

## Library Ergonomic Factors as Determinants of User Satisfaction in University Libraries in South-East Zone of Nigeria

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### Abstract

*There is an interaction among work environment, tools/facilities and staff in the delivery of products and services. User satisfaction is often premised upon the manipulation of these variables. This survey is predicated on the need for a research evidence to affirm or debunk this belief in respect of university libraries in South-East Zone of Nigeria. Eleven (11) such libraries were randomly selected from federal, state and privately-owned universities. The descriptive survey design was used alongside a combination of accidental and stratified random sampling techniques. A researcher-made instrument captioned "Rating Scale for Library Ergonomic Factors in University Libraries" (i.e. LEFUL Rating Scale) was used for data collection. Four hundred and eighty-four (484 or 89.6%) of the 540 copies of the instrument administered were retrieved while data was analyzed using descriptive. Data analysis revealed that the pooled mean for variables like office space/accommodation, electro-mechanical equipment, ventilation and location surpassed the criterion of 2.5 while those of furniture and departmentalization were marginally lower. The results confirmed the existence of a influence of the ergonomic factors on user satisfaction. This forms the basis of the conclusion that ergonomic factors contribute in varying degrees to determine user satisfaction in Nigerian university libraries. The study, therefore, recommends, among other things: design of modern university libraries with ample spaces and befitting offices; provision of durable and user-friendly library furniture; installation of functional equipment and machinery and sitting of university libraries within the campus, equidistance from classrooms, laboratories and hostels.*

**Key Word:** *Library ergonomics, Information services, User satisfaction, University libraries - Nigeria.*

### Introduction

Most human activities take place in structured environments. These activities are also undertaken using specific tools, devices or facilities. Hence, the work environment and use of various tools/facilities need to be investigated to establish the extent to which they determine user satisfaction. This relationship between the worker and the environment resides within the phenomenon called ergonomics. Uwaifo (2005) pointed out that the term 'ergonomics' was derived from two Greek words, viz: 'ergo' (work) and 'nomos' (natural law). In ergonomics, there is a congruence of disciplines like biology, anatomy, physiology, psychology and engineering in an attempt to understand and address the problems human beings encounter with respect to their work-places or work environment (Penchart, 1996 & International Ergonomics Association, 2008). According to Liu (2007), the scope of ergonomics is much

broader as it encompasses those work-related factors that pose risk of musculo-skeletal disorders and recommendation to alleviate them. Unagha (2011) observed that common ergonomics risk factors are found in jobs requiring repetitive, forceful or prolonged exertions of the hands; frequent or heavy lighting, pushing, pulling or carrying of heavy objects; and prolonged awkward postures. These underline the perception of ergonomics as multi-disciplinary and multi-faceted.

The concept of ergonomics has specifically been defined by several authorities. In one of the definitions, Brookhuis, Hedge, Hendricks, Salas and Stanton (2005) saw it as 'the science of designing the job, equipment and workplace to fit the worker. It is a discipline that seeks to understand and improve human interaction with equipment, environment and system'. According to Hornby (2010), ergonomics is the study of working conditions, especially the design of equipment and furniture

in order to help people work more efficiently. The International Ergonomics Association (2008) also defined ergonomics as the scientific discipline concerned with the understanding of interaction among humans and other elements of a system. It went further to explain that ergonomics applies theory, principles, data and methods to design the workplace in order to optimize human well-being and overall system performance. Another scholar saw ergonomics as "human factor engineering" describing it as the systematic study of the relationship between people and the environment in which they work, serving as the basis for the design and arrangement of equipment, furnishings and workspaces with the aim of enhancing productivity and avoiding negative effects on safety, health, comfort and efficiency (Unagha, 2011). A careful synthesis of the excerpts above indicates that ergonomics seeks proper understanding of the workspaces in order to improve human interactions with equipment and environment.

Due to increasing research activities, the concept of ergonomics has mutated and become evident in a multiplicity of human activities. Researchers of diverse backgrounds now take turns to investigate and highlight its ramifications in different professions and occupations. As a result, the phrase 'library ergonomics' was coined in an earlier study to explain the interaction among library environment, library facilities/tools and people i.e. library staff and users (Nnadozie, 2016a). Consciously or otherwise, consideration of ergonomic factors are embedded in the design of library building, office plan, departmentalization, choice of library furniture and allied equipment, as well as layout of the general environment (surroundings) of the library. It is not only concerned with how people (especially, staff and patrons) relate with various library technologies and equipment but the impact of these facilities/devices on their health, safety, productivity and comfort. This is as much a factor in university libraries as it is in other genres of libraries, across the globe.

It is instructive that university librarianship in Nigeria has been evolving over the years. This growth is evident in architectural designs, complex organizational structure, personnel of

various backgrounds, sophisticated equipment and diverse services. Part of the changes in the administration and services of these bibliographic institutions in the country bothers on the provision, adaptation and harnessing of basic facilities to deliver satisfactory information services. Because of the complexity of the university library and its centrality in the academic and research activities of the parent institution, appreciable financial capital is invested in the procurement and maintenance of buildings and other infrastructural facilities. Much of these facilities are reported adequate during statutory verification and accreditation exercises conducted by the National Universities Commission (NUC) and other regulatory professional associations in the country (Nnadozie, 2016b). Consequently, users or patrons of these university libraries are expected to be comfortable and satisfied with the state of available resources and facilities. Given the level of efforts made to provide equipment/facilities for university libraries in the country, it becomes necessary to ascertain the extent to which specific library ergonomic factors (independent variable) determine or influence user satisfaction (dependent variable) with information services in selected university libraries in Nigeria.

### **Delimitation of the Study**

This study investigates the extent to which specific sub-constructs of library ergonomics influence or affect user satisfaction with delivery of information services in specific university libraries. These sub-constructs which constitute the independent variables investigated in this study are delimited to office space/accommodation, library furniture, electro-mechanical equipment, ventilation, departmentalization and location of the library. This explains the content scope.

The milieu of this study is South-East Zone of Nigeria while the institutions covered are universities. The study is further delimited to libraries attached to universities established by Federal and State Governments, as well as, private organizations/individuals. Presently, there are twenty-three (23) approved and operational universities within the area of this study. However, only eleven (11) of these universities were sampled. These were made up of three (3) federal-owned universities,

namely: Federal University of Technology, Owerri; Nnamdi Azikiwe University, Awka and Michael Okpara University of Agriculture, Umudike; as well as four (4) universities established by governments of Abia, Ebonyi, Enugu and Imo States. The four (4) private universities included in this survey are Evangel University, Akaeze; Godfrey Okoye University, Ugwuomu-Nike, Madonna University, Okija and Rhema University, Aba.

Only readers found in these libraries at the time of questionnaire administration and who attest to having used the libraries for at least one semester were included in this survey as respondents. This is because this cadre of library patrons was considered informed and knowledgeable enough to elicit such data as could be used to ascertain the extent to which library ergonomics determine user satisfaction in the libraries included in this survey.

### Research Questions

Answers to the following research questions have been provided in this study:

1. To what extent does office space/accommodation determine user satisfaction with information services in university libraries?
2. What is the extent to which library furniture affects/determines user satisfaction with information services in the university libraries?
3. To what extent does available electro-mechanical equipment influence/determines user satisfaction with information services in the university libraries?
4. What is the extent to which ventilation affects/determines user satisfaction with information services in the sampled university libraries?
5. To what extent does departmentalization determine user satisfaction with information services in the selected university libraries?
6. To what extent does location of the library determine user satisfaction with information services in the university libraries?

### Review of Related Literature

Scrutiny of available published reports revealed that while Unagha (2011) touched tangentially on what he referred to as "ergonomics in the library", the exact coinage "library ergonomics" was first used in a doctoral dissertation as, generally, encapsulating "the design of library environment, equipment and furniture, their impact on library staff and their services to patrons. It is not only concerned with how people relate with various library technologies and equipment but the impact of these devices on their health, safety, productivity and comfort" (Nnadozie, 2016a). A study by Mohindra and Kumar (2015) revealed that user satisfaction in academic libraries is significantly predicated on library environment. The duo of Afolabi and Abidoye (2012) highlighted the interaction of these variables stating that library services are complemented by available facilities, some of which are technology-driven. Library ergonomics, therefore, involves issues that affect the safety of library workers in relation to their workspace in the short and long terms (Brookhuis, *et al.*, 2005). According to Wang and Shieh (2006), environment and physical facilities are among the six (6) major dimensions considered for evaluating user satisfaction. In addition, Namaganda and Sekikome (2013) stated that 'library users also require conducive environment to study and undertake research'. The absence of a convenient library environment inevitably contributes to user frustration and dissatisfaction (Nnadozie, 2016c). It is evident in the foregoing that a plurality of ergonomic factors abounds in librarianship.

Researchers have identified other reasons for the increasing popularity of ergonomics. For instance, Unagha (2011) in his oft-cited book, examines the kind of work people do, the tools used and the job environment with the aim of finding the best fit between people and their job conditions. Brookhuis, *et al.* (2005) added that proper ergonomic design is necessary to prevent repetitive strain injuries which can develop over time and can lead to long-term disabilities. This is in line with the goals of human-centred design which cuts across enhancing human abilities, overcoming human limitations and fostering user acceptance

(Chandra, Ghosh, Barman & Chakravartie, 2008). Research evidence has also shown that planning a comfortable work environment which facilitates worker and organizational effectiveness is a good investment on its own (Francis & Dressel in Nnadozie, 2016a). These issues are true in librarianship as they are in other professions.

Library planners and managers must consider certain elements in the design of library buildings and other equipment (Varalakshmi, 2009). The key elements of ergonomics to consider in this regard are: work station design (chairs, work surfaces and accessories) and environment (space planning, use of colours, lighting, acoustics, air quality, thermal factors, etc) (Unagha, 2011). Liu (2007) identified other elements of ergonomic changes which might affect library operations and information services. These include: (i). Adjusting the position of computer keyboard to prevent 'carpal tunnel syndrome'; (ii). Ensuring that the heights of desks/chairs give room for feet to rest flat on floor; (iii). Learning to lift heavy objects the right way to prevent back injuries; and (iv). Using safety kits, including, helmets, gloves, etc.

The literature indicates that each epoch in the evolution of librarianship - consciously or otherwise - fashions the kind of building, environment or technology required for library operations and services. The submission of Varalakshmi (2009) in this regard revealed the following facts which have direct bearing on the concept of library ergonomics: During medieval times, the main concern was preservation of information, which required huge monumental structures. Later, preservation gave way to dissemination of information and services to the user which led to functional buildings. The era of gigantic library buildings might not last much longer. This is largely due to the increasing integration of various space-economical information technologies. Ahmad, Romle and Mansor (2015) noted that in designing and building contemporary libraries, areas of attention include; how customers/readers experience the physical environment, accessibility of materials (collection and technologies). This shift of emphasis to smaller library buildings was demonstrated in a survey in which majority of the respondents considered the

provision of high-quality buildings and associated infrastructure as 'important but not necessarily essential' while a sizable minority do not place too much emphasis on the physical state of the building (Jubb & Green, 2007). This is more so as most academic libraries and their parent institutions are going through a critical phase because of rapidly-increasing enrolments which expose the inadequacy of the available collection, stack areas and study spaces (Unagha, 2011).

Sarrafzadeh (2005) cautioned that despite the massive changes and technological advances in librarianship, the forces shaping the profession and the design of libraries are not solely technological. There are socio-cultural and economic factors that influence the size of libraries, as well as the nature of equipment and furniture found in them. That is why there is a marked difference between the library buildings and facilities found in the developed information-conscious Western nations and their counterparts in the poorer countries of Sub-Sahara Africa (Varalakshmi, 2009). Shelf space and storage limitations are crucial factors in planning library functions and services. The impact of these issues are obvious in the submission by Mavodza and Ngulube (2011) that the floor space of many academic libraries are so small and cannot accommodate the limitless number of books that constitute the collection. Other ergonomics issues that should be considered while designing a work-place are proper desks and chairs, computer cables and power chords, placement of power, general environment, among others (Irving & Higgins, cited in Nnadozie, 2016a).

Illumination (lighting) is another important aspect of library ergonomics. There are recommended levels of lighting for specific areas of the library, especially, the reading areas, staff offices, stack areas and storage spaces (Ifidon & Ifidon, 2007a). Unfortunately, lighting is very poor in most academic libraries in Nigeria (Bua & Yawe, 2014). This was buttressed in another survey which revealed that although the library environment is clean and reading carrels adequate, the library lacks effective lightening (Ikolo, 2015). This predisposes people reading or working under such insufficient illumination to eyestrains that may ultimately lead to eye disorders (Unagha, 2011). It is upon this that Nnadozie (2016c)

anchored his submission that the environment in which the library operates can define its relationship with the customers - a pleasurable environment leads to positive customer relation while the opposite is case where the environment is uncomfortable.

The twin issues of temperature and relative humidity cannot be overlooked in a discourse on library ergonomics. The study by Daisy (2006) found that library users are dissatisfied with available space and ventilation arrangements in the participating libraries. Unagha (2011) highlighted environmental issues which affect library services stating that heat and humidity encourage moth growth and insect activity while low humidity causes materials to become brittle. The unsatisfactory picture painted above has not abetted as the survey by Bua and Yawe (2014) revealed that many of their respondents complained about sundry aspects of their libraries including the nature of catalogue cabinet and shelf, ventilation, entrance areas and library location. The study by Ikolo (2015) pointed out the disappointing state of toilet facilities in several university libraries in Nigeria.

Another important factor that resides within the domain of library ergonomics is noise level - which affects both staff and readers within and around the library (Jubb & Green, 2007). The medieval perception of the library as quiet zone is gradually giving way as noise control rules are more often observed in the breach. Daisy (2006) confirmed that the noisy environment of the library is one of the reasons for which users are not satisfied with the library and its diverse information services. This is as much a direct result of the increasing invasion of the library by young people as it is the fallout of the integration of certain mechanical devices and electronic gadgets to facilitate information work (Murray, 2006). The study by Taylor (cited in Nnadozie, 2016a) found that noise-induced problems were common with respondents and that these problems were not grasped by those concerned. This is in addition to noise-generating activities and units like library-integrated coffee shop, communal areas, group work spaces, audio-visual room, etc (Jubb & Green, 2007).

Some references in the literature implicate the site or location of the library as another vital

element of library ergonomics. Basic economics teaches that location is a major consideration in the siting of any people-oriented facility (Jhingan, 1997 and Schiller, 2000). This is reiterated in Kimkay's (2012) submission that every enterprise has its ideal location, which is one of the single greatest determinants of success. Libraries are public institutions with the primary mandate to address the information needs of people who patronize their products and services. As a result, certain considerations are made before a library is situated. These considerations become more important in view of the number, complexity and widespread nature of the clientele (Okocha, Orji & Amos, 2016). Kimkay (2012) stressed the fact that an establishment relies heavily on walk-in customers as opposed to businesses that prospect must ensure that its location is very convenient and accessible. Oboko and Arokoyo (in Okocha, Orji & Amos, 2016) identified travel time and transport cost from library users' residences to be the main predictive variables for the frequency of library usage. Similarly, a historical review of six library systems in the United States of America in terms of use and effectiveness revealed that the location of libraries has strong long-term effect on library use (Koontz cited in Okocha, Orji & Amos, 2016). In yet another study, Park (2011) surveyed physical accessibility as a fundamental measure of patronage. He spotted distance as a determining factor for library use and concluded that long distance negatively affected the extent of library usage by a considerable number of registered users. Okocha, et. al, (2016) re-echoed this point adding that long distance, bad road network, cost of transportation and nearness to noise-generating activities had adverse effect on library use.

### **Significance of the Study**

The study is built on the premise that appreciable investment has been made by university authorities to provide working tools like furniture, computers and allied information-cum-electronic technologies; redesign and restructure offices and reading halls; and maintain facilities with which university libraries serve their variegated clientele. It, therefore, becomes necessary to find out if any correlation exists between

specific ergonomic factors and satisfaction of patrons with the delivery of information services in Nigerian university libraries. It cannot be argued too strongly that the outcome of this investigation would enlighten governmental authorities at various levels with those ergonomic issues that influence the quality of service delivery in the nation's university libraries.

More importantly, this study is a further attempt to bring the phenomenon of library ergonomics to the front burner. The survey of available literature revealed that the exact term "library ergonomics" is a novelty in the LIS lexicon. This assertion is based on the fact that although some scholar-librarians have produced and published library briefs recommending the quality of library space, facilities and equipment, especially, for university libraries (Metcalf in Nnadozie, 2016a; Ifidon & Ifidon, 2007a and Ononogbo, 2008), none of them used the exact term 'ergonomics' or phrase "library ergonomics". This study is therefore significant as it introduces the concept of "library ergonomics" and draws attention to specific ergonomic factors in the delivery of library services. Moreover, understanding the level of satisfaction or dissatisfaction based on the identified library ergonomic elements would prompt more investigations. Such sustained studies would generate more research-based solutions and add to the stock of published knowledge.

### **Methodology**

Descriptive survey method was used. Descriptive survey design enabled the researchers to collect and analyze data from a representative sample of a larger population that is heterogeneous in location, gender, work experience, computer literacy level and career

status at relatively low cost (Ifidon & Ifidon, 2007b). This modified Likert-scale type of instruments is entitled: *Rating Scale for Library Ergonomic Factors in University Libraries* (i.e. LEFUL Rating Scale). The face validity of the instrument was confirmed separately by a University Librarian, a Senior Lecturer in LIS and a Reader in Education Measurement/Evaluation. A combination of accidental and stratified random sampling techniques was used to select respondents from various sub-sets of users of university libraries in Nigeria. The accidental sampling method which involved elements the researcher can easily reach are included in a study while stratified random sampling technique ensured that the samples drawn cut across different sub-populations. A total of 540 copies of the research instrument were distributed in the participant-universities. This is made up of 60 copies for each federal university, while each state and private university libraries got 50 and 40 copies, respectively. The data collection, which lasted for four months (April - July, 2017), was accomplished with the assistance of volunteer staff in each library. At the end of this exercise, 484 completed copies of the rating scale (89.6%) was retrieved and used for analysis. Descriptive and inferential statistics were used for data analysis while results were presented in frequency tables. A criterion mean of 2.5 was used.

### **Research Findings**

The distribution of completed/retrieved research instruments used for this analysis is as follows: federal universities (168 out of 180 or 93.3%), state universities (175 out of 200 or 87.5%) and private universities (142 out of 160 or 88.8%). Answer to the research questions are presented in Tables 1 - 6.

**Table 1: Office Space/Accommodation as Determinant of User Satisfaction (N = 484)**

| S/N                  | Item Statement   | Mean        | SD          | Decision      |
|----------------------|--|-------------|-------------|---------------|
| 1                    | My satisfaction in the university library is determined by the good appearance of the building and its surroundings. | 2.78        | 1.00        | Accept        |
| 2                    | I derive satisfaction from the layout of office spaces in the university library                                     | 2.91        | 1.02        | Accept        |
| 3                    | The appearance of the entrance to the library determines my satisfaction in the university library                   | 3.06        | 1.00        | Accept        |
| 4                    | I feel more satisfied with the library because Heads of Departments/sections/units stay in comfortable offices       | 2.22        | 1.02        | Reject        |
| 5                    | I get more satisfactory services from senior librarians whose offices are properly furnished                         | 3.02        | 1.08        | Accept        |
| 6                    | Availability of sizeable reading halls add to my satisfaction in the university library                              | 3.23        | 0.95        | Accept        |
| 7                    | Spacious stack areas has influence on my satisfaction in the library   | 3.08        | 1.02        | Accept        |
| 8                    | Good office accommodation for support staff enhances my satisfaction   | 2.90        | 1.00        | Accept        |
| <b>Total/Summary</b> |  | <b>2.90</b> | <b>1.01</b> | <b>Accept</b> |

Source: Field Survey, 2016-2017

From the analysis in *Table 1*, it can be observed that all but one of the item statements exceeded the criterion mean of 2.5. The grand mean of 2.90 is strongly suggestive that the extent to which office space/accommodation determines user satisfaction with information services in university libraries is high. A careful scrutiny of the responses to the item statements reveals strong influence of office layout, library entrance, reading halls, stack areas and accommodation for support staff on readers' perception of the library. It is therefore evident that a strong correlation exists between the appearance of library building, size of librarians' offices and furnishing of these offices (on one hand) and user satisfaction. This affirms the result of the study by Jubb and Green (2007) where majority of the respondents placed emphasis on the physical state of the library building. The implication is that library users are more likely to receive satisfactory information services in university libraries that have adequate office accommodation for their staff and users. This could not have been otherwise considering that it is within this office accommodation that patrons receive reference/referral, circulation, reprographic, advisory, bibliographic services.

This sustains the conclusion that the office space in which library staff works constitutes a critical determinant factor in user satisfaction or dissatisfaction. The result of this study therefore supports the submission that work environment facilitates worker effectiveness and enhances customer satisfaction (Francis & Dressel in Nnadozie, 2016a; Brookhius, et al, 2005; Varalakshmi, 2009; Unagha, 2011; Bua & Yawe, 2014; Ahmad, Romle & Mansor, 2015 and Nnadozie, 2016a). This result also substantiates an earlier survey which suggested that only a minority of library users do not place much emphasis on the physical state of the library building (Jubb & Green, 2007). However, *Item 4* in the table exposes the dissatisfactory nature of the office accommodation in which senior staff in Nigerian university libraries work. The low mean rating of response in respect of that item statement suggests that this state of affair has adverse effect on user satisfaction. The interpretation is that although office space and other accommodation are determinants of library user satisfaction, majority of university libraries in Nigeria contend with the challenge of insufficient building and other accommodation.

**Table 2: Library Furniture as Determinant of User Satisfaction (N = 484)**

| S/N                  | Item Statement  | Mean        | SD          | Decision      |
|----------------------|---|-------------|-------------|---------------|
| 1                    | Comfortable chairs and reading tables enhance my satisfaction in the university library                   | 2.75        | 1.12        | Accept        |
| 2                    | I am satisfied that bookshelves in the university library are new   | 2.06        | 0.97        | Reject        |
| 3                    | I derive more satisfaction because the catalogue cabinets in the university library are properly arranged | 2.11        | 0.95        | Reject        |
| 4                    | Well-kept circulation counters/trays enhance my satisfaction in the university                            | 2.69        | 1.12        | Accept        |
| 5                    | Provision of clean display/show glasses adds to my satisfaction in the university library                 | 2.27        | 1.00        | Reject        |
| <b>Total/Summary</b> |   | <b>2.38</b> | <b>1.03</b> | <b>Reject</b> |

Source: Field survey, 2016-2017

In Table 2, respondents seemed satisfied with the chairs, reading tables and the well-kept circulation counters provided. This aspect of the result mirrors the works of Liu (2007) and Ikolo (2015) which found the state of this furniture adequate in different university libraries. However, overall displeasure with library furniture is clearly depicted in the low grand mean of 2.38. Responses to item statements 2, 3 and 5 hint at shortcomings in respect of bookshelves, catalogue cabinets and display glasses all of which give credence to claims made in earlier surveys (Unagha, 2011 and Bua & Yawe, 2014). It is therefore easy to surmise that there is need to improve on the general quality of library furniture provided by most university libraries in the country. This is

because, the inability of the pooled mean to reach the criterion of 2.5 implies that the effect of library furniture on user satisfaction with information services in the university libraries investigated is low. The deduction from this result is that whereas library furniture remains a key resource, the extent to which available furniture determines readers' satisfaction in Nigerian university libraries is insignificant. The implication is that available library furniture is inadequate. This result contracts with Irving and Higgins (as cited in Nnadozie, 2016a) which listed library furniture amongst major issues that should be considered while designing the library work place, vis-a-vis its position as a basic facility.

**Table 3: Electro-mechanical Equipment as Determinant of User Satisfaction (N = 484)**

| S/N                  | Item Statement   | Mean        | SD          | Decision      |
|----------------------|--|-------------|-------------|---------------|
| 1                    | Unavailability of computers boosts my satisfaction in the university library                       | 2.60        | 0.91        | Accept        |
| 2                    | Provision of photocopiers adds to my satisfaction in the university library                        | 3.20        | 0.98        | Accept        |
| 3                    | Shortage of scanners does not affect my satisfaction in the university library                     | 2.51        | 1.05        | Accept        |
| 4                    | Unavailability of Internet services enhances my satisfaction in the university library             | 2.16        | 1.02        | Reject        |
| 5                    | Provision of fans/air-conditioners influences user satisfaction in the university library          | 2.93        | 1.10        | Accept        |
| 6                    | The absence of stand-by generating sets does not affect my satisfaction in the university library  | 2.07        | 0.98        | Reject        |
| 7                    | Provision of kick-steps to aid book retrieval promotes user satisfaction in the university library | 2.93        | 1.06        | Accept        |
| 8                    | Availability of book trolleys promote user satisfaction in the university library                  | 2.62        | 1.04        | Accept        |
| <b>Total/Summary</b> |  | <b>2.63</b> | <b>1.01</b> | <b>Accept</b> |

Source: Field survey, 2016-2017

Table 3 indicates that most library users derive satisfaction when assorted mechanical and electronic information devices are employed to

drive the operations and services of university libraries. This is apparent in the high mean scores recorded in connection with computers,



photocopiers, scanners, fans/air-conditioners, kick-steps and trolleys. The implication is that customers of university libraries in Nigeria are more likely to obtain quality information services where the needed electro-mechanical devices are available than otherwise. This is a tip of the high extent to which available electro-mechanical equipment influence user satisfaction with information services in the university libraries surveyed. The result reported in *Table 3* counteracts the caution by Sarrafzadeh (2005) that despite the massive changes and technological advances in librarianship, the forces shaping the profession and the design of libraries are not solely technological. Indeed, technology has become a major factor that determines organizational efficiency, productivity, customer satisfaction and social relevance. It prevents repetitive strain injuries (Brookhius, et al, 2005); enhances human abilities, overcomes human

limitation and fosters user acceptance (Chandra, et al, 2008); improves the job environment (Unagha, 2011); and facilitates worker and organizational effectiveness (Francis & Dressel cited in Nnadozie, 2016).

It is equally necessary not to overlook the other subtle hint of this study concerning Internet and stand-by generating sets. The low mean rating of these electronic and mechanical resources underscores either of their poor density or operational inefficiency. The outcome of this survey in this respect buttresses another report that highlighted the low penetration of Internet in some communities (Murray, 2006). The few number of electric generators recorded in this study underlines the over-reliance of libraries in Nigeria on the epileptic public electric power supply. Both scenario cannot guarantee satisfactory information services.

**Table 4: Ventilation as Determinant of User Satisfaction (N = 484)**

| S/N                  | Item Statement  | Mean        | SD          | Decision      |
|----------------------|---|-------------|-------------|---------------|
| 1                    | Provision of wide windows has positive effect on my satisfaction in the university library          | 3.04        | 1.00        | Accept        |
| 2                    | Availability of functional fans enhances my satisfaction in the library                             | 3.01        | 1.08        | Accept        |
| 3                    | I am happier with the library when the air-conditioners function well                               | 2.89        | 1.06        | Accept        |
| 4                    | Access to natural sunlight increases my satisfaction in the library                                 | 2.86        | 1.09        | Accept        |
| 5                    | The library uses stand-by generator to improve the quality of ventilation                           | 2.09        | 1.04        | Reject        |
| 6                    | There is steady public power supply from NEPA/PHCN to aid ventilation within the university library | 1.98        | 0.92        | Reject        |
| <b>Total/Summary</b> |   | <b>2.65</b> | <b>1.03</b> | <b>Accept</b> |

Source: Field survey, 2016-2017

Participants responded positively to most of the issues that enhance ventilation and illumination in the library, to wit: wide windows, functional fans, air-conditioners and natural sunlight. This suggests that most university libraries included in this survey have the level of lighting recommended in the building designs (Ifidon & Ifidon, 2007a). Such compliance should be a thing of joy to the reader because doing otherwise predisposes people reading or working under such insufficient illumination to eyestrains that may ultimately lead to eye disorders (Unagha, 2011). In addition to increase in room temperature which inconveniences workers and readers alike, poor ventilation also has

adverse consequences on resources and facilities. For instance, heat and humidity encourage moth growth and insect activity, as well as accelerates embrittlement which leads to deterioration of library books and other documents. It also affects the functionality of some sensitive facilities, especially computers and other electronic equipment. Hence, a grand mean of 2.65 obtained in *Table 4* suggests that ventilation affects user satisfaction with information services in the sampled libraries.

However, this study contrasts the outcome of investigations by Daisy (2006), Bua and Yawe (2014) and Ikolo (2015) which revealed that library users were dissatisfied as a result of poor lighting and inadequate ventilation. The

reason for this discordance could be found in the fact that these studies were carried out outside the area of this study (South-East Zone). Nevertheless, the low mean rating for items 5 and 6 give useful insight into the challenges associated with electricity supply.

The fact is that, while public power supply in the country remains unreliable, the university libraries lack the stand-by generating sets required to augment this shortcoming. This situation can only breed user dissatisfaction.

**Table 5: Departmentalization as Determinant of User Satisfaction (N = 484)**

| S/N                  | Item Statement  | Mean        | SD          | Decision      |
|----------------------|---|-------------|-------------|---------------|
| 1                    | Establishment of branch libraries (i.e. faculty/departmental libraries) does not affect my satisfaction in the university library | 2.41        | 1.06        | Reject        |
| 2                    | Availability of reprographic unit adds to my satisfaction in the library  | 2.90        | 1.06        | Accept        |
| 3                    | Creation of reference section promotes user satisfaction in the library   | 3.06        | 0.97        | Accept        |
| 4                    | Existence of serials section/unit does not boost user satisfaction  | 2.23        | 1.08        | Reject        |
| 5                    | Creation of circulation office does not affect my satisfaction  | 2.72        | 1.13        | Accept        |
| 6                    | Provision of ICT/e-library increases my satisfaction in the library   | 2.82        | 1.08        | Accept        |
| 7                    | Provision of bindery section does not add to my satisfaction in the library   | 1.99        | 0.95        | Reject        |
| 8                    | Existence of reserved book section does not enhance my satisfaction   | 2.21        | 1.08        | Reject        |
| 9                    | The university library has a bookshop and this enhances user satisfaction   | 2.10        | 1.05        | Reject        |
| <b>Total/Summary</b> |   | <b>2.49</b> | <b>1.05</b> | <b>Reject</b> |

Source: Field survey, 2016-2017

In *Table 5*, although the grand mean of 2.49 is below the criterion, a line-by-line analysis of item statements 1, 2, 3, 4, 7 and 8 shows their influence on user satisfaction. For instance, establishment of branch (i.e. departmental, college/faculty or institute) libraries diversifies and brings information closer to the patrons. This measure has a high propensity to improve user satisfaction. The same is true of the creation of service points like reprography, serials, ICT, reserve book and bindery sections. This buttresses the position that the design of work environment facilitates organizational effectiveness (Francis & Dressel cited in Nnadozie, 2016a). It should be noted that the noisy environment of libraries has been cited among the major causes of user satisfaction (Daisy, 2006 and Okoche, et al, 2016). These incidences of noise are as much a direct fall out of the invasion of the library by people with phones and other audio devices as it is the result of poor office organization. Therefore, in planning the library office spaces and departments, care should be taken not to site noise-generating activities/services near the reading areas. Some of the noise-prone units have been identified as library integrated coffee shop, communal areas, group work

spaces and audio-visual room (Jubb & Green, 2006). It is therefore necessary that staff offices, departments and service points should be considered while designing the library building. This is in line with an earlier submission that the environment in which the library operates can define its relationship with customers (Nnadozie, 2006c). Hence, professional knowledge and practical experience disagree that departmentalization does not significantly determine user satisfaction as implied in the low pooled mean recorded in *Table 5*.

It is, however, curious that most respondents agreed that creation of circulation unit does not affect satisfaction. This is considering the centrality of charging and discharging activities in the library organizational flow-chart. Besides, since the circulation unit traditionally registers clients and support reference services, it should be easily one of the most popular arms of any functional university library. It is either the question was not understood or the available circulation service is of abysmal standard. Also worthy of note is the fact that bookshops are not considered as enhancing user satisfaction. A result of this nature suggests likelihood that

these bookshops are not affiliated to the university library. This is the emerging trend in the country as these outfits are set up as independent revenue generating units. It is therefore difficult, under this circumstance, to

establish a direct nexus between these autonomous bookshops and user satisfaction with information services provided by the university libraries.

**Table 6: Location of the Library as Determinant of User Satisfaction (N = 484)**

| S/N                  | Item Statement   | Mean        | SD          | Decision      |
|----------------------|--|-------------|-------------|---------------|
| 1                    | Sitting of the library very close to my residence increases my satisfaction  | 2.37        | 1.00        | Reject        |
| 2                    | Location of the library in a serene environment adds to my satisfaction  | 2.92        | 1.09        | Accept        |
| 3                    | Establishment of the library in a noisy surrounding does not affect my satisfaction  | 2.30        | 1.00        | Reject        |
| 4                    | Sitting the library far from classrooms, laboratories and workshops reduces user satisfaction                                      | 3.03        | 1.03        | Accept        |
| 5                    | Building the library in areas with good road network increases my use of the library   | 2.93        | 1.08        | Accept        |
| 6                    | Situating the university library in areas that are susceptible to distracting activities does not have much effect on my patronage | 2.05        | 1.00        | Reject        |
| 7                    | Sitting the library in flood-prone areas affect my satisfaction with the university library  | 2.98        | 1.08        | Accept        |
| 8                    | High cost of transportation to and fro the university library reduces the satisfaction from the it                                 | 2.87        | 1.14        | Accept        |
| <b>Total/Summary</b> |  | <b>2.72</b> | <b>1.05</b> | <b>Accept</b> |

Source: Field survey, 2016-2017

The pooled mean of 2.72 recorded in *Table 6* is above the benchmark set for this study. This result demonstrates that a strong relationship exists between location and user satisfaction. Libraries are institutions patronized by a public famous for its heterogeneity. It is for this reason that location has been identified as a foremost consideration in the sitting of any people-oriented facility (Jhinghan, 1997; Schiller, 2000 and Kimkay, 2012). The primary users of each library depend on the ownership. For the university library, the patrons come, largely, from the academic, research and administrative communities of the parent institution. Depending on the geographical size of each institution, the site of the library becomes an issue of fundamental importance. Available published researches have already hinted at several ways in which location affects patronage of public institutions (Wong & Shieh, 2006; Park, 2011; Kimkay, 2012; Namaganda & Sekikome, 2013 and Okoche, et al, 2016). As a facility created for a pluralistic community, it stands to reason that the location of the university library has direct implication on the volume and frequency of patronage of available information resources and services. For instance, it is logical for a

library sited within the campus to experience more user traffic than otherwise. Such high volume of patronage has a strong correlation with user satisfaction. This scenario makes the position of the library within the institution a major determinant of patronage. That much can be deduced from the responses which addressed domiciliary issues of "libraries in serene environment", "near classrooms, laboratories and workshops", "areas with good road network", "distracting activities", "flood-prone areas" and "cost of transportation". By virtue of this result, it has been established that the environment in which a university library is located or sited has influence on extent to which patrons are satisfied or dissatisfied.

### Conclusion and Recommendations

University administrators and managers of university libraries in Nigeria craft and implement policies aimed at providing human and material resources for the university libraries. In addition to library building, university libraries acquire basic furniture, tools, machinery and equipment. They also departmentalize their operations and, if need be, reconfigure the office spaces to enhance the delivery of information services. Proper handlings of these tasks promote service

quality. Only then can user satisfaction be achieved. Hence, the interaction of library environment, facilities/tools and staff reside within the ambit of library ergonomics. Based on the findings of this study, it is concluded that specific ergonomic factors (like office space/accommodation, furniture, electro-mechanical equipment, ventilation, departmentalization and location) determine the extent to which patrons are satisfied in Nigerian university libraries. The few dissenting voices (as shown in the low mean scores recorded in some item statements) constitute a timely reminder that certain aspects of library ergonomics should be improved upon. The following recommendations are based on the findings and conclusion of this study:

- University librarians and their management staff should be proactive and farsighted while planning the library building. Experienced architects must be hired to develop the librarians' brief (building design). This will address the issues of departmentalization, ventilation and illumination which are important factors in user satisfaction.
- There is need for pragmatism in the allocation of available spaces to take care of the multiplicity of service points. Departments should be positioned in a way that facilitates the work-flow, improves service delivery and enhance user satisfaction. Concerted effort must also be made to ensure that senior staff, especially, those manning management positions (as heads of departments, sections or units) has befitting offices.
- More durable and user-friendly library furniture should be provided in university libraries. Old and dilapidated reading chairs, study carrels, shelves, catalogue cabinets, charging trays and other pieces of library furniture should be replaced with newer strong models in order to enhance the aesthetics of the library. This will, in the long run, save cost, improve productivity and service delivery, as well as increase user satisfaction.
- Equipment and facilities in Nigerian university libraries should be made to function optimally. This recommendation is on the basis that dysfunctional facilities breed dissatisfaction and lead to resentment. These factors coalesce to reduce public perception of the library.
- Libraries should be sited within the university campus, equidistance from the core activity area like classrooms, laboratories, workshops and hostels. A library located away from the university or in areas with roads that are impassable increases the logistical and financial costs of access. Such challenges are usually reduced when the library is within the institution. Libraries should also not be located in noisy surroundings because this will affect the concentration of patrons.
- Mechanisms should be put in place to ensure adequate funding of university libraries in the country. This point is germane bearing in mind that the preceding suggestions can only be accomplished with massive injection of funds for the running of these academic libraries.

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