The Role of Inclusive Design in Vocational School Architecture: Addressing the Needs of Orphaned Children in Ikorodu Metropolis

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Abstract- This article examines the critical role of inclusive design in vocational school architecture, focusing on its impact on orphaned children in Ikorodu Metropolis, Nigeria. As urbanization progresses, the need for educational environments that cater to diverse needs becomes increasingly important. Inclusive design principles aim to create spaces that are accessible and welcoming for all individuals, regardless of their physical abilities or socio-economic backgrounds. This study analyzes the theoretical foundations of inclusive design, highlights successful case studies globally, and discusses methodologies for implementing these principles in vocational school architecture. By addressing the unique challenges faced by orphaned children, this research provides actionable recommendations for architects and policymakers to foster inclusive educational environments that promote skill acquisition and emotional well-being. The findings underscore the importance of integrating inclusive design strategies into vocational school projects to enhance accessibility, support social equity, and ultimately improve educational outcomes for marginalized populations.

Indexed Terms- Inclusive design, vocational school architecture, orphaned children, accessibility, social equity.

I. INTRODUCTION

Inclusive design has become a fundamental principle in educational architecture, particularly for institutions serving marginalized groups such as orphaned children. As urban areas expand and diversify, educational spaces must accommodate a wide range of abilities, ages, and backgrounds to ensure equitable learning opportunities (Yang, Yaman & Ismail, 2024). By eliminating physical, social, and emotional barriers, inclusive design fosters engagement, accessibility, and a sense of belonging in learning environments (Saraswat, 2023). In Nigeria, orphaned children face significant obstacles to education, including financial hardships, inadequate facilities, and emotional distress (Eneji & Archibong, 2020; Meli, 2020). Research indicates that inclusive educational settings improve academic performance and social integration (Ramasamy et al., 2022). Beyond physical accessibility, inclusive design addresses emotional and psychological well-being by creating spaces that encourage social interaction and foster supportive learning experiences (Kanwal & Ullah, 2022).

This paper examines the role of inclusive design in vocational school architecture and its impact on the educational outcomes of orphaned children in Ikorodu Metropolis. Through a literature review and case study analysis, the research highlights the necessity of integrating inclusive design principles into vocational schools to enhance accessibility, skill acquisition, and overall well-being.

While existing studies on inclusive design focus primarily on general school environments, limited research addresses vocational schools tailored to orphaned children. Most literature emphasizes accessibility in primary and secondary education (Saraswat, 2023; Ramasamy et al., 2022) but does not explore how vocational school architecture can support both skill acquisition and psychological well-

being. Additionally, research on inclusive design in Nigeria remains scarce, particularly in semi-urban areas like Ikorodu, where financial and policy constraints pose unique challenges (Eneji & Archibong, 2020; Meli, 2020). This study bridges this gap by analyzing inclusive design strategies specific to vocational education for orphaned children, offering insights for future school planning in similar socio-economic contexts.

II. LITERATURE REVIEW

The evolution of inclusive design in educational architecture reflects a growing recognition of social equity, human rights, and the necessity for sustainable learning environments. Historically, functionality and efficiency were prioritized over inclusivity, but contemporary approaches now emphasize accessibility and social integration as fundamental design principles (Yang, Yaman & Ismail, 2024). This shift is driven by both ethical considerations and changing student demographics, where marginalized groups, such as orphaned children, form a significant portion of the population in need of equitable education (Sani & Gbadamosi, 2022).

Inclusive design eliminates barriers to engagement and learning by creating accessible and supportive educational spaces (Saraswat, 2023). In Nigeria, orphaned children frequently face financial hardships, inadequate facilities, and emotional trauma, which hinder their educational opportunities (Eneji & Archibong, 2020; Meli, 2020). Research highlights the importance of integrating trauma-informed care and social-emotional learning into school designs, as these strategies provide essential psychological and academic support for vulnerable learners (Burt, 2023). However, the historical neglect of marginalized groups in educational planning has led to exclusive architectural practices, limiting opportunities for meaningful participation and community integration (Stafford et al., 2022).

This research examines how inclusive design principles can effectively address the unique needs of orphaned children in Ikorodu Metropolis. By reviewing successful case studies and best practices from various global contexts, this study aims to provide insights that can guide future vocational school designs toward fostering greater inclusivity and improved educational outcomes for vulnerable populations.

Although inclusive design research has expanded globally, most studies focus on accessibility in conventional schools rather than the specific spatial and emotional needs of vocational institutions. Furthermore, while developed nations provide key insights, their frameworks may not fully address Nigeria's infrastructural and economic limitations. There remains a need for localized research that examines how inclusive design can be effectively applied in vocational schools for orphaned children in Ikorodu. This study fills that gap by providing context-specific recommendations for future architectural developments.

2.1 conceptual Foundations of Inclusive and Accessible Design

In the context of vocational school architecture for orphaned children in Ikorodu Metropolis, inclusive design plays a critical role in addressing both educational and psychological challenges. Orphaned children often experience emotional trauma and social stigmatization, which can hinder their academic development and overall well-being (Eneji & Archibong, 2020; Meli, 2020). Research has shown that inclusive educational settings not only improve academic performance but also foster social integration by creating environments where marginalized learners feel supported and valued (Ramasamy et al., 2022; Akinola et al., 2019).

Beyond physical accessibility, inclusive design encompasses emotional and psychological support systems. Spaces that encourage social interaction and communal engagement contribute to a sense of belonging and empowerment among orphaned children, reducing isolation and promoting active participation in learning (Kanwal & Ullah, 2022). The integration of trauma-informed care and social-emotional learning into vocational school architecture further enhances this supportive environment, ensuring that vulnerable learners receive both academic guidance and emotional stability (Burt, 2023).

By applying these principles in vocational schools in Ikorodu Metropolis, educators and architects can create nurturing environments that facilitate academic success, emotional resilience, and long-term personal growth for orphaned children.

2.2 Inclusive Design for Orphans in Vocational School Design

Inclusive design is a critical component of urban planning, particularly in the development of vocational schools for marginalized groups such as orphaned children in Ikorodu Metropolis. Public spaces that promote social interaction and community participation play a vital role in the development of these children, as emphasized by Wan, Shen, and Choi (2021). By integrating inclusive design principles, vocational schools can ensure barrier-free access, flexible learning spaces, and safe outdoor environments that foster a sense of belonging and community engagement (Enssle & Kabisch, 2020).

While frameworks like Smart Growth advocate for mixed-use communities that enhance accessibility to educational resources and social services (Pineo, 2022), challenges such as exclusionary zoning policies and inadequate infrastructure continue to disproportionately affect marginalized populations (Tonkiss, 2020; Joy & Vogel, 2021). Despite the availability of comprehensive inclusive design frameworks, poor policy enforcement and insufficient funding remain significant barriers to implementation (Imrie & Hall, 2001). To address these challenges, Tanuja and Singh (2020) emphasize the necessity of integrating inclusive design principles from the conceptualization stage, ensuring that accessibility and community engagement are embedded within the planning process rather than treated as secondary considerations.

2.2 Inclusive Spatial Design

Inclusive spatial design is fundamental to creating environments that address the diverse needs of orphaned children, particularly in educational and residential settings. Research highlights that architectural layout promoting interaction, safety, and community engagement are essential for supporting the emotional and psychological development of vulnerable children. For example, studies on orphanage spatial organization emphasize the importance of communal spaces such as courtyards and activity areas that facilitate socialization and play, which are crucial for child development (Adeleke, 2023; Sosso Ngangue et al., 2024). These spaces are designed for flexible use, enabling children to engage in educational, recreational, and social activities.

Inclusive design principles extend beyond aesthetics to encompass functionality and accessibility. Effective facilities accommodate children with varying physical abilities through features like ramps, wide doorways, and accessible restrooms, ensuring independence and dignity (Adeleke, 2023). Moreover, inclusive learning environments are characterized by adaptable classrooms that support different teaching methods and learning styles, providing equitable access to educational resources (Saraswat, 2023). Such design considerations are vital for fostering an environment where orphaned children can thrive academically and socially.

2.3 Community and Social Integration

Community and social integration are critical components of inclusive educational programs for orphaned children. Literature underscores the role of open communal spaces that encourage gatherings, cultural activities, and collective learning, which help build social networks and a sense of belonging (Sosso Ngangue et al., 2024). Engagement with local communities through outreach and skill-building initiatives further promotes mutual support and reduces social stigma associated with orphan care (Adeleke, 2023).

Partnerships between educational institutions and community organizations are also instrumental in fostering inclusive policies and practices. These collaborations ensure orphaned children have equal access to educational opportunities and social resources, enhancing their integration into society (Kanwal & Ullah, 2022). Inclusive design in architecture supports these goals by creating spaces that facilitate interaction and participation among children, caregivers, and the broader community.

2.4 Inclusivity in Infrastructure

Inclusivity in infrastructure is essential to meet the varied needs of orphaned children. Architectural research advocates for designs that incorporate accessible features such as wheelchair ramps, wide corridors, and sensory-friendly spaces to accommodate children with disabilities or special needs (Maknun et al., 2022; Adeleke, 2023). Family-style living arrangements and small group housing models have been shown to foster intimacy, privacy, and social skills development, contrasting with traditional institutional layouts (Sosso Ngangue et al., 2024).

Furthermore, inclusive infrastructure encompasses adaptable educational facilities equipped with adjustable furniture and sensory accommodations to support diverse learners (Saraswat, 2023). Policy frameworks developed in collaboration with local authorities ensure that these infrastructures are effectively utilized to support vulnerable populations, including orphaned children (Kanwal & Ullah, 2022). This holistic approach to infrastructure design and management promotes equity, dignity, and well-being in educational settings.

III. METHODOLOGY

This study employs a qualitative research approach grounded in an extensive review of literature. The methodology involves a systematic examination of scholarly publications, policy documents, and empirical studies that explore inclusive design principles within educational architecture, with a particular focus on addressing the unique needs of orphaned children.

By synthesizing findings from existing research, the study identifies key inclusive design strategies that promote accessibility, safety, psychological well-being, and social integration for orphans in vocational school settings. These strategies include spatial configurations, sensory considerations, and supportive facilities tailored to vulnerable children.

The comprehensive analysis of literature provides an in-depth understanding of how inclusive design can be optimized in vocational school architecture to enhance educational access, emotional support, and overall well-being of orphaned children in Ikorodu Metropolis.

IV. RESULTS AND DISCUSSIONS

This study reviews seven papers on inclusive design and educational support strategies in vocational school architecture, focusing on their objectives, methodologies, and key findings. It highlights the benefits and challenges of design inclusivity solutions, particularly in addressing the specific needs of orphaned children in educational environments. By examining various strategies such as accessible spatial layouts, supportive facilities, and socio-educational interventions, the study provides insights into how inclusive design can improve educational access, emotional well-being, and social integration for orphaned children in Ikorodu Metropolis.

4.1 Summary of reviewed literature

Table 1.0: Summary of reviewed literature

S/N	Title of Article	Author(s)	Year	Aim and Objectives	Methodology	Results / Key Findings
1	Integrating critical regionalism features in orphanage design for internally	Adeleke, A.	2023	To explore how critical regionalism can be integrated into orphanage design to	Qualitative: Literature review, interviews, visual survey, spatial analysis (space syntax	Developed architectural design guidelines promoting child development via spatial organization and

	displaced orphans in Gombe			promote child development and cultural connection	method)	cultural integration
2	Social challenges to the education of orphaned and vulnerable children in Eleme Nigeria	Eneji, R. I. & Archibong, E. P.	2020	To identify social barriers affecting education access for orphaned children	Qualitative analysis of social factors impacting education	Highlighted poverty, stigma, and lack of tailored support as major challenges to orphan education
3	Enhancing educational and social support for orphaned children: A case study of SOS Children's Village Faisalabad	Kanwal, A. & Ullah, F.	2022	To examine educational and social support mechanisms for orphaned children	Case study approach	Emphasized the importance of inclusive educational environments and social support for orphans
4	Designing inclusive spaces: Investigating the role of design in creating accessible environments for people with disabilities	Saraswat, A. S.	2023	To investigate inclusive design strategies for accessibility aligned with sustainable development goals	Literature review and design analysis	Identified key inclusive design principles that enhance accessibility and user well-being
5	Provision of Vocational Skills Education to Orphans: Lessons from Orphanage Centres in Dar es Salaam City, Tanzania	Meli, B. M.	2020	To assess vocational education provision for orphans and identify best practices	Qualitative study with interviews and field observation	Found vocational education critical for orphan empowerment, recommending tailored infrastructure and support
6	Exploring Factors Associated with Educational Outcomes for Orphan and	Sinha, A., Lombe, M., Saltzman L.Y., Whetten K.	2022	To explore factors influencing educational success among orphans	Mixed methods: Surveys and interviews	Highlighted need for supportive learning environments and inclusive educational policies

	Abandoned Children in India					
7	Design Model of Special Vocational High School for Children with Visual Impairment	Maknun, J., Barliana, M.S., & Cahyani, D.	2022	To develop a design model for vocational schools catering to visually impaired children	Design research methodology	Proposed specialized inclusive design features improving accessibility and learning outcomes

4.2 Discussion on reviewed literature

The reviewed studies underscore the significance of inclusive design strategies in creating educational environments that support the diverse needs of orphaned children. Spatial organization, accessibility features, and adaptable learning spaces play crucial roles in fostering comfort, safety, and engagement. For instance, flexible classroom layouts and communal areas enhance social interaction and emotional well-being among vulnerable children (Adeleke, 2023). Incorporating accessibility elements such as ramps, wide doorways, and sensory-friendly zones ensures equitable participation for children with varying physical and cognitive abilities (Maknun et al., 2022; Saraswat, 2023).

Furthermore, community-oriented design approaches that encourage collaboration and social integration contribute to the holistic development of orphaned children (Kanwal & Ullah, 2022). Low-cost, contextually appropriate interventions, such as multipurpose spaces and locally sourced materials, improve the usability and inclusivity of vocational school facilities in resource-constrained settings (Eneji & Archibong, 2020). A synthesis of inclusive design practices demonstrates their potential to create supportive learning environments that promote educational access, psychological resilience, and social cohesion for orphaned children in Ikorodu Metropolis.

V. CONCLUSION AND RECOMMENDATIONS

The reviewed studies affirm the vital role of inclusive design strategies such as spatial organization, accessibility features, and adaptable learning

environments in enhancing the educational experience, safety, and well-being of orphaned children in vocational school settings. These design interventions contribute significantly to creating supportive and engaging spaces that accommodate diverse physical and psychological needs. The incorporation of low-cost, context-sensitive solutions, such as flexible communal areas and accessible infrastructure, highlights the practicality and scalability of inclusive design in resource-limited environments like Ikorodu Metropolis. Advanced design approaches, including participatory planning and user-centered evaluations, offer valuable insights into optimizing school architecture to foster social integration, independence, and holistic development among orphaned children.

VI. RECOMMENDATIONS

To enhance inclusive design in vocational school architecture for orphaned children in Ikorodu Metropolis, it is essential to implement universal design principles across all facilities. This involves ensuring that both new and existing school buildings incorporate features such as ramps, wide doorways, accessible restrooms, tactile flooring, handrails, and clear signage to accommodate children with varying physical abilities. Equipping vocational schools with assistive technologies, including screen readers, adaptive tools, and mobility aids, will further support students with physical and cognitive impairments, thereby improving their participation and learning outcomes. Additionally, regular training programs should be organized for educators and school staff to build their capacity in inclusive education practices, disability awareness, and the effective use of assistive

technologies, enabling them to better support orphaned children with diverse needs.

Designing flexible and multi-functional spaces is also crucial; classrooms and common areas should be adaptable to different teaching methods, learning styles, and social activities, fostering greater engagement and inclusivity. The planning and design process must actively involve stakeholders such as orphaned children, caregivers, educators, architects, and community members to ensure that the facilities truly meet the users' needs and promote a sense of ownership. Given the resource constraints often faced in Ikorodu Metropolis, it is important to develop low-cost, context-specific solutions that utilize locally available materials and simple design interventions to improve accessibility and usability without significantly increasing costs.

Furthermore, establishing inclusive policy frameworks in collaboration with government agencies and educational authorities will help enforce standards that mandate accessible infrastructure and equal access to vocational education for orphaned and vulnerable children. These policies should be accompanied by regular monitoring and evaluation to ensure compliance and continuous improvement. Finally, promoting community integration programs through the design of communal spaces and outreach initiatives will encourage social interaction, helping orphaned children build supportive social networks and reduce stigma, thus fostering a more inclusive and empowering educational environment.

REFERENCES

[1] Adeleke, A. (2023). Integrating critical regionalism features in orphanage design for internally displaced orphans in Gombe. Arts and Design Studies. Retrieved from https://www.academia.edu/37018925/integratin g_critical_regionalism_features_in_orphanage_ design_for_internally_displaced_orphans_in_go mbe

[2] Burt, K. (2023). Enhancing Elementary School Educators' Behavioral Classroom Management Strategies Through Utilization of Trauma-Informed Care (TIC) and Social-Emotional Learning (SEL). https://dsc.duq.edu/cgi/viewcontent.cgi?article= 1039&context=dnp

[3] Eneji, R. I., & Archibong, E. P. (2020). Social challenges to the education of orphaned and vulnerable children in Eleme Nigeria. Mediterranean Journal of Social Sciences, 12(4), 183-191. https://doi.org/10.36941/mjss-2021-0038

[4] Kanwal, A., & Ullah, F. (2022). Enhancing educational and social support for orphaned children: A case study of SOS Children's Village Faisalabad. https://www.researchgate.net/publication/37907 6691_Enhancing_Educational_and_Social_Sup port_for_Orphaned_Children_A_Case_Study_o f_SOS_Children's_Village_Faisalabad

[5] Ramasamy, J., et al. (2022). Empowering youth social change: Role social entrepreneurship education. https://www.researchgate.net/publication/38197 3247_Empowering_Youth_for_Social_Change_ The_Role_of_Social_Entrepreneurship_Educati on

[6] Saraswat, A. S. (2023). Designing inclusive spaces: Investigating the role of design in creating accessible environments for people with disabilities in the context of sustainable development goals. Journal for ReAttach Therapy and Developmental Diversities, 6(1), 1320-1333. https://jrtdd.com/index.php/journal/article/view/ 2600

[7] Sani, K. F., & Gbadamosi, A. (2022). Inclusion of people with disabilities in marketing: A paradigm shift. In Critical Perspectives on Diversity, Equity, and Inclusion in Marketing (pp. 75-99). IGI Global. https://www.igi-global.com/chapter/inclusion-of-people-with-disabilities-in-marketing/307251

[8] Saebones, D., et al. (2015). Barriers faced by orphaned youth in accessing education: A systematic review.

[9] Stafford, L., Vanik, M.L., & Bates, D. (2022). Disability justice and urban planning. Planning Theory & Practice, 23(1), 101-142. https://www.tandfonline.com/doi/full/10.1080/1 4649357.2022.2035545

[10] Tonkiss F. (2020). City government and urban inequalities. City,24(1-2),286-301. https://www.tandfonline.com/doi/abs/10.1080/13604813.2020.1739931

[11] UNICEF (2024). Education programs for orphans. Retrieved from https://www.unicef.org/nigeria/topics/education-emergencies

[12] Wan, C., Shen, G.Q., & Choi, S. (2021). Underlying relationships between public urban green spaces and social cohesion: A systematic literature review.City Culture and Society, 24, 100383. https://www.sciencedirect.com/science/article/pii/S1877916621000138

[13] Yang, M., Yaman, R., & Ismail, F.Z. (2024). Age-inclusive urban design: A review of sustainable retrofit strategies for elderly well-being.Journal of Infrastructure Policy and Development, 8(5), 3797. https://systems.enpress-publisher.com/index.php/jipd/article/view/3797

[14] Meli, B.M. (2020). Provision of Vocational Skills Education to Orphans: Lessons from Orphanage Centres in Dar es Salaam City, Tanzania.

[15] Okoye, R., & Arimonu, M.O.Y.A. (2019). Technical Vocational Education in Nigeria: Issues Challenges Way Forward. https://eric.ed.gov/?id=EJ1089786#:~:text=In%20Nigeria%2C%20the%20training%20of,purposes%2C%20lack%20of%20teacher%20motivation%2C

[16] Omotosho, A. (2023). The contribution of Enactus global sustainability initiative to youth empowerment and community development. International Journal of Sustainability in Higher Education. https://doi.org/10.1108/ijshe-05-2023-0208.

[17] Sinha, A., Lombe, M., Saltzman L.Y., Whetten K. (2022). Exploring Factors Associated with Educational Outcomes for Orphan and Abandoned Children in India. https://pmc.ncbi.nlm.nih.gov/articles/PMC4830269/

[18] Maknun, J., Barliana, M.S., & Cahyani, D. (2022). Design Model of Special Vocational High School for Children with Visual Impairment.

https://msaeng.journals.ekb.eg/article_309314_ee8ae7e1c6378a502899a0c8cdd54ed3.pdf

[19] Jusmirad, M., Khibran, M., Sarah, Y., Songkeng, S., Arina, A., & Makassar, U. (2023). Life Skills Education for Students with Special Needs to Improve Independence and Skills in Daily Life at UPT SLBN 2 Makassar. Jurnal Pengabdian Masyarakat Bestari. https://doi.org/10.55927/jpmb.v2i5.4181.