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Universal Design Strategies for Vocational Centers in Nigeria

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Abstract:- Vocational education involvesthe training of students for competence in specific trades or vocations.All issues that affect young people, such as access to education, employment, healthcare, and social services also affect youth with disabilities, but in a far more complex way. Studies show that the needs of youths with disabilities are strikingly similar to those of their non-disabled peers. Designing accessible infrastructure and the provision of equal opportunities for youths with disabilities enables them to participate in all aspects of youth development and are equally significant in promoting full participation and inclusion in the societies in which they reside.This paper is aimed at examining the socio-economic characteristics of students in vocational schools in selected suburbsofthe southwestern region of Nigeria to identify the peculiar design needs and considerations for people living with disabilities. Case studies and questionnaires were the research instruments. Findings revealed that the building professionals in Nigeria understand the meaning of the universal design, however, most of the buildings do not completely comply with its principles. Therefore, there is a need for sensitisations of the stakeholders involved in the development of vocational skill acquisition centers and other educational facilities.

Keywords:- *Skill Acquisition; Architecture; PublicBuildings; Universal Design Principles.*

I. INTRODUCTION

Vocational education entailsenhancing competence for a specific trade or vocation. Vocation centres are special training spaces for technical education. Technical Vocations refer to those aspects of the educational process that enhance or add to the general education curriculum. The study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding, and knowledge are deep-rooted in many occupations in various sectors of economic and social life, vocational training for persons with disabilities aims to enable them to acquire skills that are relevant to the current labour market demands. (Gyamfi, Mprah, Edusei, Dogbe& Owusu, 2015) opined that the presence of a conducive learning environment stimulates the learning process of the learners; this is also applicable to the vocational training environment. Vocational centres' users' experience is influenced by the internal and external conditions of physical facilities, learning environment, learning space design and structure, and the general functionality of learning and non-learning space.

Universal design is aimed at designing buildings that accommodate all categories of social existence.The universal design involved products and environments designedto be usable by everyone, tothe greatest extent possible, without the need for adaptation or specialized design. A study by Connell, Jones, Mace, Mueller, Mullick, Ostroff, Sanford, Steinfeld, Story, and Vanderheiden recognised seven principles of universal design to offerdirection in the design of products and environments for all. The principles include equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use. Universal design can apply to learning environments, health and wellness facilities, hospitals and healthcare, senior living, urban planning, public and commercial buildings, parks, and recreational spaces.The universal design is also applicable to architectural practice and Salmen (2011) noted thatuniversal design can change the prevailing situation in educational institutions intoa learning environment that givesusers equal opportunities tolearn, excel and attain their true prospects, despiteprevailing circumstances of age, size or physical capability.

Learning space design has largely been dictated by pedagogical assumptions with less emphasis on the user experience of learning environment design elements. Koutamanis, Heuer, andKönings (2017) posited that too often learning centres are built or rebuilt based on a pedagogical vision that has not been converted into practice, resulting in the learning environment becoming an obstacle and a means of frustration rather than an asset for the disabled users. There is the exclusion of persons living with disabilities in the design process and user focus. Fisher (2016) noted that more evidence is needed concerning the impact of learning environments to convince change in practice to match the new environments. Based on the foregoing there is a need to find a design solution to inclusive design for the disabled, especially in skill acquisition centres. This paper provides practical insights into vocational skill acquisition centres' learning and non-learning design, and the accessibility and usability of these spaces. The selected site for the proposed vocational centre design is located at km 32, Lagos-Ibadan expressway, Ibokun-Aro Town, Obafemi-Owode Local Government Area, Ogun State. The selection of the study location is to explore vocational centres outside the urban settlements which have been the focus of several studies in this regard.

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II. METHODS AND MATERIALS

A mixed method design was used to assess the relevance of vocational training being offered to persons with disabilities in three vocational training centers in Lagos and Ogun states of Nigeria. The qualitative andquantitative methods complemented each other and provided comprehensive data that offered deeper insights and understanding of the relevance of inclusive design in vocational skills acquisition centres.Bandaranayake noted that disciplines tend to be governed by particular paradigms; these are positivism, interpretivism, realism, and pragmatism. This paper adopts the positivism paradigm based on the assumption that reality is external and objective, and that knowledge is only significant if it is based on observation of this external reality and the inductive research approach is, this seeks to interpret data to address a problem or answer inquiries that are raised at the outset of the research.Data were derived from primary and secondary sources and were collected using questionnaires, and case studies.

The unit of analysis is the users of selected vocational education centres in Lagos State and Ogun State (Skill Acquisition and Vocational Isheri, Isheri, Lagos State; OluwakemiOdegbamiFilani Vocational Centre, Osiele Abeokuta, Ogun State and Skill Acquisition/Vocational Centre for People with Disability Owutu, Ikorodu, Lagos).The sample size was determined using Taro Yamane formulae (N⁄(K+N(e^2), the sample size for Skill Acquisition and Vocational Centre, Isheri, Lagos State is 182 students.for Skill Acquisition/Vocational Centre for People with Disability Owutu, Ikorodu, LagosState is 62 students while for OluwakemiOdegbamiFilani Vocational Centre, Osiele Abeokuta, Ogun State is 146 students.A total of forty--six (46) instructors were selected across the selected vocational training centres and two administrators per centre (school head and the administrative secretary).A qualitative descriptive statistical method was adopted for data analysis.

III. RESULTS

Four case studies were accessed for the study; these are Skill Acquisition and Vocational Center Isheri, Lagos; Vocational Rehabilitation Center for People with Disability Ikorodu Lagos; Mpirigiti Rural Training Center, Kamuli, Uganda and Vocational Education Center Gordola, Switzerland. Each of the case study designs was examined and the deduction is that Skill Acquisition and Vocational CenterIsheri, Lagos established in 2007 has inadequate lighting and ventilation with the availability of a fire escape but non-availability of acoustics. For Vocational Rehabilitation Center for People with Disability, the deduction is that there is considerable adequacy of lighting and ventilation and non-availability of fire escape and acoustics. Similarly, for Mpirigiti Rural Training Center, Kamuli, Uganda the deduction is that lighting and ventilation are adequate, and fire escape and acoustics are available. Furthermore, for Vocational Education CenterGordola, Switzerland the deduction is that lighting and ventilation are adequate, the fire escape is available and acoustics are non-available.

The outcome of the questionnaire administration across the selected skills acquisition centers(Skill Acquisition and Vocational Isheri, Isheri, Lagos State; OluwakemiOdegbamiFilani Vocational Centre, Osiele Abeokuta, Ogun State and Skill Acquisition/Vocational Centre for People with Disability Owutu, Ikorodu, Lagos) indicates that from the total sampled users of the selected vocational Centres in Lagos State and Ogun State, a total of 280 (67.3%) are between the ages of 18-25 years, 91 (21.9%) are 26-35 years, 23 (5.5%) are 36-45 years, 15 (3.6%) are 46-55 years while 7 (1.7%) are 56 years above (See Table 1). The gender ratio shows that male respondents are 206 (49.5%) while their female counterparts are 210 (50.5%). Furthermore, it is revealed that a total of 344 (82.7%) are single while 67 (16.1%), 1 (0.2%), 3 (0.7%) and 1 (0.2%) are married, divorced, single parent and widower respectively (Table 2). The religion of sampled respondents shows that a total of 194 (46.6%) are of Christian faith while a total of 192 (46. 46.2) are of Islamic faith and other a total of 22 (5.3%) and 8 (1.9%) are of traditional and other religious beliefs. Furthermore, the nationality type indicates that 353 (84.9%) and 63 (15.1%) are Nigerians and persons from other countries. The annual income of sampled respondents shows that about 368 (88.5%) of sampled users indicates no income while others have varied level of income.

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Age	Frequency	Percent
18-25 years	280	67.3
26-35 years	91	21.9
36-45 years	23	5.5
46-55 years	15	3.6
56 and above	7	1.7
Total	**416**	**100.0**

Table 1: Age of Respondents

Source: Author's Field Survey, 2022

Marital Status	**Frequency**	**Percent**
Single	344	82.7
Married	67	16.1
Divorced	1	0.2
Single Parent	3	0.7
Widower	1	0.2
Total	**416**	**100.0**

Table 2: Respondents' Marital Status

Source: Author's Field Survey, 2022

The educational status assessment shows that primary education (10.8%); secondary education (62.5%); Bsc(9.9%), MSc/PhD (1.2%) and other educational qualifications (15.6%) as presented in Table 3. The disability status of the sampled users of the selected vocational was examined, and the outcome shows that a total of 95 (22.8%) of sampled users have people living with disabilities (PLWD) while a total of 321 (77.2%) are people with no form of disabilities. The nature of disabilityshows that a total of 45 (10.8%) have a physical disability; 24 (5.8%) have a visual impairment; and 26 (6.3%) of the total sampled users of vocational centres with disability hearing challenges.

Education	**Frequency**	**Percent**
Primary	45	10.8
Secondary	260	62.5
BSc	41	9.9
Msc/PhD	5	1.2
Others	65	15.6
Total	416	100.0

Table 3: Educational Status

Source: Author's Field Survey, 2022

Disability Type	**Frequency**	**Percent**
Physical	45	10.8
Vision	24	5.8
Deafness/ hard of hearing	26	6.3
No Disability	321	77.2
Total	**416**	**100.0**

Table 4: Disability Type

Source: Author's Field Survey, 2022

Assessment of the level of user familiarity with universal design principles in public buildings shows that there isa varied level of familiarity with the various elements of universal design principles. Cumulatively, a total of 333 (80.0%); 361 (86.8%); 344 (82.7%); 338 (81.3%); 331 (79.6%); 362 (87.0%); 343 (82.5%); 359 (86.3%); 334 (80.3%); 339 (81.5%) and 344 (82.7%) of the sampled users across the three selected vocational centers in Lagos State and Ogun State are familiar with the elements of universal design principles while a total of 83 (20.0%); 55 (13.2%); 72 (17.3%); 78 (18.8%); 85 (20.4%); 54 (13.0%); 73 (17.5%); 57 (13.7%); 82 (19.7%); 77 (18.5%) and 72 (17.3%) indicates that are not familiar with the various elements of universal design principles as shown in Table 5. The assessment of universal design principles usage across selected study locations using mean score value shows that gender inclusiveness; security; ramp; lift chair (staircase); flooring for the blind; hand railings; adequate spacing for assistance clearance e.g., wheelchair; signages; large spaces; specialized access in walkways, parking spaces, etc. Size of the openings and circulations points e.g., passages, doorway, corridors etc. have to mean score values of 2.02, 2.24, 2.19, 2.18, 2.31, 2.29, 2.15, 2.31, 2.23, 2.22, and 2.06 respectively.

Universal Design Principles Variables	**Familiarity Level**		**Total**
	Yes	**No**	
Gender Inclusiveness	333 (80.0%)	83 (20.0%)	416
Security	361 (86.8%)	55 (13.2%)	416
Ramp	344 (82.7%)	72 (17.3%)	416
Lift Chair (Staircase)	338 (81.3%)	78 (18.8%)	416
Flooring for the blind	331 (79.6%)	85 (20.4%)	416
Hand Railings	362 (87.0%)	54 (13.0%)	416
Adequate Spacing for assistance clearance e.g., Wheel chair	343 (82.5%)	73 (17.5%)	416
Signages	359 (86.3%)	57 (13.7%)	416
Large Spaces	334 (80.3%)	82 (19.7%)	416
Specialized Access in walkways, parking spaces etc.	339 (81.5%)	77 (18.5%)	416
Size of the openings and circulations point e.g., passages, doorway, corridors etc.	344 (82.7%)	72 (17.3%)	416

Table 5: Familiarity Level Public Buildings Universal Design Principles

Source: Author's Field Survey, 2022

IV. DISCUSSION AND CONCLUSION

The age cohorts of sample users of selected vocational training centresshow that users of the selected vocational centres cut across different age cohorts and this implies the view of different age cohorts are captured in the study and this, therefore, makes the views expressed inthe study age inclusive. The sampled users across the selected vocational centres include both males and females and thus making the study gender inclusive. Hence, the issues of universal design principles utilization across the selected vocational would have views of both gender and the proposed design would further incorporate the needs of both the male and female users of vocational centres. Respondents'marital status indicates that most of the sampled users of the selected vocational centres are not married accounting for about 82.7% of vocational centres users sampled for the study and this is expected as the student population account for about 88.5% of the sampled users of the selected vocational centre for the study. Respondents cut across different religious beliefs and hence diverse religious beliefs are well considered in the study and reflected in the application of universal design principles in selected vocational centres in Lagos State and Ogun State.The educational status clearly shows thatthere is a relatively high level of literacy and this could be attributed to the nature of the study location which is educational intuitions.

As revealed from the study, some of the users are persons living with disabilities and this implies that there are some users of the vocational centres that need to be given consideration based on their disability status concerning the design and arrangement of spaces within the proposed vocational centre design. The assessment of the application of universal design principles across the selected vocational centresindicates that universal design principles elements were not utilised in the selected vocational centres for the study as all identified universal design principles scored level below 3 cut-off points.

This study provides valuable insight regarding the universal design principles elements, functionality, and the application of universal design principles in the design of the vocational centre. The study used specially selected case studies in Nigeria and outside Nigeria. Based on this study, it could be concluded that the application of universal design principles is low in the design of vocational centres in the selected vocational centre. Similarly, it could deduce that there is low consideration for persons living with disability PLWD) across the vocational centre design and this, therefore, make the vocational centre a difficult learning environment. Overall, it could be deduced that there is a low level of appreciation for the significance of universal design principles in the design of vocational centres. The results analysis of data from the case studies and selected

vocational centres in Lagos State and Ogun State forms the basis for the design of a proposed vocational centrein Ibokun-Aro Town, Obafemi-Owode Local Government Area, Ogun State.

The study recommends that the government across the three tiers of governance in Nigeria and also private sector developers of vocational learning centresshould give priority to the inclusion of elements of universal design principles in the design and construction of vocational centresfor both able-bodied people and persons living with disabilities. This focus would also enable the attainment of the broad goals of vocational and technical education in Nigeria as captured in the national education policy.

REFERENCES

[1.] Bandaranayake, T. (2012). Understanding research philosophies and approaches. Retrieved from http://www.slideshare.net/thusharabandaranayake/ understanding-research-philo
[2.] Biao, I. andTawo, R.E (2007). Psychological Principles of Adult Education; Calabar, Nigeria, Wusen Publishers.
[3.] Connell, B.R.; Jones, M.; Mace, R.; Mueller, J.; Mullick, A.; Ostroff, E.; Sanford, J.; Steinfeld, E.; Story, M.; and Vanderheiden, G. (1997). The Principles of Universal Design. NC State University, The Center for Universal Design. Retrieved from https://projects.ncsu.edu/ncsu/design/cud/about_ud/udprinciplestext.htm
[4.] Federal Republic of Nigeria (2004). National Policy on Education. Lagos; NERDA Press.
[5.] Fisher, K. (2016). Emerging Evaluation Knowledge in New Generation Learning Environments. Evaluating Learning Environments pp 165-179
[6.] Groce, N. &Kett, M., (2014) Youth with Disabilities, Working Paper Series: No. 23Leonard Cheshire Disability and Inclusive Development Centre, University College London Full Working Paper Series: http://www.ucl.ac.uk/lc-ccr/centrepublications/workingpapers
[7.] Gyamfi, N, Mprah, W. K., Edusei, A. K., Dogbe, J. A., & Owusu, I., (2015). Relevance of Vocational Training Programme for Persons with Disabilities in the Ashanti Region of Ghana. *Journal of Disability Studies*, 2015, 1(2), 69-76. ©IS Publicationshttp://www.pubs.iscience.in/jds
[8.] Koutamanis, A., Heuer, J., and Könings, K. D. (2017). A visual information tool for user participation during the lifecycle of school building design: BIM. European Journal of Education, 52(3), 295-305.
[9.] Maknun, J., Barliana, M. S. &Cahyani, D., (2019)A Design Model of Special Vocational High School for Children with Visual Impairment. *Indonesian Journal of Science & Technology*, Volume 4 Issue 2, September 2019 page 158-170
[10.] Sholanke A. B., Adelowo I. E., Gbotosho J. O. (2020). Compliance of High-rise Buildings Vertical Accessibility Components with Universal Design Strategies: A Case Study of Covenant University, Ota, Nigeria. Civil Engineering and Architecture, Vol. 8, No. 5, pp.: 735-749, 2020.