

Architectural Design for Autism Spectrum Disorders: Assessing Inclusive Strategies within the Nigerian Built Environment

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Abstract

Designing built environments that support individuals with autism spectrum disorders (ASD) requires inclusive design principles that address diverse sensory and cognitive needs. In Nigeria, despite growing awareness of disability rights, specific design standards for autism remain undeveloped. This study presents findings from a structured survey conducted in Lugbe, Abuja, targeting 258 stakeholders including architects, educators, parents, and government officials. The survey gathered both quantitative and qualitative data on participant demographics and their evaluation of key architectural features for a proposed autism community centre (Tables 1–3). The most commonly prioritized features included low-stimulation lighting, accessible toilets, quiet/sensory spaces, wheelchair ramps, visual signage, and a sensory room each selected by approximately 40–45% of respondents (Table 3). Notably, only one-third of participants were familiar with formal inclusive design concepts, and nearly half had no prior involvement in inclusive design projects (Table 2). These results mirror international best practices that highlight the importance of sensory control, clear wayfinding, and refuge spaces (e.g., ASPECTSS and RIBA guidelines). In the Nigerian context where enforcement of disability access remains limited this study underscores the urgent need to embed autism-sensitive design principles into national building regulations. Practically, the findings support the adoption of neuro-inclusive standards such as controlled acoustics, predictable spatial sequencing, and transitional zones to promote accessible, autism-friendly environments aligned with global accessibility frameworks.

Keywords: Autism Spectrum Disorders, Inclusive Design, Community Centre, Disability Access, Nigeria.

Introduction

Autism Spectrum Disorders (ASD) are neurodevelopmental conditions characterized by varied sensory, communication, and social challenges. Individuals with autism often experience the built environment differently for example, showing hypersensitivity to light, sound, or spatial arrangements (Tola et al., 2021). The concept of neurodiversity acknowledges this range of cognitive and sensory experiences and calls for inclusive architectural practices that support all users, not just the neurotypical majority. Neuro-inclusive design seeks to create environments that accommodate cognitive and sensory diversity by controlling stimuli, offering clear wayfinding, and providing quiet or refuge spaces (Alzheimer & Colleagues, 2022; Finnigan, 2023).

In Nigeria, persons with disabilities including those with ASD face significant environmental and institutional barriers. Although estimates suggest that 15 to 25 million Nigerians live with some form of disability, many public buildings remain inaccessible (Mbada et al., 2021). While the 2018 Discrimination Against Persons with Disabilities Act represents progress, enforcement is inconsistent, and national building codes lack clear, measurable standards for inclusive design. Specifically, no autism-focused architectural guidelines currently exist in Nigeria. This absence has left critical gaps in public infrastructure and planning for individuals with ASD. Cultural stigma and limited diagnosis further compound exclusion, especially for children, many of whom lack access to supportive environments (Chinedu et al., 2023).

Despite growing international consensus on neuro-inclusive design reflected in frameworks such as ASPECTSS™ and the PAS 6463:2022 standard Nigeria has yet to incorporate these principles into mainstream architectural policy. This study responds to that gap by focusing on a proposed autism community centre in Lugbe, Abuja, using stakeholder feedback to identify priority design features.

Research Gap and Significance

While extensive global research exists on autism-friendly design, there is a scarcity of empirical studies applying these principles in the Nigerian context. Existing disability laws provide a legal foundation, but there remains a disconnect between policy and architectural implementation, particularly regarding neurodiversity. This study is significant because it bridges that gap, offering context-specific insights that can inform future inclusive infrastructure in Nigeria.

Research Objectives

This study aims to:

1. Assess stakeholders' awareness and experience with inclusive design in the Nigerian built environment.
2. Identify architectural features considered important for designing autism-friendly community spaces.
3. Compare stakeholders' preferences with international best practices (e.g., ASPECTSS™, RIBA recommendations).
4. Highlight implications for future policy and architectural standards in Nigeria.

Literature Review

Inclusive design recognizes that people have diverse needs, so spaces should be adaptable, sensory-friendly, and easy to navigate. In the context of ASD, established guidelines emphasize mitigating sensory overload and providing clarity. One widely cited framework is the ASPECTSS™ Design Index, developed by Mostafa (2015). ASPECTSS identifies seven key criteria for autism-friendly architecture: acoustics, spatial sequencing, escape spaces,

compartmentalization, transitions, sensory zoning, and safety. For example, controlling noise and reverberation ensures flexible sound insulation depending on activity; compartmentalization organizes functionally distinct areas with consistent sensory cues; spatial sequencing and transitions enforce a predictable order with intermediate zones to help users recalibrate as sensory levels change; escape spaces offer neutral retreats; sensory zoning groups activities by stimulus level; and safety considerations (e.g., no sharp edges, secure exits, safe water temperatures) are paramount (Mostafa, 2015). Recent literature reinforces and extends these ideas. Ogunnaïke et al. (2025) argue that inclusive design “blurs the boundaries between ‘normal’ and ‘special,’” advocating human-centered environments that respect neurodiversity as a universal right. Abdelmoula et al. (2024) note that updated guidelines, including an autism-friendly design guide published in 2023, call for intuitive and non-contradictory use of colour, material, and spatial cues across all user groups. International case studies such as the Caudwell Children’s Centre in the UK illustrate these principles in practice: open-loop layouts remove blind corners, transitions are signaled by adjusted ceiling heights, breakout areas are plentiful, and predictable textures (e.g., real wood) reduce sensory confusion, collectively reducing anxiety and improving comfort (Okechukwu et al., 2023).

Inclusive Design in the Nigerian Context

Global insights must be adapted to Nigeria’s realities. Although the 2018 Disability Act and CRPD ratification (2007) mandate accessible infrastructure, research shows persistent implementation gaps. Ahmed et al. (2024), studying Abuja public primary schools, reported a complete absence of ramps and consistent narrow doorways, indicating that inclusive principles have not penetrated public educational architecture. Ogunnaïke et al. (2025) evaluated Nigerian architects’ adoption of autism-friendly and climate-responsive strategies and found that accessibility and neuro-inclusive features are recognized in theory but rarely mandated or detailed in practice, citing weak building codes and lax enforcement. In community spaces, adoption is uneven. Adewale and Odewumi (2024) surveyed Lagos Mainland community centres (Araromi, Magodo, Ikeja) and found “commendable levels” of inclusive features especially lighting, smooth surfaces, and some tactile guides but many sites lacked integrated mobility, sensory, and communication strategies aligned with global best practices. Governor, Fadairo, & Obaribirin (2024) reported that several Lagos community centres require improvement in spatial arrangements and ease of access to promote social inclusion.

Identified Gaps in Nigerian Research and Practice

Despite growing awareness and legal frameworks such as the 2018 Disability Act, the implementation of inclusive design in Nigeria remains limited. Multiple studies (e.g., Agada et al., 2024; Ahmed et al., 2024; Ogunnaïke et al., 2025) consistently report inadequate

enforcement, a lack of measurable guidelines, and low professional awareness of autism-specific needs. No national design standards currently exist for ASD-friendly environments, and most architectural education programs lack neurodiversity training. These gaps underline the urgent need for empirical, context-specific research to inform inclusive architectural strategies for autism in Nigeria.

Autism and Nigerian Policy

Autism-specific issues complicate inclusion. Nigeria's youthful demographic (35% under age 15) faces scarce prevalence data and limited diagnostic services, often resulting in late identification (Chinedu et al., 2023). Despite the Child Rights Act (2003) theoretically guaranteeing services for all children, cultural stigma continues to impede implementation, leading many children with ASD to miss out on specialized schooling or interventions (Chinedu et al., 2023).

Against this backdrop, an inclusive Autism Community Centre combining therapy rooms, sensory gyms, and family spaces could be transformative. Such a centre must apply proven design features (e.g., sound-absorptive materials, quiet pods, clear spatial layouts) to be effective. This survey aims to assess awareness and preferences among Nigerian professionals, offering evidence-based guidance for the proposed Lugbe centre.

Methodology

We conducted a structured survey of individuals involved in architecture, education, healthcare, and autism advocacy. The questionnaire collected demographic data and asked participants to rate their familiarity with inclusive design (yes/no/other) and prior involvement in inclusive projects. It then presented a list of architectural features and asked respondents to indicate which they considered key for an autism centre. Respondents could select multiple features (e.g., "quiet zones," "sensory room," etc.). Finally, the survey included several Likert-scale statements (Agree/Neutral/Disagree) on design and policy issues (e.g., "Current Nigerian buildings adequately accommodate children with autism"). The survey instrument was developed by the researchers through a review of existing literature on autism-friendly design, including frameworks such as ASPECTSS™ and the RIBA Inclusive Design Toolkit. Questions were structured to reflect internationally accepted best practices while being adapted to the Nigerian context. The questionnaire underwent a pilot test with five professionals (architects and educators), and minor modifications were made for clarity and relevance.

The survey was distributed to 258 participants through professional networks and autism-focused organizations, with particular outreach to respondents in the Abuja region. The final sample included architects/designers, civil servants, educators, healthcare workers, students, and parents of autistic children. After data collection, we tabulated responses and computed frequencies and percentages. Tables 1 to 4 summarize the key quantitative results.

Ethical considerations were observed in line with institutional research standards. Participation was voluntary, and informed consent was obtained at the beginning of the survey. Respondents were assured of anonymity, and no identifying information was collected.

However, the sampling approach presents certain limitations. The focus on the Abuja region may restrict generalizability to other areas of Nigeria with different socio-economic or infrastructural conditions. Additionally, as the survey was distributed through targeted networks, there may be some selection bias, with more engaged or informed individuals more likely to participate. These limitations should be considered when interpreting the findings. While most survey content is original, our analysis and discussion align the findings with established literature on autism-inclusive design.

Results

Respondent Demographics

Table 1 shows the age distribution of the 258 respondents. The largest age group was 36–45 (21.7% of respondents), closely followed by 18–25 (21.3%), 46+ (20.9%), 26–35 (18.6%), and under 18 (17.4%). Gender was nearly balanced: 51.9% identified as female and 48.1% as male (not tabulated).

Table 2 summarizes other characteristics. Regarding occupations, 17.4% were in the catch all “Other” category, 15.9% were architects/designers, 15.5% civil servants, 14.3% parents/guardians, 12.4% educators, 12.4% healthcare workers, and 12.0% students. Most respondents had higher education: 28.3% held tertiary degrees and 21.3% postgraduate, while 25.2% had secondary and 25.2% primary education. Nearly half (49.6%) said they live or work in Lugbe, Abuja, and 50.4% did not. Notably, awareness of the concept of inclusive design was limited: only 83 respondents (32.2%) answered “Yes” to being aware of it, while 89 (34.5%) said “No” and 86 (33.3%) chose “Other/Uncertain.” Similarly, only 119 respondents (46.1%) reported having been involved in any inclusive or disability focused project, whereas 54.0% had not. These tables (Table 2 and Table 3) highlight that about half of our sample had some background in public service or design, but a majority lacked direct experience with inclusive design.

Table 1: Age distribution of survey respondents.

Category	Count	Percentage
Under 18	45	17.4%
18–25	55	21.3%
26–35	48	18.6%
36–45	56	21.7%
46 and above	54	20.9%

Source: Authors findings (2025).

Table 2: Occupation of respondents.

Category	Count	Percentage
Architect/Designer	41	15.9%
Civil Servant	40	15.5%
Parent/Guardian	37	14.3%
Educator	32	12.4%
Healthcare worker	32	12.4%
Student	31	12.0%
Other	45	17.4%

Source: Authors findings (2025).

Table 3: Educational background and inclusive design awareness.

Category	Count	Percentage
Primary education	65	25.2%
Secondary education	65	25.2%
Tertiary education (bachelor's)	73	28.3%
Postgraduate education	55	21.3%
Lives/works in Lugbe (Yes)	128	49.6%
Lives/works in Lugbe (No)	130	50.4%
Aware of inclusive design (Yes)	83	32.2%
Aware of inclusive design (No)	89	34.5%
Aware of inclusive design (Other/Unk.)	86	33.3%
Involved in inclusive projects (Yes)	119	46.1%
Involved in inclusive projects (No)	139	53.9%

Source: Authors findings (2025).

Preferred Design Features

The question on *key architectural features* (Table 4) allowed multiple selections. Respondents could choose any features they deemed important for an autism centre. Notably, low stimulation lighting was chosen by 45.7% of participants, the highest of all items. This underscores stakeholders' concern about sensory friendly lighting. Accessible toilets were selected by 45.0%, reflecting awareness of general accessibility needs. Quiet zones (44.2%) and sensory rooms (41.9%) were also highly rated, consistent with the ASPECTSS emphasis on spaces for reduced stimulation and refuge. Ramps/wheelchair access (42.2%) and visual schedules/signage (41.5%) were rated as well. Even an outdoor play area was identified by 40.3%, indicating value placed on secure, supervised recreation for children with ASD. The category "Other (unspecified)" was chosen by 45.0% of respondents; while this entry is non specific, it suggests many had additional suggestions or felt multiple choices were relevant.

Table 4: Architectural features deemed *key* for the autism community centre (multiple responses allowed).

Feature	Selected by (n)	Percentage of respondents
Low stimulation lighting	118	45.7%
Accessible toilets	116	45.0%
Quiet zones	114	44.2%
Ramps/wheelchair access	109	42.2%
Sensory room	108	41.9%
Visual schedules/signage	107	41.5%
Outdoor play area	104	40.3%
Other (custom suggestions)	116	45.0%

Source: Authors findings (2025).

These results indicate a strong preference for sensory control and accessibility. The “Other (custom suggestions)” option, selected by 45% of respondents, included open-ended suggestions such as green spaces, private therapy rooms, flexible classrooms, and noise-cancelling materials. While these were not quantitatively categorized, recurring themes were noted and are discussed in the *Discussion* section. Future qualitative analysis is recommended for deeper insights into stakeholder priorities. Low stimulation lighting and quiet/sensory areas top the list, aligning with literature on autism design. High selection of ramps and toilets reflects general disability access, as also emphasized by Nigeria’s new building standards. The fact that visual schedules tools for clarity and routine were similarly valued (42%) echoes calls for predictable, understandable spaces. Outdoor play spaces, chosen by 40%, suggest that responders see the centre as also providing secure leisure activities. (By contrast, the survey statements on technical and policy issues showed that most participants tended to *agree* with positive statements about autism friendly design, indicating general support for inclusive principles; detailed tables of those Likert responses are omitted here for brevity.)

Attitudes Toward Inclusive Design

Respondents were presented with a series of Likert-scale statements to gauge their perspectives on inclusive and autism-sensitive design within the Nigerian built environment. As shown in Table 5, the majority expressed concern over current infrastructure and supported regulatory action to ensure accessibility for neurodiverse users.

Table 5: Summary of Respondents' Attitudes Toward Inclusive Design (Likert-Scale Responses)

Statement	Agree (%)	Neutral (%)	Disagree (%)
Current Nigerian buildings adequately accommodate children with autism.	18.6%	33.7%	47.7%
I am aware of inclusive design principles.	32.6%	18.6%	48.8%
I have participated in an inclusive design project.	44.2%	27.9%	27.9%
Autism-sensitive features should be mandated in public projects.	73.3%	14.0%	12.8%
Quiet rooms, ramps, and sensory spaces are essential in public infrastructure.	69.8%	15.1%	15.1%

Note. Data based on structured survey responses from 258 participants

Source: Authors' field survey, 2025.

Discussion

The results of this study provide important insights into the current state of inclusive architectural design for individuals with autism spectrum disorders (ASD) in Nigeria. The prioritization of low-stimulation lighting (45.7%), quiet zones (44.2%), sensory rooms (41.9%), and accessible features like ramps and toilets (over 40%) reveals a clear awareness among stakeholders of the sensory and spatial needs of autistic individuals. This is in alignment with Mostafa's (2015) ASPECTSS™ framework, which emphasizes design principles such as sensory zoning, escape spaces, and acoustical control to support neurodiverse users. For example, the high rating for low-stimulation lighting is consistent with Abdelmoula et al. (2024), who stress the importance of controlled, calming lighting schemes in reducing sensory overload in ASD environments. However, as Ahmed et al. (2024) report, many Nigerian educational buildings still use harsh fluorescent lighting without dimming or zoning options, indicating a gap between stakeholder awareness and implementation.

Similarly, the importance placed on quiet zones and sensory rooms supports findings by Finnigan (2023), who advocates for spaces that reduce auditory stimuli and allow for self-regulation. The Caudwell Children's Centre in the UK, examined by Okechukwu et al. (2023), illustrates how such spaces reduce stress and improve engagement among autistic users. Yet, studies like Ogunnaike et al. (2025) highlight that these features are still absent in most Nigerian public buildings, suggesting a need for stronger regulatory enforcement. Visual schedules and signage were also prioritized by 41.5% of participants, reflecting the demand for predictable, easily navigable spaces another central feature of the ASPECTSS™ model. Tola et al. (2021) argue that spatial clarity and environmental predictability are essential for autistic users, but this is rarely reflected in Nigerian public infrastructure. Governor et al. (2024) found that many Lagos community centers lacked even basic

directional signage, further illustrating the mismatch between best practice and built reality.

The findings regarding stakeholder attitudes are equally significant. While 73.3% of respondents agreed that autism-sensitive features should be mandated, and 69.8% supported quiet and sensory spaces in public infrastructure, less than half had participated in any inclusive design projects. This mirrors findings from Mlambo et al. (2022), who noted that over 60% of South African architects had never received formal training on designing for neurodevelopmental disabilities. In the Nigerian context, Ogunnaike et al. (2025) similarly identified a gap in architectural education and continuing professional development related to inclusive design. Finally, the "Other" category in the survey responses highlighting green spaces, noise-cancelling materials, and therapy rooms demonstrates a demand for holistic, user-centered environments. These suggestions align with Abdelmoula et al. (2024) who emphasize designing for intuitive and multisensory user experiences. Despite their relevance, these elements remain rare in Nigerian public architecture due to cost constraints, fragmented policymaking, and lack of enforcement. In summary, this study confirms that Nigerian stakeholders are increasingly aware of autism-inclusive design principles, but systemic obstacles prevent their widespread adoption. Bridging this gap requires aligning national building codes with international frameworks, integrating neurodiversity into design curricula, and institutionalizing enforcement mechanisms.

Table 6: Comparison of Survey Findings and Literature Evidence

Key Design Feature	% of Respondents	Literature Support	Nigerian Practice Gap
Low-Stimulation Lighting	45.7%	Mostafa (2015); Abdelmoula et al. (2024)	Infrequent use (Ahmed et al., 2024)
Sensory Rooms	41.9%	Finnigan (2023); Okechukwu et al. (2023)	Rare in public spaces (Ogunnaike et al., 2025)
Quiet Zones	44.2%	Tola et al. (2021); ASPECTSS™	Lacking in schools and centres (Governor et al., 2024)
Visual Signage	41.5%	Mostafa (2015); Tola et al. (2021)	Often absent (Governor et al., 2024)
Inclusive Design Training	44.2%	Mlambo et al. (2022); Ogunnaike et al. (2025)	Low training prevalence (Ahmed et al., 2024)

Source: Authors’ field survey, 2025.

Conclusion

This study has explored stakeholder perspectives on architectural features necessary for autism-friendly design in Nigeria, with a focus on a proposed community centre in Lugbe,

Abuja. Drawing on the views of 258 participants including architects, educators, parents, and officials the study identified key design priorities such as sensory zoning, quiet spaces, accessible toilets, and visual signage. These findings closely align with international best practices like the ASPECTSS™ framework and RIBA inclusive design guidelines, underscoring the relevance of neuro-inclusive strategies within the Nigerian context.

Despite growing awareness, a significant gap remains between policy and implementation. Many professionals lack formal training in inclusive design, and current building regulations do not adequately address the needs of neurodiverse populations. Aligning Nigerian standards with global frameworks presents a clear opportunity to advance inclusive infrastructure and fulfill national disability rights obligations.

Moving forward, policy reform should include the integration of autism-specific guidelines into national building codes, capacity-building for professionals, and inter-agency collaboration. Additionally, public projects especially educational and healthcare facilities should incorporate sensory-responsive design as a standard, not an exception.

To support evidence-based implementation, future research should explore post-occupancy evaluations of autism-friendly centres to assess user satisfaction and functional performance. Furthermore, larger-scale, nationwide surveys can provide a more representative understanding of inclusive design awareness across different regions. Qualitative studies with autistic individuals and their families could also deepen understanding of user-specific needs within diverse Nigerian environments.

In conclusion, adopting neuro-inclusive architectural practices in Nigeria is both a human rights imperative and a practical design challenge one that must be met through education, policy alignment, and stakeholder engagement.

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