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RESEARCH PAPER

DETERRENT LIBRARIES: DENYING PERSONS WITH DISABILITY

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ABSTRACT
The 2030 Agenda for Sustainable Development which aims at the eradication of poverty by 2030 has as its fourth goal the need to ensure inclusive and equitable education for all. Nonetheless, less than two per cent of Persons with Disabilities (PWDs) in Ghana are able to attain higher education. The purpose of this study was to ascertain whether libraries, which are major components of Higher Education Institutions, are physically accessible to even the limited number of PWDs in such Institutions. This study was undertaken in 2015 using the Kwame Nkrumah University of Science and Technology, Kumasi (KNUST) in Ghana as a case study. A mixed method approach was used that involved a desk study, interviews and a physical audit of the KNUST Library System using a checklist developed from international accessibility standards. In all, 16 libraries were assessed. The study concluded that the libraries at KNUST were generally not physically accessible and this served as a deterrent to PWDs in their academic pursuits. Recommendations which include the need for retrofitting the libraries were made to help make the libraries accessible and in consequence help toward the attainment of the 2030 Agenda for Sustainable Development with respect to Ghana.

Keywords: *Accessibility, Higher Education Institutions, Libraries, Persons with disabilities (PWDs), Universal design principles*

INTRODUCTION

The social model of disability posits that disability is a result of barriers to access that society places in the way of people (World Health Organization, 2011). As a result of this, inclusive environments have been proposed to be a major aspect of the post-2015 development agenda (United Nations, 2013). In this vein, the 2030 Agenda for Sustainable Development, which aims at eradicating poverty, has set as one of its goals the need to ensure inclusive and equitable education. This involves among other things, the need to ensure inclusive built environments in Higher Education Institutions

(HEIs). Inclusive built environments result from universal design principles. The term Universal Design was coined by R. L. Mace to describe the concept of designing all products and the built environment to be aesthetic and usable to the greatest extent possible by everyone, regardless of their age, ability or status in life (Center for Universal Design, n.d.). Article 2 of the Convention on the Rights of Persons with Disabilities (CRPD) (United Nations, 2006) adds that it is without the need for adaptation or specialised design. Such designs enable independent and equal use (Sawyer and Bright, 2007).

Education of Persons with Disabilities (PWDs) has been established as one of the critical ways to break the vicious cycle of poverty because of the link between education, poverty and disability (Gibilisco, 2010). The built environment has also been identified as one of the critical aspects for successful education (Vidalakis *et al*., 2013). In Ghana, however, less than 2 % of PWDs have access to education beyond the second cycle or high school level (Ghana Statistical Services, 2013). The built environment of educational institutions has also generally been identified to be inaccessible to PWDs (Hamzat and Dada, 2005; Fidzani *et al*., 2013; and Ashigbi *et al*., 2015). Nonetheless, there is little known about University libraries in this regard. The information on libraries is usually subsumed under the general university built environment. The objectives of the study were to undertake a physical audit of the KNUST library system using international accessibility standards and ascertain the perspectives of PWDs on the accessibility of the libraries. This paper was deemed necessary because libraries are a very important part of HEIs and the study will fill the identified knowledge gap. Consequently, enhancing physical accessibility in libraries will contribute in no small way toward the achievement of the Sustainable Development Goal (4) in Ghana.

LITERATURE REVIEW

The Disability Report of the World Health Organization (WHO) Secretariat (WHO, 2013) notes that there are more than one billion people with disabilities in the world. This is about 15 % of the world's population. What is striking is that this percentage has been growing from an earlier estimate of 10 % and is expected to increase. Persons with Disabilities (PWDs) include those traditionally seen as disabled like wheelchair users and others who experience difficulties in functioning due to health conditions and old age. According to the United Nations, PWDs are not to be discriminated against or unduly handicapped by the actions and inactions of society (United Nations, 2006). States Parties like Ghana that have ratified the CRPD are enjoined to take necessary steps to ensure non-discrimination and equity. One of the areas of concern has to do with education. Article 24(1) of the CRPD notes that:

> *"States Parties recognize the right of Persons with Disabilities to education. With a view to realizing this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all levels"*(United Nations, 2006).

This is seen to be in the right direction because a positive symbiotic relationship has been established between disability and poverty (Graham *et al*., 2013). This notwithstanding, educating the PWD has been acknowledged as a viable means to change the plight of the PWD (Lamichhane and Okubo, 2014). The 2030 Agenda for Sustainable Development, unlike its predecessor the Millennium Development Goals (MDGs), accordingly makes specific provisions for PWDs. PWDs are mentioned 11 times in the Sustainable Development Goals (SDGs) and implicitly six times by way of mentioning persons in vulnerable situations which include PWDs. There are seven targets that specifically refer to PWDs (UNDESA, 2015). One key area in the SDG 4 states:

"build and upgrade education facilities that

are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all."

The barriers spoken against by the proponents of the social model of disability include inaccessible built environments (WHO, 2011). Accordingly, the European Commission (2003) posits that accessibility is a concern for everyone and that it is a key to sustainable development and a necessity for social inclusion. It is the degree to which an environment, service, or product allows access by as many people as possible, in particular PWDs (WHO, 2011). According to Goldsmith (1997), the European concept of accessibility is a result of a request from the European Commission made in 1987. The concept is based on the following universal design principles:

- The objective is the provision of environments that are convenient, safe and enjoyable to use by everyone, including PWDs,
- The principles reject the division of the human population into able-bodied and disabled people,
- Universal design includes supplementary provision where appropriate.

Sawyer and Bright (2007) also present seven universal design principles which incorporate the above as follows: equitable, flexible, simple and intuitive, perceptible, tolerance for error, low physical effort and appropriate size and space for approach and use. Universal designs have been described as a process that increases usability, safety, health, and social participation, through design and operation of environments, products, and systems in response to the diversity of people and abilities (WHO, 2011). This implies that the built environment of educational institutions needs to be accessible and for that matter inclusive. Nonetheless, several studies have shown that the contrary is the case (Hamzat and Dada, 2005; Fidzani *et al*., 2013; and Ashigbi *et al*., 2015). The authors cited identified physical access challenges with the built environments of HEIs within and outside Ghana. Gibilisco (2010) nevertheless in a statement attributed to the former US President Barack Obama notes that;

"We need to build a world free of unnecessary barriers, stereotypes, and discrimination. Policies must be developed, attitudes must be shaped, the buildings and organizations must be designed to ensure that everyone has a chance to get the education they need and live independently as full citizens in our communities."

There is not much known when it comes specifically to the physical accessibility of libraries even though libraries are a very important factor for teaching, learning and research within HEIs in Ghana and the world over to some extent. Recent studies (2011-2016) that relate to libraries on the Kwame Nkrumah University of Science and Technology Institutional Repository (KNUSTSpace) for instance addressed issues like time keeping, library resources evaluation, open access and newspaper management networking. Many of the papers touched on Information Technology (IT) which is good for libraries, but none specifically addressed the barriers to physical access. Nonetheless, the CRPD in Article 30 and Ghana's Disability Act (Act 715) demand that PWDs should have equal access to libraries. Section 22 of Act 715 specifically states that:

"a public library shall as far as practicable be fitted with facilities that will enable persons with disability to use the library."

Sections 6 and 7 also require that services provided and places accessed by the public should have facilities that would enhance PWD access. The transitional provisions of the Act which was enacted and gazetted in August 2006 also noted that existing public buildings, which included libraries, ought to be made accessible within 10 years of the commencement of the Act.

Much of the literature that addresses issues pertaining to libraries that are relevant to the current study are foreign. Heaven (2004) in her study on higher education libraries in the UK concluded that with financial challenges faced by students and parents, significant barriers to accessing higher education would be created if institutions fail to make adequate provisions for PWDs. Joint (2005) noted that improvements in IT-based access technologies in the UK had improved access to library services to PWDs (though not physical access to the libraries which the current study focuses on). McAulay's (2005) study of three PWDs indicated that there had been improvements as a result of refurbishment works in a UK University library. An area of concern that was raised by her study was the unfriendly nature of the stairs. Charles (2005) in the UK emphasised on disability awareness training for library staff. She further noted the key role of person–first approaches in addressing disability issues in the libraries. Todaro's (2005) study of libraries in Argentina found out that they had accessibility challenges. Areas of concern for persons with visual impairment and those with physical challenges included the stairs and building entrances.

To overcome physical barriers in academic libraries in Greece, Koulikourdi (2008) found out that elevators were the most used device. This was followed by ramps. O'Neill and Urquhart (2011) undertook a study of academic libraries in Ireland and recommended further training for library staff on disability issues and the disability legislation. Howe (2011) conducting a mixed method study that used on-site observation and semi-structured interviews in 8 HEIs in England indicated that none of the HEIs visited were able to provide data on numbers of students with disabilities. With respect to physical space, the study found out that most institutions had buildings that were easy and safe to access and use. One area which performed quite low in accessibility was the sanitary accommodation. Wheelchair access was comparatively very good. It was also noted that though there was signage, there were differences between what was in the institutions and what was expected as standards for persons with visual impairment (Howe, 2011). Bodaghi and Zainab's (2013) study of seven public and seven university libraries in Zanjan province, Iran concluded that minimum physical accessibility standards were met but there was room for improvement. These standards provide information on how an accessible environment ought to be. Architects involved in the study were of the view that there were challenges with the provision of parking, interior layout of libraries and ramps where the expected standards were not met. The PWDs also identified parking space, exclusive space and ramps as being most unfriendly in accessing libraries. These studies give credence and affirm the need for the current study at KNUST, Ghana.

Ghana ratified the CRPD in 2012 to commit itself to guaranteeing the rights of PWDs. The 1992 Constitution of the Republic of Ghana also guarantees the fundamental human rights of all persons including PWDs. These include the unfettered right to education. However, the Ghana's main enabling legislation on disability is the Persons with Disability Act (Act 715). It has 60 sections under the following headings: Rights of persons with disability (Sections 1-8), Employment of persons with disability (Sections 9-15), Education of persons with disability (Section 16-22), Transportation (Section 23-30), Health-care and facilities (Section 31-35), Miscellaneous Provisions (Section 36-40), Establishment and functions of National Council on Persons with Disability (Section 41-50), and Administrative and financial provisions (Section 51-60). Ghana only had a draft accessibility code at the time of this study called Accessibility Standard: Design for all, Designing to improve accessibility – Draft 2 GSAD**.** In December 2016, the Ghana Standards on Accessibility Design (GS 1119) was launched in Accra. It provides standards to be applied during the construction, designing and alteration of all buildings for public use. Among others, it provides specification on how buildings and roads should be designed**.** Some other accessibility standards that are known internation-

ally include the 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design, the British Standards Institution of 2010 (BS 8300:2010) and the Design Manual for a Barrier Free Environment (Solidere, 2004). All these provide guidelines on how the built environment should be in order to be accessible to PWDs. They cover both the external environment and the internal spaces. In the absence of a substantive Accessibility Standard for Ghana, some professionals in the built industry in a bid to make the built environment accessible subjectively use aspects of some of these international standards for their activities in Ghana (Danso and Tudzi, 2015).

METHODOLOGY

The study adopted a mixed method approach on the purposively selected Library System at the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana. It involved a desk study, interviews and the use of a checklist developed from the Solidere (2004), ADA Standards (2010) and BS 8300:2010 to audit the libraries. In the absence of comprehensive PWDs related data at KNUST, the snowball approach was used to identify students with disabilities for their perception on the physical accessibility of the University Library System. In all 12 students with disabilities willingly availed themselves for the study. Based on the categorisation by the Solidere (2004), one was a student with visual impairment, one was a wheelchair user and the rest were students with limited walking abilities. There was none from the other two categories namely those with partial visual impairment and those with hearing impairment. The information sought for was their views on the friendliness of the University Library System in terms of physical access. A key informant was purposively selected to participate in the study. He was an experienced member of staff of the library system with expert knowledge in disability issues. He had a challenge with walking. He was to provide further insights into the University's Library System on how friendly or otherwise it was to PWDs in terms of physical access. The data was manually coded and analysed. Content analysis was predominantly used. All the libraries on the main campus of the University were surveyed. Two of the libraries were purposely built while the rest occupied spaces within buildings in the Colleges that also provided accommodation space for other uses like offices and lecture theatres. (Table 1). Using the checklist, the operational parameters of the libraries were assessed as being compliant, non-compliant or not applicable. The study was undertaken in 2015. Pseudo names were used for the analysis for ethical reasons.

Study site

The Kwame Nkrumah University of Science and Technology (KNUST) started as a College of Technology in 1952 and was subsequently converted to a full-fledged University in 1961. In a quest for greater academic and administrative autonomy, the University was compartmentalised into six Colleges in 2005 namely Agriculture and Natural Resources; Art and Built Environment; Engineering; Health Sciences; Humanities and Social Sciences; and Science. In 2016, its Institute of Distance Learning was also elevated to College status. The University's main campus in Kumasi where the Colleges can be found occupies a space of approximately sixteen square kilometres. It however has other campuses that are not covered in this study. KNUST is the premier Science and Technology University in Ghana with departments that focus on the built environment like Architecture, Building Technology, Civil Engineering, Geomantic Engineering, Land Economy etc. It is also the only University in Ghana with a Centre for Disability and Rehabilitation Studies.

Aside the Main Library the University Library System has other libraries (Table 1). The Main Library which began in 1952 is currently located in a multi-floor structure. The Faculty of Law Library also occupies three floors but all the other libraries are located on single floors with some located on upper floors of the

S. No	Libraries	Location	Year of construction, commissioning or completion	University/ College/Unit
1	Faculty of Agriculture Library	Ground floor	Before 2006	College of Agriculture and Natural Resources
2	Faculty of Renewable Natural Resource Library	Ground floor	Before 2006	
3	Faculty of Built Environment Library	Ground floor	Before 2006	College of Art and Built Environment
4	Faculty of Art Library	Second floor	After 2006	
5	Land Administration and Research Centre Library	First floor	In 2006	
6	Faculty of Social Science Library (1)	Second floor	Before 2006	College of Humanities and Social Sciences
7	Faculty of Social Science Library (2)	Second floor	Before 2006	
8	KNUST School of Business Library	Second floor	After 2006	
9	Faculty of Law Library	Basement to second floor	In 2006	
10	Department of Economics Library	Ground floor	Before 2006	
11	College of Sciences Library	Third floor	After 2006	College of Science
12	College of Engineering Library	Fourth Floor	Before 2006	College of Engineering
13	School of Medical Sciences Library	Ground floor	Before 2006	College of Health Sciences
14	Faculty of Pharmacy and Pharmaceutical Sciences Library	First floor	Before 2006	
15	Main Library	Ground to fourth floor	Before 2006	KNUST
16	Hospital Library	Ground floor	Before 2006	KNUST Hospital

buildings they occupy. Many of the buildings housing the libraries were commissioned or constructed before 2006, the year in which Act 715 was enacted (Table 1). Nonetheless, as per the provisions of the Act all buildings used by the public were to be made accessible by 2016.

RESULTS AND DISCUSSION

Audit of library facilities in KNUST

The results of the physical audit of the libraries are presented in Table 2.

Car parks and external environments of the libraries

It is required that there should be accessible parking spaces with smooth, uniform and level surfaces reserved for PWDs at parking lots and when they are not covered, should be as close as possible to the building entrances and signed with the International Accessibility Symbol (Solidere, 2004; BS 8300, 2010). However 94 % of the libraries did not have such accessible parking places. Only the Faculty of Law library had it but its access was obstructed by a high kerb. This finding on inaccessible parking agrees with that of Bodaghi and Zainab's (2013) in their study of public and university libraries in Iran where the authors discovered that the lack of parking spaces posed the most difficult problem for PWDs in accessing library buildings. It should be noted that for most people, car parks are the first point of contact on arrival at a place so PWDs are bound to suffer a lot of discomfort without them. Also, it is required that external access routes to and around buildings should be free from barriers, restrictions and other hazards to PWDs especially those with visual impairment (BS 8300, 2010; Solidere, 2004). Most (62.5%) of the libraries were located on the upper floors of buildings with no lifts and could only be accessed by staircases and steps that are barriers to PWDs especially wheelchair users and persons with visual impairment. The situation was compounded by not only the absence of tactile and other markings that could prompt the PWDs of these barriers but in some cases the staircases had open risers which could trap the feet of these PWDs.

Access routes to and around buildings are also supposed to be wide with firm and even surfaces since PWDs need generous space to move around and also since those with visual impairment are generally unsteady on their feet (BS 8300, 2010). Although the access routes to and from KNUST libraries were not friendly, they had firm surfaces with no loose material. The only exception in this regard was the Faculty of Art Library building whose car park and access route were paved with loose gravel.

To overcome changes in level outside buildings, the Solidere (2004) and BS 8300 (2010) stipulate that ramps should be provided whenever there is a change in level on pedestrian paths and in the vicinity of building entrances but PWDs, particularly persons with impaired vision should be provided with underfoot tactile markings or other types of warnings to reduce the risk of colliding with items such as bins, steps or staircases located along the access route. Only two libraries (12.5%) i.e. Faculty of Law and School of Medical Sciences (SMS) out of the sixteen libraries had ramps but none had the warning system. 63 % of the library entrances also had thresholds that were higher than 20 mm, the limit set by the Standards. High thresholds at building entrances obstruct wheelchair users and trip persons with visual impairment.

The provision for building entrances to be visually contrasted with the surroundings to enable persons with visual impairment to locate them was met in all cases. This was the only requirement in the Standards that was met by all the libraries. 69 % of entrance doors of the libraries had adequate width and could be opened with relative ease but the SMS and the Faculty of Law libraries entrance doors required exertion of some amount of force to open them. At the Faculty of Art and KNUST School of Business (KSB) libraries, the doors were kept open during working hours, hence requiring no effort to open them. To avoid exertion of force when

Table 2: Audit of the KNUST Library system

S. No	Parameter	Yes		No		NA		Total	
		No.	%	No.	%	No.	%	No.	%
1	Designated parking	1	6.25	15	93.75	0	0	16	100
2	Access route to library does not have steps and obstacles	1	6.25	15	93.75	0	0	16	100
3	Access route is firm	15	93.75	1	6.25	0	0	16	100
4	External ramp exists where there is a change in elevation	2	12.5	14	87.5	0	0	16	100
5	Timely provision of warning before external steps	0	0	16	100	0	0	16	100
6	Low entrance threshold level	6	37.5	10	62.5	0	0	16	100
7	Entrance visually contrasted with surroundings	16	100	0	0	0	0	16	100
8	Easy to open entrance door	11	68.75	2	12.5	3	18.75	16	100
9	Entrance door has visual panel	3	18.75	11	68.75	2	12.5	16	100
10	Internal ramp/ lift exists where there is a change in elevation	1	6.25	3	18.75	12	75	16	100
11	Timely provision of warning before internal steps	0	0	4	25	12	75	16	100
12	Hand rails on each side of internal steps	0	0	2	12.5	14	87.5	16	100
13	At least one carrel desk for PWDs	0	0	16	100	0	0	16	100
14	Hearing enhancement system for PWDs	0	0	16	100	0	0	16	100
15	Visual information	16	100	0	0	0	0	16	100
16	Tactile information	0	0	16	100	0	0	16	100
17	Audio information	0	0	16	100	0	0	16	100
18	Good illumination level	15	93.75	1	6.25	0	0	16	100
19	Accessible washrooms exist	0	0	16	100	0	0	16	100
20	Special room for persons with visual impairment	0	0	16	100	0	0	16	100
21	All book stacks/ facilities are accessible	0	0	16	100	0	0	16	100

opening entrance doors, BS 8300 requires all principal door entrances to be usable by PWDs and recommends power-operated doors. None of the libraries had automatic or revolving entrance doors. Heaven (2004) also found that the provision of automated doors at libraries entrances in the UK were often inadequate and attributed this to lack of funding. Most of the entrance doors (69%) had the defect of not providing a visual panel to enable people on either side to see what was happening at the opposite end. The Main and the SMS libraries had glazed doors so that was not a problem.

Internal spaces of libraries

Vertical and horizontal circulation within buildings are facilitated by elements such as lifts, steps, staircases, ramps, nature of floor surface, width of corridors and doors etc. The Standards had specifications for each of them and among others, steps, staircases and ramps are supposed to have handrails on both sides with tactile markings at the foot to warn PWDs; open risers are not permitted on staircases; lifts should serve all floors reached by the public and their door openings should not be less than 0.8 m wide; floor surfaces should be made of non-slip materials while widths of corridors and doors are to be adequate enough to admit wheelchair users and should be free from all obstacles (ADA Standards, 2010; BS8300,2010; and Soldere, 2004).

None of the 16 libraries had lifts or tactile warning systems and most of their staircases and ramps did not have handrails on both sides. Their floors were mostly finished with terrazzo and floor tiles and were generally firm and non-slippery. Widths of corridors and doors were also adequate. 12 out of the 16 libraries had level floors but the remaining four had changes in levels within the library spaces. The Main, Faculty of Agriculture, College of Sciences and the Faculty of Law Libraries had changes in levels within the library spaces that were surmounted by steps and staircases which in some cases were not complemented by ramps. Unlike most of the other libraries which were housed on single floors of multi-storey buildings, the Main Library was housed in a five-storey New Block and a four-storey Old Block that had no lifts for vertical circulation within the buildings. Also most of the remaining 14 libraries were situated on upper floors (Table 1) of their respective buildings and required the provision of lifts. Within the Faculty of Law library, the reading and discussion areas were located on the first and basement floors respectively which could only be accessed by spiral staircases. The Main library also had a spiral staircase. The spiral staircase is known to be more difficult to use even by persons without disabilities because they come with open risers which are potentially dangerous to PWDs.

From the above, it is clear that the KNUST Library System is fraught with many barriers that make movement from one place to the other very difficult for PWDs. The non-availability of lifts at KNUST libraries was contrary to the findings of Koulikourdi (2008) and Heaven (2004) who averred that most libraries in Grecian and UK universities had lifts. The current average cost of installing a lift for a five-storey building is around $80,000 and unavailability of funds to procure lifts might have accounted for the situation at KNUST which is located in a developing country. However the findings on the staircases at KNUST are similar to the findings of McAulay's (2005) UK study and Todaro's (2005) study in Argentina on the unfriendly nature of stairs in libraries in those nations. Staircases by nature are generally unfriendly to PWDs and so must always be supplemented by lifts and ramps to ease vertical circulation within buildings.

Illumination was apparently good in most of the libraries (94 %) except with the Faculty of Built Environment library which had dark patches in spite of the artificial lighting. Most of the libraries made use of artificial lighting during the day but a general observation was that the designs of some of the libraries did not take advantage of natural lighting even though they were located in the tropics. Some had to

do with the poor orientation of the buildings, small sizes of window openings and the use of window blinds/ curtains which reduced the level of natural lighting.

Signage include direction signs, signs of locality, street names and numbering, information signs, etc. that should be visible, clear, simple, easy to read and understand, and properly lit at night (Solidere, 2004). Although signage which in this study included visual information was present in all the libraries, it was far from ideal. For instance the International symbol of accessibility was totally absent from all the libraries. Even where signs were provided, the sizes of the letters were not always proportional to the reading distance and the wrong sizes and shapes of signboards were at times used. None of the libraries had Braille on their signs. Heaven (2004) also admitted that library signage was often found to be inadequate in a similar study in the UK where the libraries studied did not use Braille, tactile information or universally accepted pictograms. Howe (2011) avers that this vital component (signage) of accessible environment is relatively cheap and simple to provide and so the problem of signage at KNUST libraries cannot be attributed to lack of funds.

In their study on the University of Botswana buildings, Fidzani *et al*. (2013) found that accessible washrooms were provided and reserved with the international symbol of accessibility. Nevertheless they did not have the relevant space to allow for a lateral transfer, or grab rails. Heaven (2004) also made a similar discovery in her work on disability provision in five university libraries in the East Midlands (UK) where all toilets for PWDs were clean and functional but most did not also have the extra room for wheelchair users' manoeuvring . The findings of these studies were in sharp contrast to the situation at KNUST where only the Faculty of Law library had an unsigned accessible washroom with a ramp but with some barriers like air conditioner units located on its route. Most of the washrooms (94%) of the libraries were located outside the library premises. Some washrooms were not clean, or functional, did not have the required manoeuvrable space or grab rails and their paths were strewn with barriers.

Apart from the physical access, libraries are also supposed to provide other equipment and services for PWDs. All the 16 libraries did not have facilities for tactile and audio information. Visual information was however provided by all the libraries. Similar to Heaven's (2004) findings where none of the UK universities she studied provided hearing loops, all the KNUST libraries also failed to provide any assistive devices for students with hearing impairments. Braille facilities or special rooms for PWDs were not provided in any of the libraries although it is a requirement of most International Accessibility Standards. None of the libraries provided at least one carrel desk for PWDs. Furthermore, the requirement that all facilities and book stacks should be accessible was also not met largely because of limited manoeuvring spaces. This agrees with Bodaghi and Zainab (2013) who also found out that interior layout was a problem militating against having accessible libraries in Iran. Finally none of the libraries had a disability representative to take care of the needs of the PWDs and none of their staff attended disability awareness training.

Perspectives of the PWDS

The views of the students with disabilities and the key informant corroborated the findings from the audit. The key informant who used a Zimmer frame noted:

> "If you look at the University Library System in general, you can see that it is not friendly at all [to PWDs]. The collections [at the Main Library] are arranged in such a way that, materials that are in large quantities are found on the second, third and the fourth floors of the Library. The ground floor basically stocks materials that are borrowable. So if the person is able to get to the ground floor, he is able to borrow books. But if he wants to

> get more books that are relevant to his course then he needs to either climb to the second floor or the fourth floor. The policy in the library is that before we send a copy of a book to the ground floor where you can borrow, at least 5 copies of that title might have been in the reference area. When you go to the Research Commons, it is also located on the first floor of the library extension. And again if you want to get to the Research Commons, the staircase is even worse; very steep with terrazzo [finish]. So the possibility that the person can slip is high. Even climbing the staircase is also a problem (Adongo, *personal communication*)."

With the exception of one student, all the PWDs who were involved in the study bemoaned the state of the KNUST Library System because of physical accessibility challenges. That student was prepared to make the required sacrifices to enable him use the library facilities to complete his studies in the University even as he eagerly awaited the improvement of accessibility to the libraries. Concerning the Main library a Third Year student with disability noted:

> "I've been there once. It was just for registration that I went. When I went, there were stairs. They had to carry me. So if I need books, I ask my friends and they pick [them] for me (John, *personal communication*)."

Summing up, the key informant noted:

> "The library system is a problem. It is not friendly at all especially to the physically challenged. If you go to the College libraries for instance, most of them are on upper floors. Even climbing there is a problem and some of the staircases are so steep. So it means that they are no go areas. With a few which are located on the ground floor too, apart from the Faculty of Agriculture library, you mostly encounter some steps before getting to the entrance. [External] access to the [main] library is also a challenge (Adongo, *personal communication*)."

From the foregoing, it is evident that students who use the KNUST Library System are subjected to a lot of inconveniences. Among other things, they claim accessibility to the library system is problematic and therefore feel that they were not factored into the design, construction and use of the libraries. They consider the entire library environment hostile especially with regard to the physical accessibility where building elements such as poorly designed staircases and steps virtually prevent them from using the facilities. In some cases critical sections of the libraries are located on different floors of the same building and could only be reached by unfriendly means such as spiral staircases. This has caused some of them to give up and stopped using the libraries. Those who persist in using the library have to go through a lot of difficulties such as being carried as was in the case of John. It is noteworthy that PWDs have a lot in common with persons without disabilities. They have the same reading and information seeking behavior as persons without disabilities (Koulikourdi, 2008). Until a solution is found to the problem, the drive to increase the number of PWDs in KNUST and for that matter other universities in Ghana will remain a mirage. PWDs should be factored into all decisions of the library system if the libraries are to remain relevant since this is necessary to ensure compliance and enforcement of the Law.

The situation at the KNUST Library System is not peculiar to KNUST but similar to those pertaining in various parts of the world. In a study on 26 buildings of the University of Botswana that included a library, Fidzani *et al*. (2013) found most of the buildings to be inaccessible. In Iran, Bodaghi and Zainab (2013) surveyed 14 public and university libraries and reported that provision of access and equipment met minimum compliant standards and had room for improvements. Torado (2005) in her work on library services for people with disabilities in Argentina concluded that these li-

braries are not in a position to provide the best library services for persons with visual and physical impairments: it was seen that there were many things to correct and improve. It may be argued that lack of funds for the provision of new accessible facilities and the retrofitting of old ones account for the problem in developing countries but the situation is not different in the more developed countries. In the UK, both Heaven (2004) and McAulay (2005) in their separate studies on university libraries in the Midlands and Scotland respectively reported of students' complaints about the generally inaccessible nature of the physical environment. In Greece, Koulikourdi (2008) acknowledged barriers in the library system that lacked services to the persons with disability. She further disclosed that feedback from her study indicated that majority of the libraries surveyed did not have adequate investment and resources for meeting the rising demands of users who had impairments.

CONCLUSION AND RECOMMENDATIONS

The study has provided outcomes to indicate that the KNUST Library System does not adequately provide physical access to Persons with Disabilities (PWDs). This in effect is strategically denying PWDs physical access to this valuable component of the Higher Education Institution. Implicitly, it is further frustrating the few PWDs who are able to go beyond second cycle education to the tertiary level. A likely consequence is the undermining of the 2030 Agenda for Sustainable Development which requires among others that there should be inclusive and equitable quality education to help eradicate poverty. A very important segment of the population whose right is being trampled upon in a very subtle way in terms of physical access to library services is PWDs.

From Table 1, most of the KNUST libraries were constructed before 2006 when the Disability Act was enacted. Even for those constructed after the period, accessibility for PWDs was put on the back burner. It is therefore recommended that most of the libraries should be retrofitted to ensure that they are made accessible to a reasonable extent. For example, accessible parking lots and washrooms with appropriate directional signs should be provided. Lifts and ramps should also be provided to ease access to upper floors as had also been identified by Koulikourdi (2008) in Greece and doors should have visual panels. Assistive devices and special rooms should be provided in the libraries for persons with hearing and visual impairments. Universal designs should also be used for the construction of all library facilities in the future.

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