impairment will continue lagging behind in the current changing times where virtual education is providing several opportunities like studying remotely. They will not be able to access electronic resources in all fields of study and more so in the electronic mode of study. The task of this study was therefore to identify the challenges that learners with visual impairment face in accessing virtual education. The ability to show the challenges would help the university management to consider ways of increasing accessibility of virtual education to learners with visual impairment.

Objectives

1. To find out the enrolment rate of learners with visual impairment in virtual school.
2. To establish the level of success in using assistive technology in accessing e-resources.
3. To identify the challenges that learners with visual impairments face in virtual education venture.
4. To describe possible solutions towards achieving successful virtual education by learners with visual impairments.

Research Questions

1. How big is the percentage of learners with visual impairment in virtual school?
2. How successful is the use of assistive technology in accessing e-resources?
3. What are the challenges that learners face in the virtual education venture?
4. Which efforts are made towards achieving virtual education by learners with visual impairments?

Theoretical Framework

The study adopted the Experiential Learning theory proposed by Carl Rogers (1983). The theory distinguishes two types of learning: cognitive (meaningless) and experiential (significant).

According to Rogers, learning is facilitated when: (1) the student participates completely in the learning process and has control over its nature and direction, (2) it is primarily based upon direct confrontation with practical, social, personal or research problems, and (3) self-evaluation is the principal method of assessing progress or success.

In his theory, Rogers emphasized the following:

1. Significant learning takes place when the subject matter is relevant to the personal interests of the student
2. Learning which is threatening to the self (e.g., new attitudes or perspectives) are more easily assimilated when external threats are at a minimum
3. Learning proceeds faster when the threat to the self is low
4. Self-initiated learning is the most lasting and pervasive.

This theory was applicable to this study because virtual education offers a learning opportunity. In order to make virtual education meaningful to the learner, self-initiated learning strategies should be employed. The learner should participate fully in the process of learning and have control over the learning process. University management and teachers should only facilitate this process by providing the right facilities to the learners and equipping them with relevant access skills.

Learners with visual impairments also have similar educational needs as their sighted counterparts. They should therefore be able to access all modes of study independently. The right equipments should be provided to them, adaptive technology as well as information retrieval skills and skills on the use of adaptive technology. By doing this, the external threats to accessing virtual education are minimized.

**Literature Review**

The use of the internet is an essential part of day-to-day life. This has two implications for people who are visually impaired or blind. First, access to the internet using contemporary technology may present barriers, thus excluding them from fully contributing in society. Second, once accessibility barriers have been overcome, the internet offers a quick access to information (e.g. electronic versions of newspapers, job application as well as academic materials). For these reasons, there has been a great deal of research into how people with visual impairments access the internet, what they use the internet for and the barriers that they face (Hewett, Torgerson, and Douglas, 2014).

The increasing provision of Web-based information resources has moved from a simple text interface to dynamic and interactive designs. While this move has provided people with a more creative and flexible experience; there are dangers that some people will be excluded because they cannot use standard methods of access. Research has shown that people with disabilities are most at risk of being excluded from access, and in particular people who are blind or visually impaired and who use assistive technologies such as screen readers (Brophy and Craven, 2014). With initiatives such as the Millennium Development Goals and Education for All by the United Nations (United Nations, 2011), learning materials must be available as open education resources to achieve the goals. A study by Brophy and Craven (2007) notes that the accessibility of Web-based information can be improved in two principal ways: through the use of access technology and through adopting good practice in interface design.

With the rapid development of information technology and near-universal access to the Internet, people are increasingly doing more of their reading and information gathering on computers than in printed books (Chia-chen & Chen, 2014).

An extensive search produced only one study on the information behaviour of students with visual impairment. Saumure and Given (2004) as cited in (Dermody, 2011) indicated that information seeking behaviour of students with visual impairment required additional time to ensure the material was accessible.

Various studies indicate that students with disabilities experience unique challenges when accessing library resources (Riley, 2002; Byerley and Chambers, 2002; Coonin, 2002). Students who rely on screen readers experience barriers accessing information due to their rich graphical interfaces and complex web designs of proprietary online databases (Horwath, 2002). Bowman (2002), and Byerley and Chambers (2002) tested the accessibility of specific electronic databases with screen reading software and found they were not user-friendly. Horwath (2002) surveyed users who were blind or visually impaired on the usability of four databases and found that the design had the greatest impact on the accessibility of the databases. Byerley and Chambers (2002) examined the accessibility of two databases (OCLC First search and Expanded Academic) by blind students using screen readers. Web content accessibility guidelines were used as a measurement of accessibility. They found again that design elements in both databases compromised the accessibility of the databases (Dermody, 2011).

A study by Byerley, Chambers and Thohira, (2007) examined the accessibility of online databases from the database vendors’ perspectives. They found that vendors rated their products as mostly accessible. The study determined that although most vendors test their products for accessibility, only a few conducted
usability tests with persons with disabilities using adaptive technology. This study from the vendor's perspective influenced the authors to conduct their own test using students with print disabilities.

Technology is both an enabler and a barrier for students with print disabilities. While screen readers enable students to navigate their on-line environment, they are limited on how they can interpret a busy website. While database and website design is evolving to the benefit of users who have vision, the contradiction is that their enriched features which create greater accessibility to information also creates barriers for students who rely on screen readers (Dermody, 2011). According to Dermody, database vendors are aware of the barriers their databases pose to students who rely on screen readers. The study by Byerley et al., indicated that only five of the 12 vendors (EBSCO, Elsevier, JSTOR, LexisNexis, ProQuest) surveyed conducted usability testing with people who have visual disabilities. However, Byerley et al. (2007) indicated in their study that vendors are not addressing accessibility in their marketing efforts.

Assistive technologies used by individuals who are blind are costly and accessible materials, such as popular books and textbooks, are slow to be developed (Stephanie, Laurie, and Maatta, 2014). In their study, they asserted that without accessibility features, including voice-over or text enlargement, these e-readers are rendered inaccessible for individuals who have low or no vision.

In another study (Dermody, 2011) the students were forced to abandon articles because of technological barriers and this limited the amount of resources they could use to write their assignments. Only the intervention of a librarian or peer would have allowed them to continue in locating the full text and reading the article. Their self-efficacy as independent learners is challenged every time they encounter an unreadable PDF or take up to eight hours to find four articles.

Methodology

Research Design: The study adopted a descriptive survey research design.

Variables: The dependent variable was the access to virtual education. The independent variable was use of adaptive technology. Use of adaptive technology was investigated and its influence on access to e-resources/virtual education established.

Study location: The study was conducted in Kenya at Kenyatta University. Kenyatta University was purposively selected since it had the largest population of students with visual impairment compared to other public and private university with virtual learning platforms.

Target population: All learners with visual impairment in Kenyatta University and staff members who served or offered information literacy skills to the users with visual impairment. There were 80 learners with visual impairment and 5 staff members serving them.

Sample size: For the purpose of external validity of this study, all the 80 learners with visual impairment who used KU library and all the 5 staff members who served them formed the sample of this study.

Sampling techniques: Purposive sampling technique was used to select all respondents for this study.

Research instruments: A questionnaire with both open and close-ended questions was used to collect data from learners with visual impairment while a structured interview was used for the staff.

Validity: content validity was achieved by ensuring that the research instrument adequately covered the area being studied. This was done through expert judgment technique. Construct validity was achieved by ensuring that all the terms used were operationally defined.

Reliability: To ensure reliability, the questionnaires were pre-tested. It was administered twice with a time span of two weeks to 4 students with visual impairment who were purposively selected from Kenya Institute of Special Education, a location that was not used during the main study and Spearman rank order of correlation coefficient (Rho) was computed to determine the correlation between the results of the two administrations of the questionnaires. The reliability coefficient that was obtained from the pilot study was accepted since it attained a coefficient (0.75) which the researcher considered reasonable based on Orodho (2009).
Data collection technique: For the questionnaires, personal administration with on-the-spot-collection method was used. Using a recorder, the researcher herself conducted the interviews.

Data analysis: Both quantitative and qualitative methods were used to analyze the collected data.

Study Findings

Table 1: Enrolment rate

<table>
<thead>
<tr>
<th>Mode of study</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time</td>
<td>50</td>
<td>69.44</td>
</tr>
<tr>
<td>School based</td>
<td>15</td>
<td>20.83</td>
</tr>
<tr>
<td>Part time</td>
<td>3</td>
<td>4.16</td>
</tr>
<tr>
<td>Virtual learning</td>
<td>2</td>
<td>2.77</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100</td>
</tr>
</tbody>
</table>

The study found out that most of learners with visual impairment are enrolled for the full time mode of study and others in the school based mode of study. Evening classes and virtual learning registered the least number. The two students registered in the virtual school during the time of the study had low vision while totally blind students were nil.

Ease in using e-learning website

This was based on that fact that some of the courses are offered online for students in all modes of study. The students were asked to indicate the ease with which they are able to access and use the e-learning website. They were given a statement that 'I am able to find everything I need from the e-learning website' and were required to indicate whether they strongly agreed, agreed, were uncertain, disagreed or strongly disagreed to that statement. The findings were as presented in Table 2.

Table 2: Ease in using e-learning website

<table>
<thead>
<tr>
<th>It is easy</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>3</td>
<td>4.2</td>
</tr>
<tr>
<td>Agree</td>
<td>15</td>
<td>20.8</td>
</tr>
<tr>
<td>Uncertain</td>
<td>12</td>
<td>16.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>34</td>
<td>47.2</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>8</td>
<td>11.1</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100</td>
</tr>
</tbody>
</table>

As indicated in Table 2, majority of the students (47.2 per cent) disagreed with the statement. It was therefore clear that the library website was not very accessible to users with visual impairment. This could be attributed to the design of the website or lack of good orientation in accessing the library website, where important information about the library collection can be found.
A study by Brophy and Craven (2014) also found out that users with visual impairments face the challenge of web inaccessibility. The information provided on screen must be presented in a way that can be interpreted by any kind of access technology. This is what is referred to as "accessible Web design," "design for all," or "universal design." (Brophy and Craven, 2014). For instance, the advances in Web 2.0 and the new virtual learning environment does not always take into consideration whether or not it is compatible with the assistive technology students rely on (Dermody and Majekodunmi, 2011). It is, therefore, important for web designers to take into consideration all categories of users, including those with visual challenges, when designing websites.

**Ease in using e-resources in virtual education**

This was based on the fact that students in full time and school based modes of study also access e-resources from the library. In order to establish whether the students with visual impairments found it easy to use e-resources or not, the researcher posed a statement that “it is easy to use e-resources” and the respondents were asked either to indicate the level at which they agreed or disagreed to the statement. Their responses were as presented in Figure 1:

**Figure 1:** ease in using e-resources in virtual education

The findings indicated that more than half of the students engaged in the study either disagreed or strongly disagreed to the statement that ‘it is easy to use e-resources’. Specifically 52.8 per cent which constituted more than half of the sampled students indicated that it is not easy to use e-resources. This finding could be attributed to inaccessible web designs, low literacy levels in using electronic resources, lack of knowledge in using assistive technology and lack of motivation in using e-resources possibly caused by the above factors. However, a small but significant number of students indicated that it was easy for them to use e-resources. This is a good indicator to the library management that it is possible for the library users who have visual challenges to use electronic resources and that those who are not able to use them can be facilitated and supported once their challenges of access are known.

The findings of this study suggest that there are various challenges facing students with visual impairment when accessing e-resources, such as technological barriers as well as personal barriers. In a study carried out by Dermody (2011) the students were forced to abandon articles because of technological barriers and this limited the amount of resources they could use to write their assignments.
Challenges of accessing e-resources in virtual education

The main objective of this study was to establish the challenges that face learners with visual impairment with the aim of providing information to policymakers in order to formulate better strategies in dealing with the challenges. The students were asked to list the challenges that they faced when accessing electronic resources. The findings were as presented in Table 3.

Table 3: Challenges of accessing e-resources

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate computers</td>
<td>22</td>
<td>30.7</td>
</tr>
<tr>
<td>Inadequate skilled staff</td>
<td>10</td>
<td>13.8</td>
</tr>
<tr>
<td>Lack of AT skills</td>
<td>28</td>
<td>38.9</td>
</tr>
<tr>
<td>Lack of training on e-resources</td>
<td>12</td>
<td>16.6</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100</td>
</tr>
</tbody>
</table>

From the Table 3, the findings reveal that there are various challenges for learners with visual impairments in accessing e-resources. These challenges are common to many learners with visual impairment who use the Post Modern Library. The information extracted from the data above can be used by university librarians and policymakers in designing strategies to overcome the challenges that cut across several users even before addressing the more specific challenges as brought out in the findings as per objective 3 and 4.

The staff serving in the section were also asked about the challenges that they experienced while serving students with visual impairment, specifically when accessing e-resources. Their responses are as presented below:

1. Many students do not have basic computer skills thus forcing the staff to spend much time with a single student retrieving the e-resource for him/her.
2. Inability of a staff to demonstrate the processes that they explain to the users through assistive technology. For example when offering user education on access to e-resources.
3. Lack of assistive technology skills that can facilitate better assistance to students when accessing e-resources.

Research has shown that people with disabilities are most at risk of being excluded from access, and in particular people who are blind or visually impaired and who use assistive technologies such as screen readers (Brophy and Craven, 2014). The findings of this study shows some agreement with various studies which indicate that students with disabilities experience unique challenges when accessing library resources (Riley, 2002; Byerley and Chambers, 2002; Coonin, 2002). Therefore, it is true that students with visual impairment face challenges when accessing e-resources. Ability to show the specific challenges faced by the library users who have visual challenges will act as a reference point for library management in ensuring provision of support to this category of users especially when accessing e-resources which could benefit the users once high independence levels of a user is achieved.
Suggested solutions

The researcher sought to find out from the sampled library users their suggestions to dealing with the challenges that they had listed in Table 3. Their responses were as presented in the Table 4.

Table 4: Suggested solutions by students to the challenges of accessing e-resources

<table>
<thead>
<tr>
<th>Suggested solution</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase the number of computers with AT</td>
<td>26</td>
<td>36.1</td>
</tr>
<tr>
<td>Training organize training sessions for students with VI on e-resources</td>
<td>15</td>
<td>20.8</td>
</tr>
<tr>
<td>Internet connectivity</td>
<td>10</td>
<td>13.9</td>
</tr>
<tr>
<td>Conduct staff induction on AT</td>
<td>10</td>
<td>13.9</td>
</tr>
<tr>
<td>Increase staff</td>
<td>7</td>
<td>9.7</td>
</tr>
<tr>
<td>Upgrading of screen reading programs</td>
<td>4</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From Table 4, the sampled students suggested various solutions to the challenges that they had indicated in Table 3 earlier. From these findings, it is clear that access to e-resources can be improved mainly by ensuring adequate provision of computers fitted with assistive technology, conducting organized and frequent trainings on how to access e-resources, improving internet connectivity and conducting staff induction on adaptive technology. Library management should therefore consider the above suggestions for improvements in access to e-resources by students with visual impairment since they are directly gathered from this specific category of users.

During the interview, the staff serving users with visual impairment in the library were also asked to suggest solutions that they thought would be of help in improving access of e-resources to users with visual impairment. The findings were as indicated below:

1. Organizing meetings with students in order to understand better their information needs as well as get an avenue of knowing the specific challenges that they face while trying to access various informational resources with e-resources being part.
2. Benchmarking in other advanced institutions on retrieval of e-resources by specific categories of users.
3. Offering training to the students on access to e-resources.
4. Provision of enough facilities like computers and assistive technology programs.
5. Ensuring staff motivation.

It is evident that there are possibilities of improving access to e-resources. These findings are in agreement with that of Brophy and Craven (2007). In his study, the researchers note that the accessibility of Web-based information can be improved in two principal ways: through the use of access technology and through adopting good practice in interface design.

Conclusion and Recommendations

The study concluded that there were impediments to the participation of learners with visual impairment in virtual education. The main challenges were low skill levels in AT for both staff and students, low literacy levels in accessing e-resources and inaccessible websites.

This study recommends advocacy for and facilitation of learners for learners’ initiative where learners who are knowledgeable in the use of AT on the e-platform can assist others during their free time. The study further recommends that the university management organizes training and induction forums for staff on AT and e-resources. This is because both areas are dynamic and important to learners.


Dermody, K. (2011). Online databases and the research experience for university students with print disabilities. doi:10.1108/0737883111116976


Kleynhans, S. A., & Fourie, I. (2013). Ensuring accessibility of electronic information resources for visually impaired people: The need to clarify concepts such as visually impaired. doi:10.1108/LHT-11-2013-0148