Designing With, Not For: Empowering People With A Learning Disability Through Inclusive Architecture

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To my beloved husband, Mostafa.
Your unwavering love and support made this journey possible.

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To my family, whose unconditional love and encouragement have been my constant source of strength.

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Abstract

Keywords: co-design, inclusive design, learning disability, participatory research.

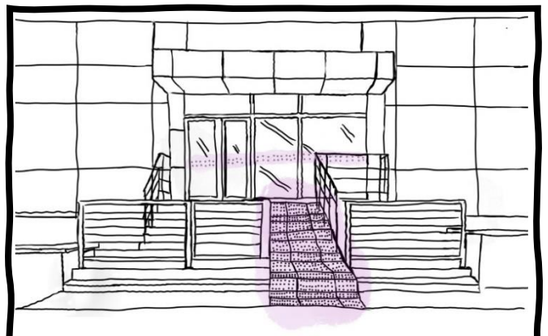
Historically, people with a learning disability were spoken of rather than spoken with. Consequently, building codes and regulations do not adequately address their needs, the architectural industry does not fully understand their accessibility requirements, and they are rarely active participants in architectural research. Thus, this thesis aimed to propose architectural insights that alleviate the barriers people with a learning disability face in the built environment. This was achieved by actively engaging people with a learning disability through a personalised co-design research process, characterised by various enabling measures. This inclusive methodology not only enriched the research but also provided a replicable framework for inclusive architectural research practices.

In this thesis, participatory action research served as the overall methodological framework, centring on the participants' perspectives. Within this framework, ethnography was utilised to offer deeper insights into participants' lived experiences. The research design included four stages. The first was the Scoping stage, which aimed to understand how people with a learning disability use different buildings in Cardiff and collaboratively identify a case study through interviews (n=10). The second stage, Exploring, involved exploring the architectural barriers faced by people with a learning disability through walking interviews in a shopping centre in Cardiff (n=18). The third, Synthesising, focused on validating the identified barriers through focus groups (n=12). Finally, the Co-design stage involved proposing solutions through co-design workshops (n=14). Data were analysed using reflexive thematic analysis, integrating the researcher's insights and reflections from employment in a self-advocacy organisation.

The originality of this research stems from two main contributions: firstly, the methodological framework, which enabled the active and inclusive participation of people with a learning disability in architectural research. These methodological insights included novel findings, such as the value of employing a disabled facilitator, collaboration and employment with a self-advocacy organisation in architectural research and the impact of fieldwork location. Secondly, the foundational architectural insights, which encompassed both intangible and tangible aspects, addressing the critical gap regarding the needs of people with a learning disability. The architectural insights also included novel insights, such as holistic accessibility awareness, the utilisation of coping mechanisms as a source of creativity, and the synergy between different architectural insights. Although this research may not immediately address the gap in regulations, it was complemented by several initiatives that may have a future impact, ultimately fostering more inclusive buildings.

Accessible Summary

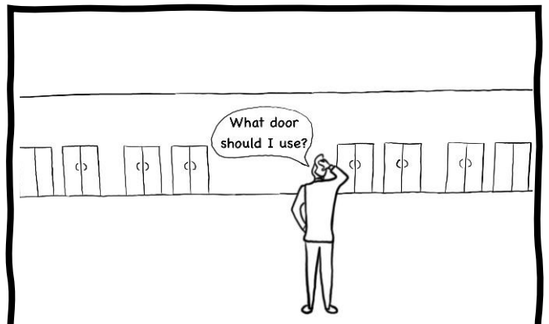
1



At the begining of my research, I noticed that buildings include accessible features for people with physical impairments and people with visual impairments.

Start

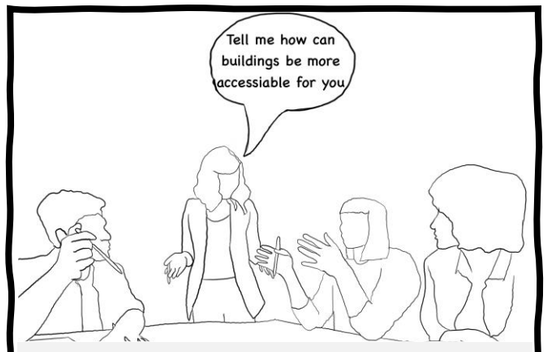
2



However, many buildings are not designed for people with a learning disability. Designers do not know their accessibility needs.

Problem

3



I worked with people with a learning disability to understand the barriers they face in buildings and create solutions with them.

Method

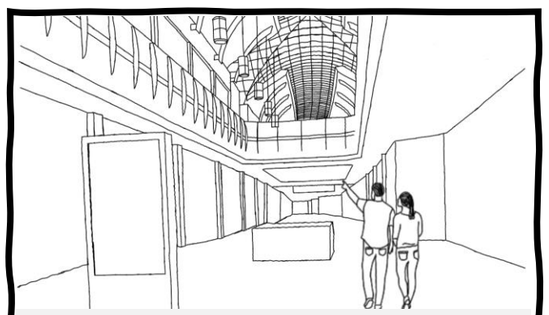
4



First, I interviewed people with a learning disability to understand what buildings they visit in Cardiff.

Step 1

5



Then, I took people with a learning disability on walks around a shopping centre in Cardiff.
They told me what they liked and what they hated.

Step 2

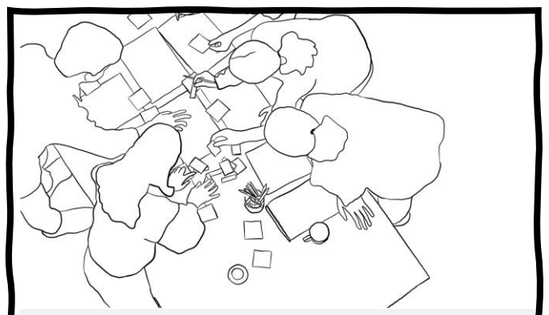
6



After that, we sat in groups to discuss what everyone liked and hated and why.

Step 3

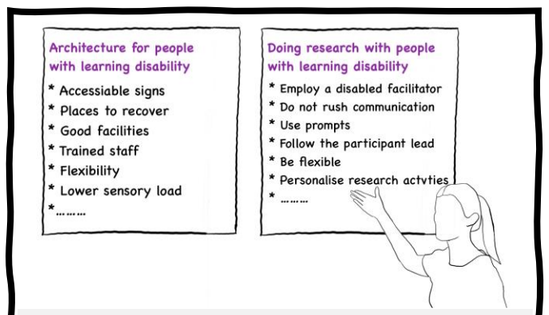
7



Lastly, we sat together again to design solutions to make buildings more accessible.

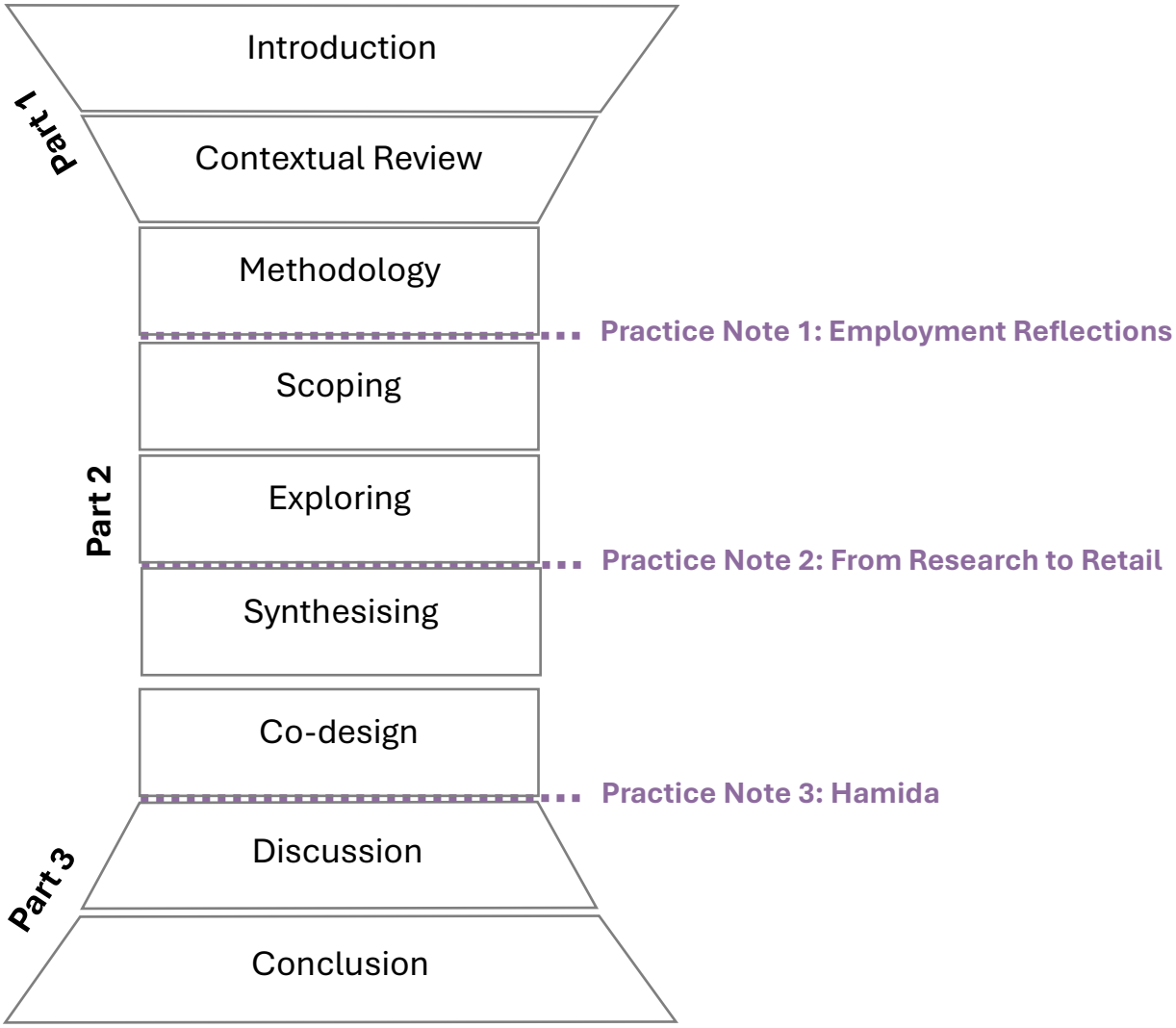
Step 4

8



Researchers should employ someone with learning a disability and be flexible to involve them in research. Buildings must have break spaces, clear signs, and good facilities for a better accessibility.

End



The structure of the thesis, with its distinctive chapters, and the practice notes interspersed between. This also demonstrates how the first part of the thesis serves as a contextualisation of the topic, before moving on to the research stages in part two and finally concluding in part three with the discussion and conclusion.

Note on visuals: throughout this thesis, purple serves as an intentional visual cue of disability pride, resonating both within the United Kingdom and internationally. In recent years, advocates have reclaimed purple to advance a positive narrative around the social and economic contributions of disabled people (Rutnam 2017). In the UK, the term "Purple Pound" highlights the collective spending power of disabled households, underscoring their critical role in the economy (The Purple Pound 2015). Likewise, "Purple Tuesday," established by Inclusive Employers, dedicates a day to empowering organisations to enhance accessibility and customer service for disabled people, their families, carers, and support networks (Inclusive Employers [no date]). By weaving purple accents throughout the visuals, this thesis not only reflects these growing movements but also foregrounds disability as a lens through which all narratives are interpreted.

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1. INTRODUCTION

This chapter provides the opening dialogue for the thesis, outlining the research rationale, problem, questions, aims, contribution and structure.

Introduction

The built environment shapes accessibility and social inclusion, either facilitating participation in society or creating barriers that exclude disabled people. This highlights the importance of inclusive design, ensuring that everyone, including disabled people, can fully participate in social life. This was emphasised by The United Nations Convention on the Rights of Persons with Disabilities (CRPD), 2006, which sought to "promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities" (United Nations 2006a). Article 9 of the CRPD specifically mandates that State Parties must guarantee that disabled people have access, on an equal basis with others, to the physical environment, transportation, and other facilities and services open to the public (United Nations 2006b). This international framework emphasises the importance of accessibility to the built environment as a fundamental right to ensure equal quality of life for disabled people.

Disability, as defined by the World Health Organization (WHO), is an umbrella term that encompasses impairments, activity limitations, and participation restrictions arising from the interaction between an individual's health condition and their contextual factors, whether environmental or social (World Health Organization 2022). Disability is an inherent aspect of the human condition; nearly everyone will experience some form of impairment, whether temporary or permanent, at some point in life, particularly as they age and face increasing difficulties in functioning (World Health Organization 2022). According to the WHO's Global Report on Health Equity for Persons with Disabilities, an estimated 1.3 billion people worldwide live with some form of disability, accounting for 16% of the global population (World Health Organization 2022). In the United Kingdom (UK), approximately 1.5 million individuals have a learning disability, representing 2.16% of adults and 2.5% of children, with 54,000 adults in Wales (Mencap 2022b).

Learning disability is characterised by reduced intellectual ability and difficulties with everyday activities such as household tasks, socialising, or managing money, which affect individuals throughout their lives (Mencap 2022c). These characteristics can reduce an individual's ability to access, use, and enjoy buildings, as they may face challenges in both obtaining and processing the necessary information to navigate the built environment (Castell 2008). An accessible built environment is significant for people with a learning disability, as it encourages their independence and reduces the risk of marginalisation (Salmi 2007). People with a learning disability should be able to navigate and interact with built environments, which enhances their independence and social participation, in which architecture plays a vital role.

Architecture can facilitate specific functions and stimulate behaviours that are beneficial for people with a learning disability (Gaudion and Pellicano 2016; Mulligan et al. 2018; Aljunaidy and Adi 2021; Jebril and Chen 2021). The interaction between people with a learning disability and the built environment can have subtle yet significant

effects on their well-being, shaping how they engage with space and making their disability more visible (González et al. 2020; Park et al. 2020). Hence, architects need to design environments that ensure the inclusion of people with a learning disability. To achieve this, the participation of end-users throughout the design process is necessary (Frauenberger et al. 2011; Castell 2014; Gaudion et al. 2015; Hendriks et al. 2015; Sarmiento-Pelayo 2015; Frauenberger et al. 2019; Shuayb 2020). End-users, particularly disabled people, can provide valuable insights for the design process through use cases, new relationships, and unanticipated scenarios, contributing their expertise and lived experiences to the development of design solutions (Sarmiento-Pelayo 2015; Sitbon and Farhin 2017; González et al. 2020). This approach contrasts with traditional methods of addressing accessibility, which often involve retrofitting existing environments to make them more accessible as an afterthought.

Similarly, the classical model of research must be expanded to actively involve people with a learning disability, not just as subjects of research but as active expert participants. While there is evidence of good practice showing positive results when disabled people are meaningfully engaged, their involvement is often treated as an afterthought or a tokenistic process with limited impact on the final outcomes (House of Commons Women and Equalities Committee 2017). Engaging people with a learning disability in the design process is essential for a better understanding of their accessibility needs, which can also help address the current lack of representation of their requirements in building standards (Castell 2014). Every effort should be made to enhance their contributions, where their input can concretely influence the research outcomes (González et al. 2020).

Collaborative research approaches can be the answer. Consequently, this research aimed to explore how to engage people with a learning disability in architectural research and investigate their accessibility needs. This was achieved through a qualitative approach that combined participatory action research with ethnographic methods. The study was conducted in Cardiff, Wales, and included adult participants with a learning disability who either lived in the city or visited it on a regular basis. The study began with an analytical review of relevant literature, contextualising the study within existing architectural guidelines for people with a learning disability. Data collection was organised into four stages in which participants were actively involved.

The first stage, Scoping involved semi-structured interviews to explore how people with a learning disability interact with public buildings and to identify a suitable case study setting collaboratively (n=10). This was followed by Exploring, using walking interviews to capture the experiences of navigating the built environment, revealing architectural barriers (n=18). The third stage, Synthesising consisted of three focus groups designed to validate and refine the themes identified earlier, facilitating collective reflection and ensuring that the findings accurately represented the perspectives of participants (n=12). In the final stage Co-design, three co-design workshops were held, where participants collaborated with the researcher to develop inclusive design solutions based on insights gained from previous stages (n=14).

Alongside these research stages, extended fieldwork was conducted through the researcher's concurrent employment at a local self-advocacy organisation. This allowed for prolonged engagement with the community, enriching the data with informal observations and deepening rapport with participants. The data from all stages were analysed using reflexive thematic analysis, which incorporated the researcher's positionality and reflections from the field. The study's contribution stemmed from two key outputs: (i) a methodological framework for involving people with a learning disability in architectural research, and (ii) a set of architectural insights designed to address the barriers they face in the built environment. The architectural insights were categorised as tangible and intangible. Tangible insights refer to physical and spatial elements, such as unclear signage, disorienting entrances, or inaccessible facilities. Intangible insights, in contrast, relate to social, emotional, or cognitive experiences, such as social experiences, a lack of staff, or unfamiliarity with a space. While the two categories are analytically distinct, there is often overlap between them. A single design feature may simultaneously produce both types of barriers, illustrating the complexity of designing truly inclusive environments.

While the recommendations presented in this thesis may not always be directly transferable to professional design practice due to practical constraints, they offer valuable insights for shaping more inclusive approaches. The researcher recognises that not all researchers or practitioners can engage in long-term employment or voluntary roles to build the same level of access to the learning disability community. However, the research demonstrates that tailored co-design methods, such as the co-design workshops, can provide a practical and scalable model for inclusive collaboration. When thoughtfully designed, participatory methods can ensure that the voices of people with a learning disability are heard early enough to inform, rather than merely validate, key design decisions. Ultimately, it highlights the importance of involving people with a learning disability throughout the planning, design, and implementation of research and design projects, wherever possible, to ensure meaningful and practical outcomes.

Research Rationale

Equal access to the built environment is a fundamental right that should stand on its own merit without a need for justification. Nonetheless, it aligns with broader international and national objectives aimed at fostering more equitable societies. On an international scale, the United Nations' Sustainable Development Goals (SDGs) explicitly address the importance of inclusive cities. Goal 11, "Make cities and human settlements inclusive, safe, resilient and sustainable," highlights the necessity for equal access to public spaces (United Nations 2015). Target 11.7 aims to "By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities" (United Nations 2015). This global commitment emphasises the urgency of ensuring that the built environment, particularly public buildings and spaces, is designed to

accommodate everyone, including people with a learning disability, whose needs are frequently overlooked in conventional design processes.

The UK is a signatory nation of the CRPD and its optional protocol (United Nations 2016) and passed the Equality Act 2010 into law (Parliament of the United Kingdom 2010), which replaced the Disability Discrimination Act (DDA). The Equality Act provides legal protection against discrimination (Government Equalities Office and Equality and Human Rights Commission 2016), aiming to ensure equal access to the built environment for everyone in the UK.

Nationally, inclusive design principles align with the Well-being of Future Generations (Wales) Act 2015, which underscores the creation of a more equal Wales where people can reach their full potential regardless of their circumstances (Department for Natural Resources of the Welsh Government 2015) The Act's emphasis on long-term well-being aligns closely with the necessity of designing environments that accommodate people with a learning disability who frequently encounter obstacles in accessing public spaces. By addressing these obstacles, inclusive design can contribute to fostering a society that prioritises equity and enables all citizens to engage fully.

Furthermore, Cardiff Council has shown leadership in promoting inclusivity by pledging to become Wales' first Neurodivergent Friendly City (Neurodivergent Friendly Cardiff 2025). This initiative aims to eliminate the barriers faced by neurodivergent individuals, ensuring that public services and spaces are more accessible and inclusive (Cardiff Council (2023). This underscores the council's intention to be more inclusive. Similar campaigns and strategies should also be implemented to address the unique needs of people with a learning disability.

In addition to policy frameworks, there is a growing focus on ethical practice in the architectural profession. The Royal Institute of British Architects (RIBA) has highlighted the importance of ethical decision-making through its Ethical Practice Knowledge Schedule, which includes principles related to equity, diversity, and inclusion, specifically the "Duty to Society and the End User." The schedule emphasises the responsibility of architects towards users, ensuring that architectural practice fosters environments free from bias and discrimination (Royal Institute of British Architects 2021). More recently, RIBA also published the Inclusive Design Overlay to the RIBA Plan of Work, further embedding inclusive design considerations across all project stages (Royal Institute of British Architects 2023).

All the previous policies assert the importance of equal access. However, the built environment is extremely slow to adjust, and major barriers to the equal participation of disabled people in everyday activities still exist in the built environment (Goodall 2010; Boys 2014). One contributing factor may be the prevalence of historic building stock in the UK, which often predates accessibility legislation. As approximately 20% of England's total housing stock was constructed before 1919 (Historic England 2025), with Wales having a substantial number of listed buildings, over 30,000, which require careful adaptation to meet accessibility needs (Data Map Wales [no date]). While it is

recognised that some barriers may persist in the short or medium term (Goodall 2010), addressing these challenges remains crucial. Furthermore, none of these previous policies explains how to achieve equal access or create inclusive environments, which was the aim of this research through participatory methods.

Research Problem

The preceding section highlighted the reasons for designing accessible environments for people with a learning disability, “The Why?”. However, what is missing is the method for creating such environments and how to incorporate their voices into both architectural research and practice, “The How?”.

People with a learning disability have been marginalised and overlooked in society (Mathers 2008; World Health Organization 2011), and the context of architectural design and research is no exception (Castell 2008; Park et al. 2020). While physical impairments have acquired widespread attention in the architectural field since the 1970s (Mathers 2008; Hamraie 2017), the needs of people with a learning disability are frequently excluded because of a limited understanding of their needs and challenges (Castell 2008; Castell 2012; Park et al. 2020).

In practice, residential, learning, and therapeutic environments are usually modified retroactively to fit the needs of people with a learning disability, with no universal guidelines or design considerations and limited research resources (Castell 2008; Castell 2012; Castell 2014; Finlayson et al. 2015; Hafez et al. 2021; Jebril and Chen 2021; Kooyman 2021; Serin et al. 2021). This situation either incorrectly assumes that existing regulations adequately fulfil the needs of people with a learning disability, and/or indicates an insufficient understanding of their access needs (Sherman and Sherman 2013; Castell 2014; Serin et al. 2021). It perhaps even suggests a broader lack of interest in addressing those specific needs, revealing a deeper systemic issue at the intersection of social perspective, building regulations, and architects’ attitudes.

Social perspective

Historically, people with a learning disability have faced significant discrimination and marginalisation (Castell 2014; Kooyman 2021; Jarrett and Tilley 2022). For a long time, misconceptions about learning disability, such as the belief that it was contagious or required segregation, dominated societal attitudes (Jarrett and Tilley 2022), coupled with limited knowledge about the causes of learning disability (Castell 2014; The National Health Service 2022). This stigmatisation not only isolated people with a learning disability but also delayed a deeper understanding of their specific needs, including those related to the built environment (Castell 2014).

As a result, people with a learning disability have often been excluded from conversations about their rights, including equal access. Instead of being active participants, they have historically been spoken of rather than consulted directly. This has limited their ability to contribute to discussions about building design (Castell

2014), highlighting a perpetuation of an ableist approach in architecture, by prioritisng a non-disabled perspective in design. This also include the inability to engage meaningfully with people with a learning disability through a variety of communication methods and techniques. Consequently, this created a lack of a feedback loop reaching back to the designers (Sherman and Sherman 2013).

This lack of effective communication is identifiable as a missing link in the creation of policy and design practice that includes people with a learning disability (Mathers 2008). As a result, many professionals involved in designing the built environment remain unaware of the specific needs of the learning disability community (Gray et al. 2003; Sherman and Sherman 2013; Serin et al. 2021).

Building standards and regulations

Globally, building codes and regulations often fail to adequately represent the needs of people with a learning disability. For instance, in the United States, while the Americans with Disabilities Act (ADA) addresses accessibility, it provides limited guidance on ensuring access for people with a learning disability (Salmi 2007). Similarly, in Australia, the Disability (Access to Premises) Standards and related building codes overlook the unique needs of this community (Castell 2008).

In the UK, the situation is comparable; the Equality Act 2010 requires that all buildings be accessible to everyone without discrimination (United Kingdom Parliament 2010). However, the act offers little clarity on how to accomplish this. Accessibility is frequently defined by ambiguous criteria, such as “reasonable cost,” “reasonable time,” and “reasonable ease”; yet, what qualifies as “reasonable” is not clearly defined. (Goodall 2010; Evans 2015). As a result, these “reasonable” improvements do not always adequately address the wide range of barriers faced by people with a learning disability (Mathers 2008).

Moreover, current regulations often shorthand disability to physical impairment, particularly emphasising wheelchair accessibility. In the UK, accessibility measures primarily focus on removing obstacles for wheelchair users, even though only 8% of registered disabled people in the UK rely on wheelchairs (Imrie and Hall 2001; Evans 2015). This issue was highlighted in a House of Commons debate, where it was noted that Part M of the British Building Regulations—covering access and use of buildings—failed to reflect modern best practices in inclusivity. The regulation was described as “very light” in addressing the needs of disabled people who do not use wheelchairs (House of Commons Women and Equalities Committee 2017; Her Majesty’s Government 2020).

A report from the House of Commons Women and Equalities Committee (2017) further emphasised this gap, concluding that reliance solely on minimum standards is inadequate for creating an inclusive built environment. Despite legal mandates for accessibility, the present regulatory framework is either too vague or too minimal to guarantee that buildings are genuinely inclusive for the broad spectrum of disabilities.

Architects' attitudes towards learning disability

While architects are typically skilled in construction, placemaking, and graphic representation, they are not usually trained in disability inclusion (McAllister and MaGuire 2012). Architects' interpretations of community inclusion are significantly influenced by their familiarity with the wide range of users, including disabled users (Sherman and Sherman 2013; Altay et al. 2016). Feelings of exclusion often arise from the limited awareness and negative attitudes of professionals responsible for designing the built environment. Ensuring that architects embrace inclusive design principles is essential to overcoming these challenges (Sherman and Sherman 2013; Ergenoglu and Bayraktaroglu 2016).

Therefore, architects must observe and comprehend how various users interact with spaces in real-life settings to create genuinely inclusive environments that foster meaningful relationships between users and the built environment (Altay et al. 2016). However, this approach is not standard practice. A UK survey by Imrie and Hall (2001) revealed that only 8% of architects consistently consider the needs of people with a learning disability in their designs, the lowest rate compared to other types of disabilities. The survey also highlighted that only 6% of architects indicated that they consulted individuals with learning difficulties during the design of buildings, underscoring a significant gap in practice (Imrie and Hall 2001).

A prevalent issue is that many professionals involved in shaping the built environment tend to categorise disability narrowly, focusing primarily on physical impairments. This limited perspective often excludes hidden disabilities, such as learning difficulties, mental health challenges, and cognitive impairments (Mathers 2008; Sherman and Sherman 2013; Castell 2014; Danso et al. 2017; Shuayb 2020). This perspective is akin to the viewpoint of the regulations, which may have contributed to it. Simultaneously, within the disability field, there has been a tendency to assume that architects perhaps ignore the needs of disabled people due to ego or creative arrogance (Boys 2014).

Additionally, some architects often view accessibility as merely a matter of compliance, primarily focusing on regulations to avoid legal consequences (Sherman and Sherman 2013). This leads to superficial changes, such as ramps and curb cuts, which meet minimal disability standards yet overlook the broader needs of diverse user groups (Sherman and Sherman 2013). The rise of access consultants has further severed accessibility from conventional architectural practices, for example, the foundation of National Register of Access Consultants (NRAC) in 1999 (Boys 2014; National Register of Access Consultants 2025). This led to addressing accessibility as a parallel and often conflicting endeavour (Boys 2014). An additional challenge arises from the differing priorities of clients and commissioners. Often, they may express interest in following good practice until they realise the associated costs; at this point, they tend to revert to meeting only the minimum required standards (McDonagh 2023).

These problematic perspectives can be traced back to architectural education. In the UK, inclusive design is not a compulsory part of architectural education, and students

are not obligated to engage thoroughly with accessibility issues (Scott et al. 2018; Kasem et al. 2023). The RIBA Graduate Attributes for Part I and Part II similarly lack any mention of inclusivity (RIBA Education Department 2014). However, it is important to note that the Architects Registration Board (ARB) is currently reforming the structure of architectural education. As of 2023, the ARB introduced new competency outcomes that explicitly include Equality, Diversity, and Inclusion (EDI), signalling a shift toward embedding inclusivity more formally within architectural initial education and training (Architects Registration Board 2023). Nonetheless, under the existing framework, many architects have been shaped by a system in which inclusivity is peripheral, contributing to the unintentional creation of invisible barriers that hinder full community inclusion for people with a learning disability.

Research gap

The previous problem section revealed a deep, systemic issue that lies at the intersection of social perspective, building regulations, and architects' attitudes, contextualising the research gap (see Figure 1-1). Architectural design has historically focused on the needs of normative users, bodies and behaviours, often neglecting the diverse needs of disabled people (Goodall 2010; Danso et al. 2017; Aljunaidy and Adi 2021). While substantial research and regulatory frameworks exist to support accessibility for people with physical and sensory impairments, the architectural barriers faced by people with a learning disability remain significantly underexplored. A systematic review indicated that conditions such as dementia and autism dominate the field of architectural research (Aljunaidy and Adi 2021).

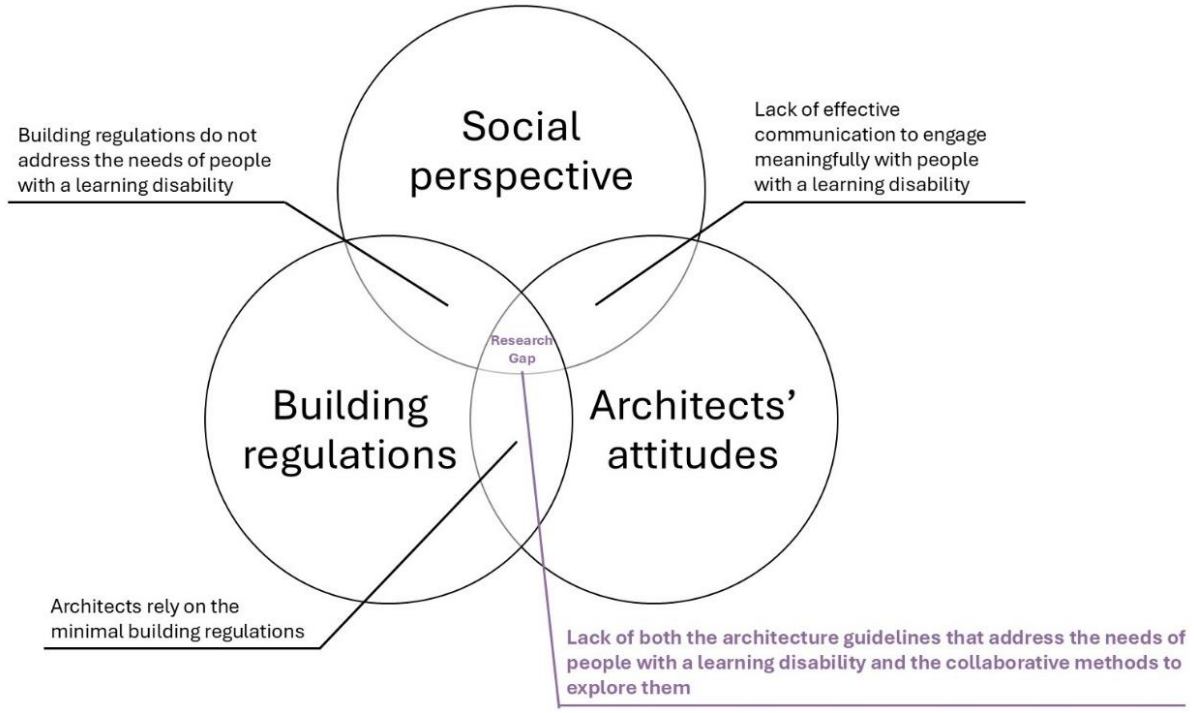


Figure 1-1: The research gap at the intersection of social perspective, building regulations, and architects' attitudes

As a result, guidelines have emerged to address the needs of neurodivergent people (Mostafa 2014a; The British Standards Institution 2022; Manning et al. 2024), who live with conditions such as autism, attention deficit hyperactivity disorder (ADHD), attention deficit disorder (ADD), dyslexia, dyscalculia and dyspraxia (Oxford Health 2023). However, these guidelines are not always sufficient for the needs of people with a learning disability, as only 28.6% of those with a learning disability also have autism (National Health Service England 2020). Consequently, the neurodiversity models fail to address the unique needs of this group, highlighting the necessity for architectural guidelines specifically tailored to learning disability.

To address this gap, this research aimed to develop architectural insights that can help better accommodate the needs of people with a learning disability. These insights are based on a methodological framework designed to enhance communication between architectural researchers and people with a learning disability. Ultimately, this research aspires to contribute to a more inclusive built environment, ensuring that people with a learning disability receive the same level of consideration in design as other user groups.

Research Questions

The research addresses the following questions:

1. How can architectural research effectively include people with a learning disability?
2. How do people with a learning disability experience and interact with buildings?
3. What are the architectural barriers faced by people with a learning disability in the built environment?
4. What design solutions can make buildings more inclusive for people with a learning disability?

These questions were developed by the researcher, informed by early engagement with relevant literature and initial consultations with a self-advocacy organisation, which will be detailed in the Methodology chapter. However, they were not co-created with participants.

Research Aim

This research aimed to provide architectural insights that address the barriers faced by people with a learning disability in the built environment. Additionally, it aimed to develop a methodological framework that enables architectural research to effectively include people with a learning disability as active participants. Both outputs prioritised the perspectives and experiences of people with a learning disability. This was attainable through the following objectives, which were covered throughout the different chapters (see Table 1-1):

1- Explore effective methods for co-designing with people with a learning disability in architectural research.
2- Understand how people with a learning disability use buildings.
3- Investigate the architectural barriers that people with a learning disability encounter in the built environment.
4- Synthesise recommendations to overcome these barriers through co-design.

Table 1-1: Chapter to objective mapping

1- Introduction		
2- Contextual Review		
3- Scoping	→	Objectives 1+2
4- Exploring	→	Objectives 1+2+3
5- Synthesising	→	Objectives 1+2+3+4
6- Co-design	→	Objectives 1+4
7- Discussion		
8- Conclusion		

Research Contribution

The main contributions of this research emerged from two key aspects:

- The development of a methodological framework that enables people with a learning disability to be active participants in architectural research.
- The architectural insights tailored to the needs of people with a learning disability.

Enhancing accessibility for the learning disability community -the ultimate aim of this research- is not only beneficial for people with a learning disability but also supports access for a broader population, including their caregivers and families (Castell 2012; Mencap 2016). Moreover, inclusive environments improve the experience of all building users, reinforcing the principle of "Good Design" (Hamraie 2017). Consequently, while the research targets adults with learning disability, it could also benefit other populations, including:

- Children with learning disability accompanied by caregivers.
- Older people experiencing cognitive decline.
- Neurodivergent individuals.

Additionally, the proposed methodological framework and architectural insights have several potential applications:

- Integrating people with a learning disability into both the design and research process, ensuring their voices are heard throughout.
- Guiding the design or renovation of more inclusive environments, ensuring accessibility from the start.
- Serving as an assessment tool for evaluating the inclusivity of existing buildings.

- Contributing to advocacy work that seeks to influence public policy and building regulations, by offering evidence-based insights that promote greater inclusivity in the built environment.

Thesis Structure

This thesis is organised into nine chapters and three practice notes, which reflect the project's participatory methodology and its development across the four research stages.

- **Chapter 1: Introduction**
  This chapter introduces the research topic, explaining the rationale, problem, questions, aims, contribution and structure. It outlines the gap in architectural research regarding the inclusion of learning disability and introduces the methodological approach.
- **Chapter 2: Contextual Review**
  This chapter builds upon the literature introduced in Chapter 1 by providing a more focused examination of learning disability, inclusive design, and their intersection. It lays the groundwork for understanding the necessity of inclusive architectural practices that extend beyond mere regulatory compliance.
- **Chapter 3: Methodology**
  The chapter details the methodological foundations of the study, which combines participatory action research with ethnographic methods. It describes the four research stages, the data collection and analysis methods, the ethical framework, and the researcher's positionality, including preparatory work to enable meaningful participant involvement.
- **Practice Note 1: Employment Reflections**
  This reflective note draws from the researcher's parallel work as an employee at a self-advocacy organisation. It provides insights into the lived experiences of people with a learning disability, highlighting the everyday significance of support roles for people with a learning disability.
- **Chapter 4: Scoping (Stage 1)**
  This chapter presents the first stage of research, involving semi-structured interviews with adults with a learning disability in Cardiff. It explores how participants navigate public buildings and identifies a case study setting. The insights gathered here informed the subsequent research stage.
- **Chapter 5: Exploring (Stage 2)**
  This chapter focuses on the walking interviews conducted with the participants to explore their architectural experiences in a shopping centre. It highlights how various spatial features impact accessibility, offering both architectural and methodological insights.
- **Practice Note 2: Beyond Research**
  Extending the research into applied contexts, this practice note documents collaborations with a national retailer and involvement with the British Standards

Institute. It also includes an accessible guide for retail spaces, demonstrating how the research findings contributed to wider advocacy and practice beyond the core study.

- **Chapter 6: Synthesising (Stage 3)**
  This chapter covers the focus groups conducted to validate and deepen the understanding of the architectural barriers identified in earlier stages. These sessions allowed participants to collectively reflect on their experiences, refine key findings, and contribute to the development of the architectural insights.
- **Chapter 7: Co-design (Stage 4)**
  This chapter presents the final research stage, which involved co-design workshops. Participants worked collaboratively with the researcher to propose inclusive design solutions.
- **Practice Note 3: Hamida**
  This reflective narrative presents two voices: that of the researcher and the disabled research facilitator, Hamida, capturing the personal and relational dimensions between them.
- **Chapter 8: Discussion**
  The discussion chapter synthesises findings across all stages of the research. It presents the two main contributions: a methodological framework for involving people with a learning disability in architectural research and a set of architectural insights aimed at making the built environment more inclusive.
- **Chapter 9: Conclusion**
  The final chapter summarises the research's contributions, discusses its limitations, and proposes recommendations for future research. It also presents the potential impact of the study on community engagement, pedagogy, and advocacy.

2. CONTEXTUAL REVIEW

This chapter reviews the literature, contextualising the thesis within the existing body of knowledge.

Introduction

The impact of the built environment on its users is undeniable, and disabled people are not an exception (Gaudion et al. 2014). Despite the progress made by disability activism since the 1970s, which has influenced both regulatory standards and design guidelines, many buildings remain inaccessible nearly 50 years later (Goodall 2010; Boys 2014; Altay et al. 2016). Disability continues to be an afterthought in much of architectural design, leading to both physical and social isolation for disabled people (Boys 2014; Gaudion et al. 2014; Altay et al. 2016).

Architects hold an ethical responsibility to design spaces that meaningfully accommodate the diverse needs of users (Altay et al. 2016). This ethical commitment to inclusive design principles is fundamental to this research, which was informed by the social model of disability. The social model views disability as a socially constructed issue arising primarily from environmental barriers, rather than as a personal tragedy or solely medical concern (Oliver 1983). It aims to eliminate physical, organisational, and attitudinal obstacles that prevent disabled people from gaining greater choice and control over their lives (Gaudion and Pellicano 2016).

Guided by this perspective, this research aimed to propose practical changes that reduce or, ideally, eliminate environmental barriers for people with a learning disability. Nevertheless, recognising the complexity of disability experiences, the research adopts the World Health Organization's (WHO) integrated definition of disability, as previously introduced in P.2, combining elements of both the social and medical models.

This contextual review explores learning disability, inclusive design, and their intersection with architectural practices. It first examines learning disability by addressing two main areas: (i) the experiences of people with a learning disability in the built environment, and (ii) existing architectural guidelines related to their needs. It then delves into inclusive design through two main sections: (i) the imperative for inclusive design, and (ii) potential venues for promoting inclusive design. Throughout, the review highlights gaps in current literature, supports the rationale for this research, clarifies key terminologies, and situates the study within the broader fields of architecture and disability studies.

Learning Disability

Learning disability refers to a reduced intellectual ability that affects an individual throughout their entire life (Mencap 2022c). The nature and impact of learning disability vary widely between individuals; no two people experience it in the same way (The National Health Service 2022). Learning disability is often associated with specific health conditions. For example, all individuals with Down's syndrome have some level of learning disability, and many people with cerebral palsy and epilepsy also experience learning disability; many autistic individuals also have learning disability (Mencap 2022c; The National Health Service 2022).

Rather than being solely defined by limitations in intelligence and adaptive skills, learning disability is understood more holistically as a challenge that affects various aspects of an individual's life, including their health, participation in the community, and social roles (Sherman and Sherman 2013). The effects of learning disability can be broadly categorised into two main areas (Cleveland Clinic 2023):

- **Cognitive and information processing symptoms**: These include delayed learning, slower reading speed, difficulties with reasoning and logic, challenges with judgment and critical thinking, trouble with problem-solving and planning, and distractibility or difficulty focusing.
- **Adaptive behaviours**: These refer to difficulties with daily activities, such as slower development of self-care skills, challenges in social development, reliance on caregivers for basic tasks, and difficulty understanding social interactions, time management, or financial concepts.

The actual number of people with a learning disability is increasing, in England, the number of people with a learning disability increased from 1.5% in 2018 to 1.9% in 2023 (National Health Service England 2023; Department of Health and Social Care 2025). Moreover, the current number of people with a learning disability is likely higher than official records suggest due to several factors (Castell 2008). Firstly, the diverse perceptions of disability may prevent individuals from identifying as disabled. Secondly, cultural differences and feelings of shame or pride can influence responses in surveys. Thirdly, inconsistencies in the definitions of mild, moderate, or severe disability further complicate the accuracy of statistics. Consequently, the actual number of people with a learning disability is likely higher than estimates suggest, leading to an increasing demand for adequate provisions to support their needs.

Terminology

There are different terminologies used to describe learning disability across different regions. In the UK, the terms "learning disability" and "learning disabilities" are often used (Mencap 2022c; The National Health Service 2022). Internationally, organisations such as the World Health Organization (WHO) and the American Association on Intellectual and Developmental Disabilities (AAIDD) use the term "intellectual disability" (World Health Organization 2022; American Association on Intellectual and Developmental Disabilities [no date]).

This research used the term “learning disability” and “people with a learning disability” as the participants generally used them. Still, it was noted that a few participants also used the term “learning difficulties”. However, it is widely used in the UK to describe difficulties in learning where intellectual functioning is not affected, such as dyslexia, dyscalculia and dysgraphia (Mencap 2022c; National Health Service 2022); hence, it was avoided.

Some resources list learning disability under neurodiversity (Cleveland Clinic 2022; National Autistic Society [no date]). Neurodiversity refers to the concept that certain

developmental disorders are normal variations in the brain (Wiginton 2023). However, there is no agreed-upon or official list of who is considered neurodivergent, and it relies on self-identity (National Autistic Society [no date]). The participants did not use this term to identify themselves, hence it was also avoided. Additionally, guidelines for neurodiversity will not be compared to the findings except in the final Discussion chapter.

The research also adopts the term "disabled people" following the social model of disability to highlight that the disability stems from the physical, organisational, and attitudinal barriers, not the impairment itself. Disabled people widely endorse this term (Disability Rights UK [no date]). Similarly, the research uses the term "Autism" instead of "Autism Spectrum Disorder" (Kenny et al. 2016). There is no universal way of describing autism that is universally accepted and preferred by the UK's autism community. However, the term "autistic" is the preferred language of many people with autism (Kenny et al. 2016). Hence, the research uses this term as well as person-first language, "people with autism".

Experiences of people with a learning disability in the built environment

Disabled people, through their interaction with the built environment, can perceive qualities that designers may often overlook (Vermeersch and Heylighen 2015). Consequently, the built environment can be adapted to enhance the well-being of disabled people (Goodall 2010; World Health Organization 2011; Gaudion et al. 2014). Despite the significance of architectural design in shaping the daily lives of disabled people, there is a notable lack of critical theoretical work in this area (Boys 2014). Additionally, the value of lived experiences of disability is rarely acknowledged as a resource in architectural practice (Vermeersch and Heylighen 2015).

For people with a learning disability, the built environment can have both positive and negative effects, significantly impacting their daily lives and independence. There is evidence that the built environment can be adapted to support the interaction of people with a learning disability in spaces, leading to increased independence. For instance, the use of international symbols and colour-coded signs can help people with a learning disability navigate buildings more effectively (Castell 2012). People with a learning disability expressed that greater independence would greatly improve their quality of life (Mencap 2022a). The UK's Valuing People strategy, issued by the Department of Health, also emphasised the importance of promoting independence for people with a learning disability, though it acknowledges that support may still be required based on individual needs (Department of Health 2001) which is supported by the WHO's Global Report on Health Equity for Persons with Disabilities (World Health Organization 2022).

Conversely, inaccessible or exclusionary environments can create confusing and challenging spaces, significantly increasing distress for users (Hafez et al. 2021). For example, effective interaction with space depends on clear wayfinding, intuitive

layouts, and accessible information. When these elements are overlooked, the built environment itself becomes inaccessible, causing difficulties for people with a learning disability (Howie et al. 2012). This exclusion frequently leads to reduced community participation (World Health Organization 2011; Sherman and Sherman 2013), limiting full social integration. Additionally, poorly designed environments can exacerbate existing health and well-being challenges. For example, inadequate or inaccessible spaces discourage physical activity, significantly contributing to higher obesity rates among adults with mild to moderate learning disability (Howie et al. 2012).

This exclusion may be attributed to the often-invisible nature of learning disability. As a result, the interaction between people with a learning disability and the built environment is frequently overlooked or considered more abstract compared to people with physical disabilities (Hafez et al. 2021). This invisibility means that the barriers faced by people with a learning disability require further exploration and clarification. Consequently, designers may inadvertently neglect the needs of people with a learning disability when designing buildings (Castell 2008; Park et al. 2020).

Barriers faced by people with a learning disability in the built environment

Many people with a learning disability depend on their caregivers or assistive devices to interact more effectively with built environments (Castell 2012; Hafez et al. 2021). This dependency limits independence and restricts access to buildings, increasing isolation. Previous research indicated that 82% of people with a learning disability reported feeling lonely (Clifford and Barrett 2022). They may avoid outdoor activities due to fears of getting lost in unfamiliar places (Delgrange et al. 2020).

Despite this, research on the challenges faced by people with a learning disability in accessing buildings remains limited. A systematic study conducted by Aljunaidy and Adi of manuscripts published between 2008 and 2020 with keywords including architecture, interior design, physical environment, and mental disorders revealed that there were many studies about dementia and autism, highlighting a notable research gap (Aljunaidy and Adi 2021).

The accessibility barriers experienced by people with a learning disability in existing research can generally be categorised into two broad areas: intangible barriers and tangible barriers. While distinct, these two categories often overlap and interact, which will be detailed in the following sections.

Intangible barriers

People with a learning disability share barriers related to community perception with other disabled people, many of whom reported that society's response to their disability, rather than the impairment itself, is their primary challenge (Boys 2014). However, people with a learning disability also face specific challenges, including issues with communication, literacy, information processing, and memory (Nind and Seale 2009). Although these intangible social challenges may not be directly linked to architecture, they nevertheless affect the overall accessibility of the built environment; hence, it is vital to explore them.

- Stigma and social exclusion

Disablism, a form of discrimination grounded in societal prejudice against disabled people, is historically and structurally embedded in many societies, perpetuating exclusion and marginalisation (Goodley 2014). Historically, people with a learning disability have not been appropriately treated by society. Over many centuries, they have faced varying degrees of rejection and isolation (Hassanein 2015). Stigma, attitudinal barriers, and social exclusion remain persistent obstacles for people with a learning disability (Abbott and McConkey 2006; Emerson and Hatton 2008; Hall 2010; Sherman and Sherman 2013; Boys 2014; Hassanein 2015; Scior and Werner 2015; Mencap 2022a). This societal stigma can lead to discrimination in employment, housing, and community involvement (Hall 2010; Sherman and Sherman 2013).

The effects of stigma begin early, with eight out of ten children with a learning disability experiencing bullying or hate crimes (Mencap 2019). Nearly one-third report experiencing rudeness or dismissive behaviour within the last year (Emerson and Hatton 2008). Such experiences can lead individuals to avoid leaving their homes altogether (Mencap 2022a). Hence, stigma can be seen as a predominant barrier to accessibility.

Additionally, the widespread conflation of disability primarily with mobility impairments, such as the use of a wheelchair or a cane, contributes to a narrower understanding of disability among both professionals and the general public (Imrie and Hall 2001; Goodall 2010). This limited perception reinforces stereotypes that fail to recognise the diversity and complexity of disabled people's lived experiences (Boys 2014). As a result, learning disability become poorly understood or overlooked, further intensifying social exclusion and accessibility barriers.

- Cognitive barriers

For people with a learning disability, complexity, whether in communication, navigation, or interaction, can present significant barriers. Some verbal and written communication can be highly frustrating for people with a learning disability due to physiological, psychological, and social barriers (Mathers 2008). For example, people with a learning disability often require accessible written information, known as 'Easy-Read' (World Health Organization 2022). Typically, an Easy-Read document contains minimal text and is presented in a simple format using a larger font, simple words and short sentences (see Figure 2-1). Easy-Read format also uses pictures and photographs to help the reader understand the content (Mencap 2024). Information that is not presented in an Easy-Read format can be inaccessible to people with a learning disability (Tilly 2019). This can affect a range of information, such as online information, signs, and flyers, making complexity both an intangible and tangible barrier.

(a)	This research aims to create design guidelines that can help make buildings more accessible for people with a learning disability.
(b)	 This research tries to make buildings more accessible for people with a learning disability.

Figure 2-1: Example of Easy-Read format. (a) Regular text extract, which may be inaccessible for people with a learning disability. (b) Easy-Read version of the same text extract, featuring simplified language, increased text size, and a photo aid

The challenges of complexity are often coupled with the challenges of illiteracy (Nind and Seale 2009), since people with a learning disability often have lower literacy levels. Only about one-third engage in educational or training activities (Emerson and Hatton 2008). This affects their ability to participate in activities reliant on verbal and written communication, which is amplified by the broader societal reliance on communication skills (Nind and Seale 2009; Hall 2010). This was noted by people with a learning disability themselves, as they highlighted that the lack of literacy and numeracy skills is a barrier to social inclusion (Abbott and McConkey 2006).

Another barrier related to complexity is pace. Previous research showed that people with a learning disability present relatively slow processing and reaction times in accessing information (Nind and Seale 2009). Thus, their encounters with temporal challenges are not merely restricted to unusually stressful situations; they also represent a frustrating aspect of their daily experiences and a considerable barrier to social participation.

- Support and risk aversion

The level of support needed by people with a learning disability varies widely, but it plays a crucial role in enabling independence (Mathers 2008; McClimens et al. 2014). Many require help with everyday activities such as travelling, shopping, or navigating public services (Mencap 2019; World Health Organization 2022). While support can provide protection, familiarity, and a sense of security, it may also involve rigid routines, imposed rules, and overprotection, which can undermine confidence and autonomy (Mathers 2008).

For example, when individuals choose to step outside their routine to explore new environments, such as visiting unfamiliar public spaces, they may face unrealistic expectations or discouragement from caregivers. Families and support workers sometimes limit the use of public transport due to safety concerns, inadvertently reducing opportunities for independence and inclusion (Mathers 2008; Sherman and Sherman 2013). Inadequate or overly restrictive support structures can therefore become barriers in themselves, reinforcing social exclusion (Department of Health 2001; Mencap 2022a).

These dynamics are reinforced by a broader culture of risk aversion, often rooted in assumptions about vulnerability rather than individual capability (Goodall 2010). This

contributes to a built and social environment where safety concerns, whether based on actual experiences or perceived dangers, affect people's confidence and willingness to engage with new spaces (Hall 2010; Fudge Schormans et al. 2019). Common concerns include fear of strangers, getting lost, or encountering aggressive or unpredictable behaviour (McClimens et al. 2014).

Tangible barriers

Research on the tangible barriers faced by people with a learning disability in the built environment is limited, focusing primarily on wayfinding challenges. It often fails to address the varied and specific difficulties encountered by people with a learning disability in their daily lives (Delgrange et al. 2020). Hence, this section will review the previous research on wayfinding and navigation challenges faced by people with a learning disability, including wayfinding cues and spatial complexity.

- Wayfinding and navigation

Wayfinding is the process of navigating to a destination using environmental cues, which involves complex cognitive processes (Farr et al. 2012). Cognitive impairments can significantly hinder the ability of people with a learning disability to process necessary information for effective wayfinding (Castell 2012). Complicated wayfinding can lead to significant frustration and disappointment. As a result, people with a learning disability may abandon buildings due to various difficulties, such as maintaining focus, impatience, or overwhelming frustration (Salmi 2007; Delgrange et al. 2020).

Additionally, attempting to seek help can become a source of stress if others do not understand their needs (Castell 2012). They often anticipate needing assistance and may either become more attentive, request help, or give up entirely when faced with complex navigation tasks (Delgrange et al. 2020). Challenges related to wayfinding and navigation can generally be grouped into two categories: insufficient or unclear wayfinding cues and spatial complexity. These will be examined in the following subsections.

Wayfinding cues

Navigating the built environment can pose challenges for people with a learning disability, primarily due to insufficient wayfinding cues. People with a learning disability often experience memory deficits, particularly short-term memory, which may impair their ability to recall directions or instructions. This difficulty is exacerbated by a reduced capacity to transfer information between locations, rendering each visit to a building potentially new and perplexing (Castell 2012). Additionally, some people with a learning disability may find it challenging to remember directions, and a few may become confused between right and left, which complicates following directions using a map or mobile device (Zach and King 2022).

As previously mentioned, the learning disability community have lower literacy levels. As a result, their reading skills may be insufficient to comprehend written directions, and their interpretive skills may not enable them to understand the meanings of the

signs they encounter (Castell 2012). Coupled with the societal reliance on verbal and written communication, this exacerbates wayfinding challenges for people with a learning disability (Mathers 2008). Additionally, Zach and King found that if an individual with a learning disability possesses strong reading skills, this does not necessarily lead to enhanced spatial ability (Zach and King 2022).

Consequently, effective wayfinding cues are vital for acquiring directions and processing the information required for navigation. The lack of clear and accessible cues can lead to frustration, confusion, and a reduced sense of confidence, impeding the ability to navigate effectively (Salmi 2007). Research indicated that emotional well-being significantly affects navigational abilities, and positive emotional states enhance spatial working memory, suggesting that wayfinding aids which induce positive emotions could reduce anxiety and improve navigation outcomes (Delgrange et al. 2020).

Effective wayfinding cues ought to strategically connect directions to these spatial landmarks, emphasising key elements of the environment and facilitating easier and more intuitive navigation (Delgrange et al. 2020). Integrating wayfinding cues makes environments more accessible for people with a learning disability, reducing cognitive load and enhancing navigation experiences. For example, using landmarks as reference points simplifies navigation and aids decision-making during the journey (Castell 2012).

Not only is the existence of wayfinding cues vital, but also its design. The design of wayfinding cues often fails to meet the needs of people with a learning disability. For example, inadequate use of colour, text size, imagery, and terminology in signage makes navigation exceedingly difficult (Castell 2012). Amplified with a lack of simple language or picture/symbol aid, which makes it harder for people with a learning disability to comprehend the meaning of the sign.

Another example is using non-standardised symbols and/or lengthy explanations (see Figure 2-2) (Castell 2012). Furthermore, confusing text or lack of consistency in terminology can also create a barrier, for example, using two different terms, “X-ray department” and “Radiology Department,” on different signs to direct to the same location (Castell 2012). Directories are another similar example, as they provide detailed and potentially complex information that may be hard for someone with a learning disability to grasp (Salmi 2007; Castell 2012). Confusing sign directions can also present a barrier; for example, a sign which is intended to indicate straight ahead shows an arrow pointing upwards (see Figure 2-3), leading the person with a learning disability to look upwards, as they tend to translate the directions literally (Castell 2012).



Figure 2-2: Non-standardised symbol used for a toilet sign



Figure 2-3: A sign with arrows pointing upward for a straightforward destination

The visibility of wayfinding cues can also be a barrier for people with a learning disability, since adults with learning disability are ten times more likely to be blind or partially sighted compared to the general population (The United Kingdom Practice and Development Team and Royal National Institute of Blind People Visual Impairment Learning Disability and Complex Needs Services 2015). Barriers include the lack of colour contrast or poor lighting conditions, such as reflections or glare (Castell 2012).

Maps are another wayfinding challenge, as they necessitate a certain level of cognition for users to interpret two-dimensional information within a three-dimensional environment (Castell 2012). People with a learning disability showed difficulty in building a cognitive map in a wayfinding task (Zach and King 2022). Some may be able to understand the purpose of a map but not necessarily comprehend it (Salmi 2007).

When people with a learning disability become lost, they often seek assistance (Delgrange et al. 2020). However, they may find it difficult to find the reception desk if it is not next to the entrance, and they may also find it intimidating to approach the reception desk if it is in the middle of an open space, especially if they are brightly lit, loud, or confusing in design (Salmi 2007; Castell 2012). In addition, wayfinding systems that rely heavily on reception counter staff to assist may be intimidating for people with a learning disability who have poor communication skills. Some may be nonverbal, which would greatly diminish the effectiveness of the reception desk. They may also

struggle to know whom or what to ask and, more importantly, to remember what they have been told (Castell 2012).

Spatial complexity

As mentioned, complexity presents both intangible and tangible barriers. Complex layouts are more complicated for people with a learning disability to navigate. They often serve to discourage the independence of people with a learning disability, increasing stigmatisation and continued dependence on caregivers (Salmi 2007). People with a learning disability often feel fear and sadness in complex or unexpected situations. They also request help more often during such events due to reduced independence in problem-solving (Delgrange et al. 2020).

Complexity can also result from a distracting environment, with lots of sensory input, making it hard for people with a learning disability to focus on the wayfinding process, for example, noise, sound, and smell (Castell 2012). However, previous research has shown that smell can contribute to the memory of a location or influence feelings and preferences for certain situations, such as the aroma of baking bread (Salmi 2007).

Existing architectural guidelines for people with a learning disability

The previous section outlined the barriers people with a learning disability face, this section reviews the existing guidelines for people with a learning disability, highlighting the gaps and contextualising the research. It discusses three categories of guidelines: mandatory regulations, best practices in the UK, as well as examples of guidelines presented in research.

Mandatory regulations

In the UK, legislative measures such as the DDA,1995 and its successor, the Equality Act of 2010, were introduced to improve accessibility in new developments and encourage the upgrading of existing environments (United Kingdom Parliament 2010). These acts were responses to the demands of disability activists and academics for greater inclusion. Associated with these legislative frameworks, Part M of the Building Regulations, first introduced in 1997, sets out requirements for the accessibility of buildings. It aims to establish a baseline for accessibility in both dwellings and non-dwelling buildings (The United Kingdom Government 2024).

Despite their mandatory nature, building regulations often fail to address all access needs fully, remaining minimal and vague, as previously noted in the research problem, focusing more on compliance than on actual needs (Goodall 2010). This issue corresponds with what Boys (2014) describes as a "recurring pattern of both invisibility and over-exposure" (Boys 2014, p.25), where disabled people are either overlooked, leading to vague regulations, or regarded as exceptional cases, resulting in minimal regulations. This dichotomy can lead to regulations that are either insufficiently detailed or overly restrictive.

Perspectives on these regulations differ significantly among stakeholders. The building industry often perceives such legislation as expensive and stifling to creativity, whereas

disabled people see these regulations as vital for ensuring that building access is recognised as a civil right (Gray et al. 2003). Consequently, progress towards completely accessible buildings and environments is slow and incremental.

Best practice guidelines

Best practice guidelines, such as those from the British Standards Institute (BSI), can integrate seamlessly with innovative design ideas, particularly those informed by consulting with disabled people (Goodall 2010). For example, BS 8300-1 and 2 'Design for an Accessible and Inclusive Built Environment', provide recommendations on creating inclusive and accessible environments (The British Standards Institution 2024). These guidelines serve as a valuable resource for enhancing accessibility in the built environment. However, it is important to note that these standards are not mandatory. Designers may perceive these standards as constraints that inhibit creative design (Goodall 2010).

Moreover, BS 8300-2 acknowledges the need for further development, especially in addressing neurological requirements. The document states: "Efforts have been made to include reference to people's neurological requirements in this revision and extension of BS 8300; however, further work is required in this area" (The British Standards Institution 2018). Consequently, most recommendations within BS 8300 primarily cater to people with physical impairments, particularly wheelchair users, and to a lesser extent, those with visual impairments and impaired dexterity. However, there is a clear lack of provisions for people with a learning disability.

The British Standard Institute recently introduced PAS 6463:2022, 'Design for the Mind – Neurodiversity and the Built Environment.' Which is believed to be the first of its kind by a national standards body to offer guidance on accommodating various sensory processing differences and conditions in the built environment (The British Standards Institution 2022). Its launch indicates a significant shift from earlier design standards, which have prioritised accommodating diversity in physical abilities, motor skills, vision, and hearing, but have overlooked neurological diversity (Slocombe 2025). It still cannot be used explicitly to address the needs of people with a learning disability, as previously discussed in the Research Gap section.

In 2023, the Royal Institute of British Architects (RIBA) published the Inclusive Design Overlay to the RIBA Plan of Work, further embedding inclusive design considerations across all project stages. The overlay encourages design teams to engage with a broader range of users, consult inclusive design specialists, and prioritise equity and accessibility throughout the design process (Royal Institute of British Architects 2023). While it reflects a significant cultural and professional shift, the overlay primarily provides strategic guidance and does not yet offer detailed, actionable direction for specific user groups. This further highlights the ongoing need for more targeted, user-informed frameworks such as the one proposed in this thesis.

Guidelines from research

There are numerous frameworks and guidelines designed to create environments that are autism friendly. For example, ASPECTSS™ and ASPECTSS™ 2.0 (Mostafa 2014b; Mostafa 2014a; Mostafa 2015; Mostafa 2018; Mostafa 2021), Sensory-Inclusive Supermarkets (Manning et al. 2024), and Guidelines for Creating Autistic Inclusive Environments (Gatfield et al. 2018), among others. However, it is crucial to note that only 28.6% of people with a learning disability also have autism (National Health Service England 2020). Therefore, these guidelines may not sufficiently meet the needs of people with a learning disability.

A notable study by Salmi focused on improving wayfinding for people with a learning disability within unfamiliar public buildings. The methodology involved initial assessments by 47 university students with backgrounds in interior design or developmental disabilities, followed by practical wayfinding tasks performed by participants with learning disability, where the participants provided verbal feedback on their navigation experiences (Salmi 2007). While Salmi's work offers significant insights into wayfinding, this thesis sought to broaden the scope by examining other architectural attributes in addition to wayfinding. Hence, it provides a more comprehensive understanding of the physical environment's role in facilitating or hindering accessibility for people with a learning disability.

In addition to Salmi's work, other researchers provided highlights on the accessibility of people with a learning disability in the built environment, for example, (Castell 2008; Mathers 2008; Castell 2012; Sherman and Sherman 2013; Castell 2014). Although their work is vital and, therefore, frequently cited in this study, they do not provide holistic insights.

While existing regulations, guidelines, and research offer valuable insights into creating more inclusive environments, they remain limited in their ability to address the specific needs of people with a learning disability. This gap is what this thesis sought to address through the development of architectural insights for people with a learning disability.

Recent research by Zallio and Clarkson (2021) reinforces these concerns, demonstrating that while awareness of inclusive design is increasing, its implementation remains inconsistent, particularly in addressing cognitive and neurodiverse needs. Their findings underscore the need for more inclusive, user-informed design guidance (Zallio and Clarkson 2021). This thesis addressed these gaps by proposing both a methodological framework and a set of architectural insights, co-developed with people with a learning disability, to inform more inclusive and effective design practice.

The clear gaps identified in existing architectural guidelines for people with a learning disability highlight the broader challenge in the architectural profession of addressing diverse user needs. To effectively overcome such gaps, it is essential to shift the discussion towards the principles of inclusive design, which aim to cater to the broadest possible spectrum of users holistically. By embracing inclusive design

approaches, architects can better address the complexities associated with learning disability and other co-occurring conditions, moving beyond compliance and guidelines towards truly accessible environments. The following section explores inclusive design, its rationale, barriers, and potential, providing a comprehensive context for the architectural insights proposed by this research.

Inclusive Design

Inclusively designed environments offer diverse spatial qualities and opportunities for use in multiple ways, accommodating varied abilities (Heylighen et al. 2017). Historically, architectural design has often catered to a normative view of human psychology and physicality (Danso et al. 2017; Aljunaidy and Adi 2021), embodied by references to the Vitruvian Man by Da Vinci and Le Modulor by Le Corbusier. Consequently, most buildings are designed for the "average" user, disregarding the spectrum of user needs that exists in reality, and targeting a narrow band of users while overlooking the broader diversity of human experiences across gender, age, situation, race, and ability (Mathers 2008; Sherman and Sherman 2013; Boys 2014; Castell 2014; Danso et al. 2017; Shuayb 2020; Zallio and Clarkson 2021) (see Figure 2-4).

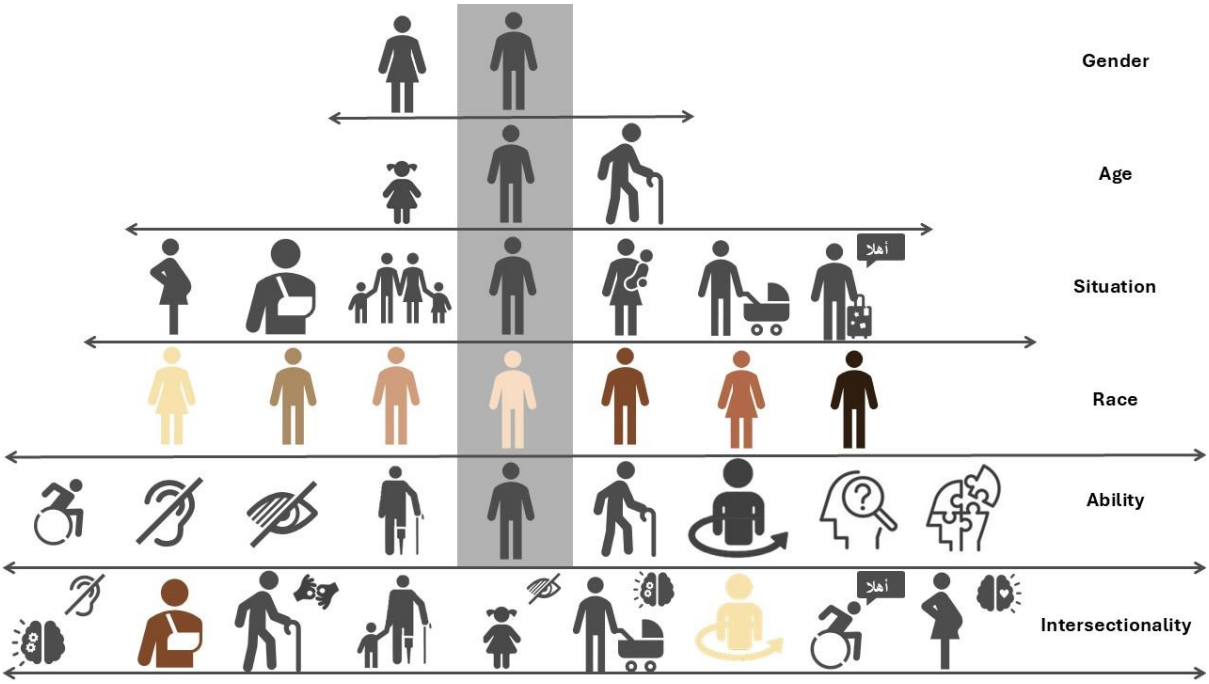


Figure 2-4: End user spectrums where mainly the grey area is targeted by designers

Several terms, such as Inclusive Design, Universal Design, Barrier-Free Design, Design for All, and Accessible Design, have emerged to describe the accessibility of the built environment. Despite their different origins and some semantic distinctions, these approaches share a common goal: they aim to create "Good Design" that benefits everyone (Steinfeld 2012; Boys 2014; Hamraie 2017). Echoing Paul Hogan's quote, "Good design enables, bad design disables" (Daly 2017) and the overarching belief that buildings accessible to disabled people invariably result in better functionality for all

users (Boys 2014). This research adopted the term "Inclusive Design" due to its emphasis on including as many people as possible.

There are numerous definitions of inclusive design, coined by various organisations. Heylighen et al. outlined the common elements between them:

> *"Inclusive design is a way of designing, an approach to design; that it focuses on how design can address themes like diversity, equality, and social inclusion; that it strives towards the greatest possible application; and that the resulting design can be used by all people."* (Heylighen et al. 2017, p. 509).

Fortunately, inclusive design has gained traction in recent years, driven by global trends toward greater societal inclusion of disabled people, demographic changes such as population ageing, and a heightened awareness of diversity. This interest is further motivated by the increasing recognition of the importance of participation in society (Heylighen et al. 2017).

The imperative of inclusive design

Architecture connects with people's needs and desires, orchestrating daily social and spatial practices (Boys 2014). Everyone deals with architecture every day; no one can avoid it or choose to skip it. As Philippe Daverio put it:

> *"Architecture is the only art that you can't help but feel. You can avoid paintings, you can avoid music, and you can even avoid history. But good luck getting away from architecture"* (Bates 2014).

Inspired by this fundamental role of architecture in daily life, from the researcher's perspective, advocating for inclusive design is a moral imperative. This aligns with the RIBA's Ethical Practice Knowledge Schedule, which emphasises the responsibility of architects to create environments that enable all users to thrive (Royal Institute of British Architects 2021). However, there are additional justifications for embracing inclusive design principles, including:

- **Inclusion vs. exclusion:** Buildings inherently have the ability to promote inclusion or heighten exclusion (Goodall 2010; Sherman and Sherman 2013; Gaudion et al. 2014). This capability underscores the significance of designing spaces that not only meet aesthetic or functional criteria but also accommodate the diverse needs of all users (Goodall 2010; Sherman and Sherman 2013).
- **Universal relevance of inclusive design:** Inclusive design is pivotal not just for disabled people but for the entire population. It recognises the diversity of human abilities, which vary over an individual's life course, and acknowledges that anyone can benefit from or be hindered by the built environment (Heylighen et al. 2017).
- **Law mandate:** Architects in the UK are legally required to design accessible spaces under the Equality Act.

- **Enhanced sustainability:** Creating inclusive environments also leads to sustainable development. By reducing the need for future adaptations, along with the associated environmental and economic costs, inclusive design practices promote longevity and functionality in architecture (Goodall 2010; Heylighen et al. 2017).

However, there is an existing perception that inclusive design is a utopian ideal, challenging to implement effectively, under the assumption that by attempting to design for everyone, the needs of no one are fully met. This view can lead to uncertainty among architects and professionals about what inclusive design precisely entails (Heylighen et al. 2017). For example, environmental adaptations beneficial for one disability group can inadvertently create challenges for another; drop kerbs essential for wheelchair users may confuse visually impaired individuals unless tactile surfaces or auditory signals are integrated (Goodall 2010).

On the other hand, another perspective argues that the 'needs' of the wide spectrum of disability can be met unproblematically through building design (Boys 2014), which this research supports. For example, the refurbishment of the Royal National Institute of Blind People (RNIB) – Grimaldi Building by Buro Happold supported the needs of people with visual impairments in addition to incorporating PAS 6463:2022 to make it also neurodiversity-friendly (Buro Happold 2023).

Potential venues for promoting inclusive design

The shift of the built environment industry's perspective on inclusive design can be facilitated through two primary strategies: regulation (*coercion)* and education (*persuasion)* (Goodall 2010; Ergenoglu 2015; Heylighen et al. 2017). When inclusivity is lacking in these foundational areas, all subsequent policies and services are less effective (Ergenoglu 2015). Although this research may not immediately impact regulations or education, it aimed to establish guidelines for involving people with a learning disability in architectural research and to highlight their unique accessibility requirements. These efforts could eventually shape regulations and educational methods, ultimately fostering more inclusive settings.

Building standards and regulations

For the built environment professionals, building codes are often the primary source of guidance, linking inclusive design closely with accessibility legislation (Heylighen et al. 2017). However, as previously mentioned, accessibility legislation has predominantly focused on removing barriers for wheelchair users, which has led to a narrow interpretation of accessibility requirements (Imrie and Hall 2001; Evans 2015; House of Commons Women and Equalities Committee 2017; Her Majesty's Government 2020). Therefore, following Part M, which mainly concerns physical impairments, does not guarantee adherence to the broader requirements of the Equality Act, which calls for fair access for all users (Goodall 2010).

Other complexities concerning building standards and regulations include a lack of coherence and coordination among different governmental bodies. For instance, the definition of disability in Part M differs from that used in the Disability Discrimination Act (DDA), resulting in confusion and inconsistent applications of the law (Goodall 2010). Moreover, organisational challenges hinder the enforcement of inclusive design principles. For instance, the National Planning Policy Framework highlights the significance of inclusive design yet neglects to specify its legal status, frequently leading to its perception as a 'nice-to-do' rather than a mandatory requirement (House of Commons Women and Equalities Committee 2017).

While there are movements to strengthen regulatory approaches, they often fall short of creating substantial change in the built environment. This is because regulations tend to be target/goal-oriented, hence, most effective in situations with simple cause/effect relationships and are frequently perceived as the upper limits of required standards rather than as baselines (Goodall 2010).

This fragmented approach has led to a lack of comprehensive policies that genuinely promote inclusive design. A significant factor contributing to this gap is the poor communication between regulatory bodies and the disabled community (Mathers 2008). Hence, there is an urgent need to involve the disabled community in the development of standards. Collaborative approaches can foster engagement and empowerment, ensuring the needs of all users are understood and integrated into the design process. This approach, discussed further in the Methodology Chapter, could establish more effective standards that reflect the needs and experiences of the disabled community.

Education

Architectural education holds the potential to plant the seeds of inclusion from the outset of an architect's career (Goodall 2010; Danso et al. 2017; Soyupak 2021). It serves as a critical platform for building disability awareness and helping budding architects recognise the profound impact of their design decisions (Soyupak 2021). However, despite its importance, inclusive design is often relegated to a minor position within architectural curricula. Consequently, students may spend a minimal amount of time studying inclusive design principles (Fleck 2015), and they frequently lack opportunities to engage deeply with issues of diversity and equality in practical settings, such as live projects or stakeholder interviews (Deakin 2020; Kasem et al. 2023). This education gap may result in a professional field that is ill-equipped to foster environments which truly accommodate all users.

Consequently, there is a pressing need to embed inclusive design within the architectural curriculum to address these deficiencies. This can start by fostering ethical responsibility among students, urging them to adopt the social model of disability, which focuses on societal barriers that restrict disabled people rather than the disability itself (Ergenoglu 2015; Kasem et al. 2023). Furthermore, the architectural curricula should incorporate comprehensive information on disability, deepening

students' understanding of how different impairments influence an individual's interaction with the built environment (Goodall 2010).

Lastly, architectural education ought to encourage students to adopt critical, user-centred design methods. This might entail direct interaction with stakeholders via interviews or involvement in projects aimed at tackling genuine accessibility challenges (Kasem et al. 2023). By transforming the educational framework in this manner, the concept of inclusive design can be fundamentally redefined, equipping future architects with the tools and perspectives needed to create truly inclusive environments.

Collaborative approaches

As noted above, radical changes in the implementation of inclusive design may stem from legality or education perspectives. However, a successful implementation of both requires the active participation of the disabled community, either as consultants for the development of guidelines or as stakeholders in education. Collaborative approaches can fulfil this, which will be explored in the next Methodology chapter.

Conclusion

This chapter included two main sections: learning disability and inclusive design. It examined the literature related to the relationship between people with a learning disability and the architectural industry, highlighting the pressing need for a more inclusive approach to building design. This exploration revealed several critical gaps. Firstly, despite the calls for equitable access by international and national policies, regulations often fall short of effectively addressing the needs of people with a learning disability, remaining vague or narrowly focused on physical impairments. Secondly, the architectural industry's limited involvement with inclusive design principles and the disabled community leads to a poor understanding of the unique barriers faced by people with a learning disability in built environments.

This resulted in an inadequate understanding of how people with a learning disability interact with and experience their environments, as well as a scarcity of data on how to effectively involve them in the design process and/or design research. To address these gaps, this thesis actively involved people with a learning disability throughout various stages of the research, employing a collaborative approach to ensure that their needs and experiences shape the outcomes. By integrating their firsthand insights into the development of architectural solutions, this thesis advocates for more genuinely inclusive design practices. The subsequent chapter examines the collaborative approach utilised and discusses the methodology and specific strategies employed to foster an inclusive research environment.

3. METHODOLOGY

This chapter provides an overview of the thesis methodology, outlining the research design, data collection methods, and analysis. It also examines collaborative design approaches, contextualising the thesis within the existing research.

Introduction

This chapter explores the collaborative approach utilised in this research to ensure the active involvement of people with a learning disability in the research process. The research employed a qualitative approach, combining participatory action research and ethnography, utilising a range of data collection methods, including observations, interviews, walking interviews, focus groups, and workshops. Given that active participation by people with a learning disability is central to the research, this chapter begins by reviewing collaborative research approaches and positioning this research within them. Following this, the chapter discusses the research methodology, design, data collection methods and techniques, and research analysis methods. It justifies the suitability of each element for achieving the research aims. The chapter concludes with a discussion of the preparations made for data collection, establishing the foundation for the first stage of fieldwork, which will be presented in the next chapter.

This study adopted a participant-centred qualitative approach, which is particularly effective for capturing the nuanced experiences and perspectives of individuals on-site where they encounter the issue (Creswell and Creswell 2018). This makes it ideal for capturing the experiences of people with a learning disability within the built environment. This qualitative approach integrated Participatory Action Research and Ethnography. Participatory action research facilitated collaborative knowledge generation, treating participants as co-researchers to address shared goals, while ethnography enabled a deep exploration of participants' interactions and lived experiences within the built environment. Consequently, prioritising the active involvement of the participants ensured that their voices and lived experiences were central to the research process.

Collaborative Research Approaches

In the built environment, there is a distinct separation between end-users, clients, and designers. Designers and clients often do not represent the full diversity of end-users, who vary significantly in psychological and physiological characteristics, including abilities, age, and gender (Altay et al. 2016). Consequently, architects may face challenges in comprehending the specific requirements for accessibility and inclusivity, emphasising the need for collaboration with experts in disability studies and engagement with the end users (Frauenberger et al. 2011; Castell 2012; Gaudion et al. 2015; Hendriks et al. 2015; Sarmiento-Pelayo 2015; Frauenberger et al. 2019; Shuayb 2020).

Thus, embracing collaborative practice is essential. This necessitates stakeholders, such as clients, architects, and project managers, actively engage disabled people as partners in development rather than mere recipients (Goodall 2010). Hence, meaningful dialogue between architects and users is essential; designers must observe and understand the interactions between people, objects, and spaces in natural settings (Altay et al. 2016). Collaborative research offers a framework for understanding this

interaction. This section will begin by reviewing the various terminologies associated with collaborative approaches and situating this research within them.

Collaborative research involves collaborating with participants rather than studying them and includes approaches such as participatory, emancipatory, and inclusive research (Peuravaara 2015). Participatory research emphasises collaboration between researchers and participants, actively involving them in the research process (Cornwall and Jewkes 1995), while emancipatory research aims to promote social change by empowering participants to challenge societal inequalities and take control of the research process (Gilbert 2004). On the other hand, inclusive research involves deeper participation of people with a learning disability beyond mere involvement (Walmsley and Johnson 2003). Given the scope of this doctoral research, which does not permit the broader social change sought in emancipatory research or the co-authorship and ownership characteristic of inclusive research, this study will adopt a participatory research approach, specifically Participatory Action Research, which emphasises active collaboration with people with a learning disability.

Participatory research engages non-research-trained individuals who represent or are part of the research beneficiaries (Vaughn and Jacquez 2020). It is seen as a move towards emancipatory research, challenging traditional power dynamics by regarding participants as co-researchers who contribute to knowledge generation (Cornwall and Jewkes 1995; Gilbert 2004). This approach guarantees that the research is informed by and pertinent to real-world contexts, thereby enhancing its applicability beyond academic settings (Vaughn and Jacquez 2020).

A sub-approach of participatory research is Participatory Action Research (PAR), which combines action research with participatory research. It involves the participation and leadership of people who are experiencing issues and who take action to produce social change through conducting systematic research to generate new knowledge (Cornish et al. 2023). It emphasises democratic processes in participation with others rather than research for research's sake (Vaughn and Jacquez 2020).

One of the most important features of PAR, when engaging with marginalised or vulnerable individuals, is its hands-on nature and its capacity to empower people to produce information and share knowledge on their own terms, using their own symbols, language, or art forms (Kindon et al. 2007), making it ideal for doing research with people with a learning disability. The active involvement and engagement of research participants define the inclusive and collaborative research practice that sets PAR apart from conventional research, where the outside researcher sets the agenda, decides on the questions to be asked and implements the survey for later analysis (Kindon et al. 2007; Schubotz 2019). Participatory Action Research's methodological uniqueness is about building relationships between people to connect theory and practice (Schubotz 2019).

Co-design with people with a learning disability

Historically, people with a learning disability have been passive subjects in research, with studies relying on the perspectives of doctors or carers, often emphasising a medical model over a social one (Abbott and McConkey 2006; Inglis and Cook 2011; Ćwirynkało et al. 2024). Such an approach conflicts with the social model of disability, as it may neglect the independence and advocacy of people with a learning disability. Researchers have raised concerns that relying heavily on proxies, such as carers, can overshadow the authentic voices of people with a learning disability (Sitbon and Farhin 2017). Engaging people with a learning disability in co-design aligns with the United Nations Convention on the Rights of Persons with Disabilities (CRPD) call to view disabled people as subjects with rights who actively participate in decisions affecting their lives (United Nations 2006c). Including them early in the design process makes their needs, desires, and priorities visible and actionable, thereby improving the relevance of design outcomes (González et al. 2020).

In response, co-design aims to amplify these voices, positioning people with a learning disability as experts by experience whose insights are crucial for achieving accessibility and inclusivity (González et al. 2020). Co-design is an approach to designing with people rather than for them. It is particularly effective when individuals with lived experience, communities, and professionals work together to address shared concerns (McKercher 2020). On the other hand, co-production in disability research brings together diverse groups, such as disabled people, their families, supporters, disability organisations, practitioners, and researchers, throughout the research process (Strnadová et al. 2020). While the terms co-production and co-design overlap, co-design typically refers to the collaborative design phase. In contrast, co-production spans the entire research process, including funding and dissemination, which is not the case in this research. Hence, the term co-design will be used in this thesis.

Co-design is a practice in which individuals collaborate or combine their knowledge, skills, and resources to undertake a design task using creative participatory methods (Zamenopoulos and Alexiou 2018; McKercher 2020). It has the potential to positively impact co-designers and their community, researchers, and organisations (Benz et al. 2024). In co-design, there is no one-size-fits-all approach nor a set of checklists to follow; instead, there are a series of patterns and principles that can be applied in diverse ways with different people (McKercher 2020). Consequently, this research tailors the co-design process by utilising a continuous cycle of feedback, consultations, and reflections with the participants through a collaboration with a local self-advocacy organisation, which will be discussed in detail later in this chapter.

Co-design is increasingly utilised in disability research as an essential component of ethical work grounded in human rights (Fraser-Barbour et al. 2023). It can greatly enhance research outcomes by incorporating end-user domain-specific knowledge and expertise (Heylighen et al. 2017; González et al. 2020). These contributions may vary from sharing use cases to providing insights into behaviours, new relationships, and unexpected scenarios, all grounded in lived experience (González et al. 2020).

Furthermore, expert users can play a vital role by enhancing accessibility legislation and offering insights that are frequently overlooked by standard regulations (Heylighen et al. 2017). Such contributions are invaluable for architects and professionals balancing inclusivity with other design imperatives.

However, this practice remains uncommon in architectural practice and research (Heylighen et al. 2017), particularly with people with a learning disability. Although their presence is an inevitable portion of the end-users in any community (Sherman and Sherman 2013) and their involvement was proven beneficial in other research disciplines (Strnadová et al. 2016). Yet, co-design with disabled people is sparse, partly due to a lack of guidance on effective participatory methods (Hendriks et al. 2015; Benz et al. 2024). Hence, this section draws on different disciplines to explore effective co-design strategies with people with a learning disability and adapts them to the context of architectural research.

Co-designing with people with a learning disability not only enriches the design process but also expands general design knowledge (Sarmiento-Pelayo, 2015; Sitbon & Farhin, 2017; González et al., 2020). The significance of co-design was noted by both researchers (Frauenberger et al. 2011; Gaudion et al. 2015; Hendriks et al. 2015; Sarmiento-Pelayo 2015; Shuayb 2020; Fraser-Barbour et al. 2023; Ćwirynkało et al. 2024) and disabled people (Castell 2012; Frankena et al. 2018; Fudge Schormans et al. 2019; Shuayb 2020).

Therefore, it is essential to ensure that the contributions of people with a learning disability in co-design processes are not only included but also genuinely meaningful. Every effort should be made to empower them to express their views and have a tangible impact on the outcomes of design projects, thereby fostering research environments that genuinely reflect their needs and preferences. This inspired the design of this research to actively involve people with a learning disability, ensuring that their lived experiences are at the forefront of the study.

Challenges and opportunities of co-designing with people with a learning disability

A learning disability does not impede an individual's ability to have aspirations, emotions, or ambitions (Mencap 2019). Many people with a learning disability are capable of working, living independently, forming relationships, and achieving academic qualifications (The National Health Service 2022). Their engagement in research is equally feasible.

The participation of people with a learning disability in research requires thoughtful support to navigate challenges (Walmsley 2004). Traditional research methods may not be suitable; they require adaptation to meet the specific communication and cognitive needs of participants (Gaudion et al. 2014; Gaudion et al. 2015; Hendriks et al. 2015). For example, some may experience difficulties with verbal expression, which can impact their ability to convey needs and ideas in words.

Consequently, engaging with people with a learning disability often requires a slower, more deliberate approach, which can conflict with the usual time constraints in typical research projects (Fudge Schormans et al. 2019; Thomas 2024). Limited-time projects make it less likely for people with a learning disability to engage fully in the research process, whilst longer timelines create an opportunity to explore new ideas and develop new skills (Fudge Schormans et al. 2019; Fraser-Barbour et al. 2023). Hence, effective co-design with people with a learning disability requires flexible timelines that allow for continuous adaptation based on participant feedback (Gaudion et al. 2015).

Although architectural research seldom includes people with a learning disability as active co-designers, evidence from other fields highlights the value of their involvement. Mutually, people with a learning disability expressed various motivations for engaging in research, including enjoyment, learning opportunities, increased confidence, and social interactions (Frankena et al. 2018). Furthermore, collaborative projects offer a valuable space for personal growth, skill development, making new friends, and building informal networks (Fudge Schormans et al. 2019; Ćwirynkało et al. 2024).

Hendriks et al. noted that a one-size-fits-all co-design approach may not be practical for people with cognitive or sensory impairments (Hendriks et al. 2015). An example of this is a series of design studies conducted by Gaudion et al., in which autistic adults with learning disability were engaged to explore their interactions with and reactions to domestic contexts. The study included three different sections: (i) creating a new garden, (ii) adapting an existing everyday object (a bubble-blowing vacuum cleaner), and (iii) adding artwork into the home. These studies varied in scale, the opportunity for action, and the degree of control over sensory elements. Rather than following a rigid, preselected methodological framework, each study was dynamically informed by the designer’s empathic understanding of the participants' responses (Gaudion et al. 2015).

On the other hand, some studies used structured preselected methods like focus groups, interviews, research journeys and photographic imaging to facilitate engagement (Barr et al. 2003; Fudge Schormans et al. 2019). For example, the “My Life in the City” Project by Fudge Schormans et al. involved people with a learning disability to examine their experiences of urban public spaces. The methodology included interviews, research journeys, GIS mapping, photography, drama-based workshops, and documentary filmmaking for dissemination. While academic collaborators predetermined the research methods, they were intentionally selected to promote co-production and ensure meaningful participation. The documentary component was directed by collaborators with a learning disability, highlighting their active role in shaping the project’s outcomes (Fudge Schormans et al. 2019).

This thesis synthesised these two approaches by combining preselected methods with adaptive techniques inspired by participants through regular consultations. This strategy ensured that, while the research framework provides structure, the actual application remains flexible and responsive to the needs of participants with learning disability.

Research Methodology

In this research, PAR provided the overall methodological framework, guiding the study's structure and focus. It centred the participants' perspectives and facilitated collaborative knowledge generation. Within this PAR framework, ethnography provided more profound insights into the participants' lived experiences, supporting PAR. This integration aimed to achieve two primary goals: actively involving people with a learning disability in the research process and ensuring that the research process remained responsive to participants' needs and grounded in their lived experiences.

Participatory action research

In this research, PAR provided the overall research framework, ensuring the study was participant-centred. Additionally, it supported the identification of the architectural barriers experienced by people with a learning disability and the development of potential design solutions.

In her book Participatory Action Research, Alice McIntyre identified four core tenets that underlie most PAR projects (McIntyre 2008, p.1). These tenets align closely with the research design as follows:

- **A collective commitment to investigate an issue**
  This research is driven by a commitment to exploring how people with a learning disability can be actively involved in architectural research, identifying the barriers they face in the built environment, and providing insights for solutions.
- **A desire for self and collective reflection to gain clarity about the issue**
  The study incorporates continuous reflections, allowing the researcher to self-reflect and collectively reflect, evaluate, and refine each stage of the research process with the participants.
- **A decision to take action leading to solutions that benefit those involved**
  The study aimed to develop a methodological framework that could enhance the experiences of people with a learning disability within architectural research. Additionally, it offered architectural insights that tackle the challenges they face in the built environment.
- **Building alliances between researchers and participants**
  A collaboration with a self-advocacy organisation was established prior to data collection and has been maintained throughout the research. This collaboration supported participant recruitment, engagement, and self and collective reflection, which will be discussed in detail later in this chapter. It also led to alliances beyond the formal scope of the research, contributing to broader industry and community engagement.

Participatory Action Research's commitment to experiential knowledge to address issues stemming from unequal social systems aligns with the research aims, which placed the voices and experiences of people with a learning disability at the heart of the research (Cornish et al. 2023). McIntyre also described PAR as a cyclical process

involving exploration, knowledge construction, and action (McIntyre 2008). In this research, each stage was built on the previous one through cycles of consultations and collaboration, which will be discussed in detail in the research design section.

Ethnography

Ethnography involves observing and interacting with participants, primarily through informal and formal observational techniques, field notes, and personal interactions (Bhattacherjee 2012). In design research, ethnography offers an in-depth understanding of people's behaviours, beliefs, and preferences within their natural environments, bridging the gap between what people say they do and what they actually do (Ireland 2003; Lucas 2016). Hence, it allowed the researcher to observe behaviours that might not emerge during structured research activities, adding depth to the insights gathered through the different research stages.

Additionally, ethnography offers insights into the lived experiences of individuals and communities; it supports the design of spaces that are more empathetic, inclusive, and functional (Cranz 2016). It offers a fresh perspective on design, enabling more human-centred and contextually relevant design solutions (Plowman 2003), aligning with the research aim and approach.

People with a learning disability often experience interactions controlled by others, especially in settings where complex research language is used, which may lead them to respond in ways they think are expected (Harris 2022). Accordingly, ethnography was crucial for establishing rapport with the learning disability community, facilitating informal interactions that alleviated these effects and encouraged participants to communicate more openly and authentically.

Additionally, the ethnographic approach contributed to enhancing the researcher's communication strategies with people with a learning disability. It also supported the fostering of empathy, which is essential for a participant-centred, inclusive research environment. Finally, ethnography helped to validate findings from the various research stages by grounding them in participants' lived experiences.

Research Design

The research consisted of four stages aimed at engaging participants in exploring challenges within the built environment and collaboratively developing solutions. Each stage was supported by three components: a literature review to synthesise existing guidance on conducting collaborative research with people with a learning disability, collaboration with a self-advocacy organisation for people with a learning disability, and the researcher's employment in the same organisation to gain hands-on experience in communicating with people with a learning disability. All these components worked together in a structured, iterative manner to inform each research stage, ensuring the accessibility of the research process and relevance to the lived experience of people with a learning disability. Additionally, the architectural and methodological insights

from each stage informed the following one in a continuous feedback loop to enhance the accessibility of the research process and ensure an inclusive research environment (see Figure 3-1).

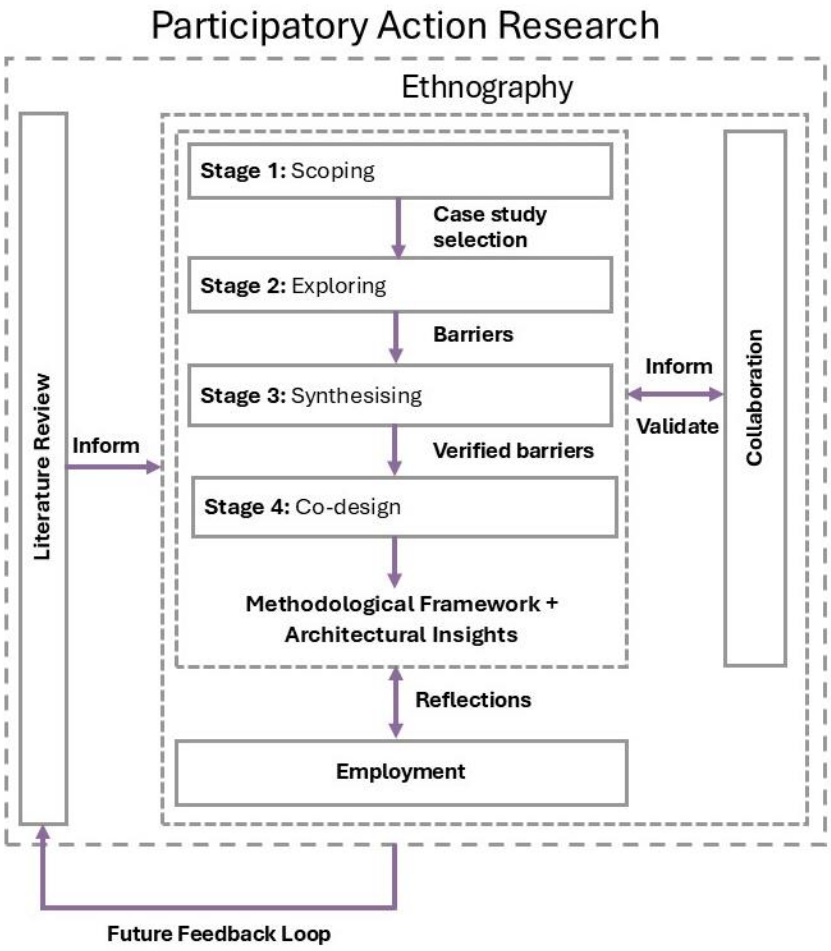


Figure 3-1: Research design

- **Stage 1: Scoping**

This stage aimed to gather initial insights into the participants' experiences of the buildings and to select the case study. Semi-structured interviews were used to understand their preferences regarding various buildings in Cardiff, Wales.

- **Stage 2: Exploration**

The aim was to explore how various architectural elements impacted the participants' ability to access, navigate and use spaces. In this stage, walking interviews were conducted to identify the specific barriers encountered in the co-selected case study.

- **Stage 3: Synthesising**

This stage aimed to review, verify, and deepen the understanding of the barriers identified in the previous stages. This was achieved through three focus groups; the collective reflection in this setting helped refine and prioritise the issues that most affected the participants.

Stage 4: Co-design

The final stage aimed to co-design architectural solutions to the barriers prioritised in the previous stage. This was achieved through three co-design workshops utilising creative methodologies.

Additionally, three main components supported each stage:

1. **Literature Review**

The research stages commenced with a review of the relevant literature to enhance the accessibility of the methods utilised at that stage. Furthermore, the literature review supported the selection of topics explored in each stage.

2. **Collaboration**

The research commenced through a partnership with a local self-advocacy organisation to assist in recruiting participants, details of which will be provided later in this chapter. This collaboration aimed to ensure inclusivity within the research environment and validate results through consultations.

3. **Employment**

Throughout the research, the researcher worked for the same organisation as a workplace Personal Assistant (PA). This helped to build rapport with the learning disability community in Cardiff and enhance awareness of its needs and challenges through observations and informal interactions, which will be elaborated upon later in this chapter and Practice Note 1.

Chapters 4, 5, 6 and 7 describe this participant-centred fieldwork. Each chapter consists of four sections: preparation, data collection, analysis, and findings. Preparation includes a literature review on data collection methods and consultations about their accessibility, in addition to the ethical application process. Some stages have specific preparation phases detailed in the chapters. The data collection section involved collecting data using the chosen methods, as well as through observations and informal conversations outside of structured activities. The analysis section included interpreting the dataset using reflexive thematic analysis to identify key patterns and insights. Finally, the findings section includes both the methodological and architectural insights of each stage. This section concludes with consultations to verify the findings. The verified findings informed subsequent stages and contributed to the final methodological framework and architectural insights (see Figure 3-2).

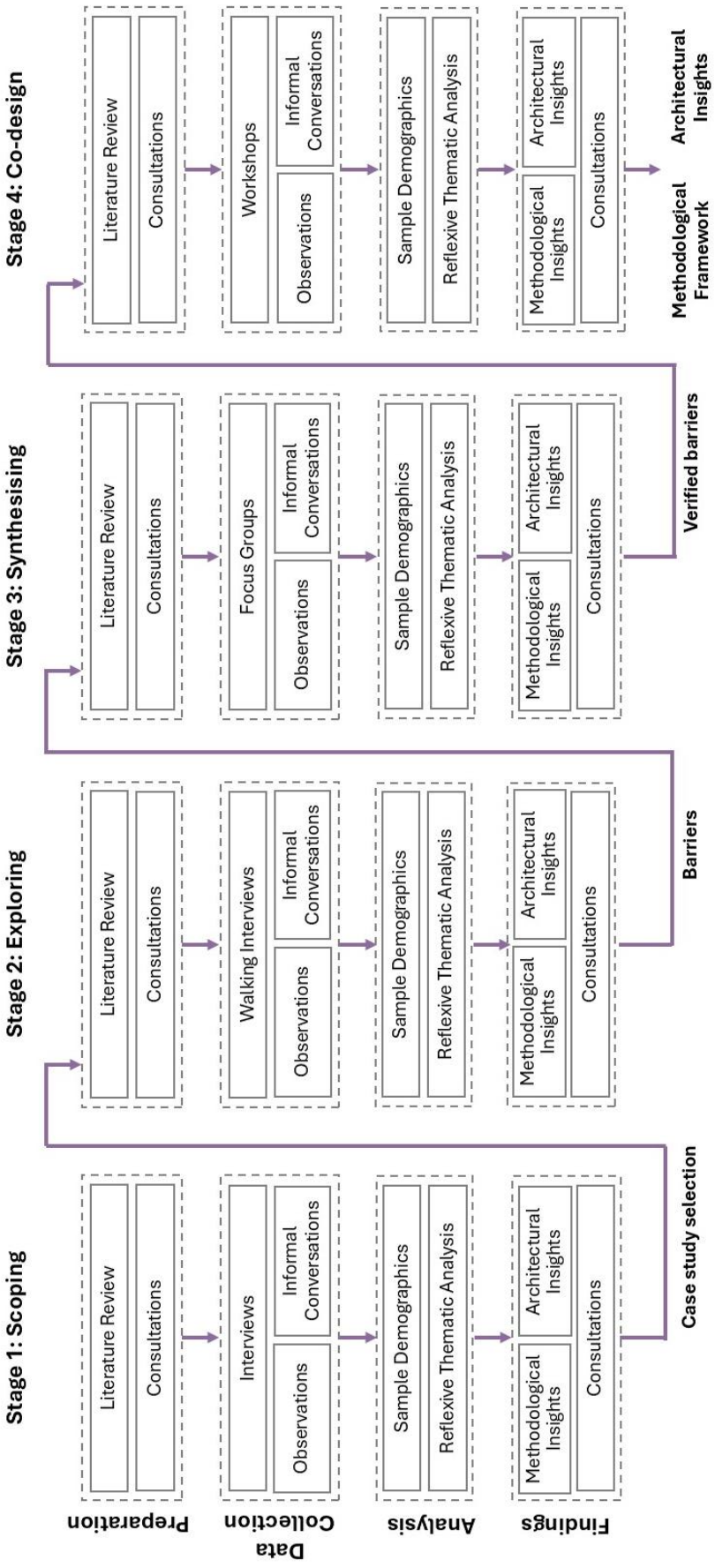


Figure 3-2: The structured iterative manner of the research stages

Data Collection Methods

The various research stages employed a range of methods aimed at ensuring the active participation of people with a learning disability, outlined as follows:

- **Stage 1:** Semi-structured interviews to gather initial insights into participants' experiences and preferences regarding the built environment.
- **Stage 2:** Walking interviews to explore participants' interactions with architectural spaces and identify barriers and accessibility challenges.
- **Stage 3:** Focus groups to collaboratively validate the barriers identified in the previous stages.
- **Stage 4:** Co-design workshop to design potential architectural solutions for the validated barriers.

Each data collection method employed different data collection and data recording techniques, tailored to the specific method. All will be discussed below; Table 3-1 summaries them and illustrate their correspondence to the different stages.

Table 3-1: A summary of the data collection methods, techniques, and recording utilised in this research

Research Stage	Stage 1: Scoping	Stage 2: Exploring	Stage 3: Synthesising	Stage 4: Co-design
Approach	Qualitative Research			
Methodology	Participatory Research/ Ethnography			
Data collection methods	Interviews	Walking interviews	Focus groups	Workshops
	Observations/ Consultation/ Informal conversations			
Data collection techniques	Sorting	Sorting/ Wayfinding activities	Voting	Model making
Data recording	Audio recording/ Note-taking/ Photography			

Given the active involvement of people with a learning disability, these data collection methods were customised to create an accessible and inclusive research environment. This customisation process was inspired by literature reviews, collaboration, and employment. For example, the utilisation of simplified language, visual aids, and flexible timelines to accommodate a variety of needs. These measures ensured that participants could engage meaningfully and contribute insights that directly shaped the study's findings. Further details on these adaptations and their implementation can be

found in Chapters 4, 5, 6 and 7. Below is the rationale for utilising these specific data collection methods.

Interviews

Interviews are a versatile and flexible method, allowing for in-depth data collection and providing researchers with a detailed understanding of participants' thoughts, feelings, beliefs, and behaviours (Ireland 2003; Niezabitowska 2018). By fostering personalised discussions, interviews enable researchers to capture diverse viewpoints and gain insight into participants' lived experiences (Bhattacherjee 2012; Niezabitowska 2018), which was essential for answering the research questions.

Interviews are typically categorised as structured, semi-structured, or unstructured. Semi-structured interviews, selected for this research, utilise open-ended questions that encourage participants to express themselves freely. This format provides a balanced structure while allowing flexibility, making it ideal for gathering rich, qualitative data from people with a learning disability (Niezabitowska 2018).

Face-to-face interviews were chosen for this research, as personal interaction facilitates clearer communication, a crucial factor when involving participants with learning disability (Mencap 2016). Further measures to enhance accessibility during the interviews will be addressed in the next Scoping Chapter.

Walking interviews

Walking interviews, walk-along or go-along, are a relatively new and innovative qualitative method, with roots in ethnography, anthropology, and geography (King and Woodroffe 2019). It entails researchers and participants talking while walking together, mixing interviews and participant observations (Kinney 2017; King and Woodroffe 2019; Research Methods for Society and Mental Health 2024). This renders it a powerful and unique approach to engaging with space and place, as well as the significant and nuanced meanings, experiences, values, and understandings of individuals in these contexts (King and Woodroffe 2019), hence, it was utilised in this research to capture the experiences of people with a learning disability within architectural spaces.

Moreover, walking interviews are suitable for this research due to their inclusive nature. Unlike traditional sit-down interviews, walking interviews promote a sense of partnership and diminish power imbalances, making them ideal for participants who may feel vulnerable or anxious in conventional interview settings (Kinney 2017; King and Woodroffe 2019). They can offer participants a greater sense of control and comfort (King and Woodroffe 2019; Research Methods for Society and Mental Health 2024), promoting inclusivity and building rapport, which is crucial for participants with learning disability.

By permitting participants to navigate the environment, walking interviews facilitate a more enriching, multisensory interaction with their surroundings (King and Woodroffe 2019). Consequently, they generate richer data as interviewees are prompted by the

meanings and connections to their surrounding environment, which reduces the likelihood of providing socially desirable responses and allows for more spontaneous insights. It is logical to discuss the places the interviewees are interested in while they are there (Evans and Jones 2011).

This aligns with the research's goal of capturing participants' holistic experiences within the built environment. Additionally, being in the environment could help the participants overcome memory-related challenges, reduce potential inhibitions about what is expected in research settings, and uncover knowledge that may not be readily articulated. Walking interviews can be used in conjunction with other qualitative methods, such as interviews and observation (King and Woodroffe 2019). This is the case in this research, which will be discussed in detail in Chapter 5.

Observation

Observation allows the researcher to collect data on both the physical characteristics of environments and the behaviours of users within those spaces (Niezabitowska 2018). In this study, observation played a critical role in capturing the interactions of people with a learning disability within architectural spaces. Two types of observation were utilised in this research. Firstly, structured observation, which focused on specific variables and employed a predefined plan for data collection (Akšamija 2021). This makes them suitable for the structured research stages, where targeted insights into participant interactions with architectural elements are gathered. Hence, they were utilised during the walking interviews, where the spatial journey shaped the structure of the observation, enabling the researcher to respond to key points of interest as they emerged.

Secondly, unstructured observation, which allows data to be collected organically, capturing participants' behaviours and interactions without focusing on predetermined variables (Akšamija 2021). This type was employed during employment to observe participants' spontaneous interactions with the built environment, including their responses to different settings, barriers encountered, and reactions to new spaces. Consequently, it provided in-depth insights into participants' experiences in natural settings, which were essential for exploring inclusive and empathetic architectural insights.

Focus groups

Focus groups are a valuable research tool that allows for in-depth exploration of opinions and perspectives within a specific group. They involve a facilitator guiding a discussion among a small group of participants, typically between six and ten individuals, on a particular topic or issue (Bhattacherjee 2012). Focus groups are commonly used to deepen the understanding of issues identified in individual interviews or surveys, as they provide a more nuanced and comprehensive perspective (Niezabitowska 2018). In this research, focus groups were used to validate the findings

from the interviews and walking interviews, enabling a thorough examination of the architectural barriers identified.

The interactive nature of focus group discussions enables participants to develop each other's ideas, producing rich, multi-dimensional data (Lucas 2016). However, a potential challenge in focus groups is the risk of group dynamics affecting individual responses, which may lead to groupthink or allow dominant personalities to overshadow others (Bhattacherjee 2012; Lucas 2016). To address this, a structured agenda and careful moderation were employed, ensuring that each participant had equal opportunities to contribute, which will be discussed in detail in Chapter 6.

Workshops

Workshops are a widely used technique in design processes, enabling participants to develop solutions for specific project challenges collaboratively (Niezabitowska 2018). It involves a structured arrangement in which a group of people acquires new knowledge and engages in creative problem-solving (Ørngreen and Levinsen 2017). Workshops are especially effective for exploring different design solutions and assessing the advantages and disadvantages of each option (Niezabitowska 2018).

Typical architectural workshops often involve groups of designers working on predefined project requirements (Niezabitowska 2018). Conversely, workshops in this research were designed to capture insights from non-designer participants. They served as a platform for developing inclusive design solutions directly informed by the participants' experiences. This allowed for a user-centred approach, ensuring that solutions reflect the actual needs and preferences of end-users rather than assumptions made by designers.

Focus group vs workshops in this research

This research employed both focus groups and workshops, with each method tailored to distinct research objectives. Focus groups were used to validate and explore challenges in the built environment, while workshops were utilised to co-design architectural solutions. The differences between these methods are summarised in the following table (see Table 3-2).

Table 3-2: The distinct positions of focus groups and workshops in this research

Aspect	Focus groups	Workshops
Aim	Validate challenges in the built environment identified in the previous stages	Co-design architectural solutions for challenges previously identified
Structure	Guided discussion	Hands-on activities
Researcher role	Guide discussion	Direct and support activities and group tasks
Outcomes	Qualitative data	Tangible outcomes, for example, models and maps

The previously discussed data collection methods were employed in the structured research stages. However, data were also collected through consultations and informal conversations, which resulted from collaboration with the self-advocacy organisation and employment for them, in addition to observations, as previously discussed.

Consultations

Regular consultations with the organisation, through formal interactions, were embedded in all research stages, facilitated by collaboration with the self-advocacy organisation. The consultations had two roles during each stage: first, they informed the data collection of the stage, ensuring the accessibility of the data collection methods and the inclusivity of the research environment. Second, the validation of each stage's findings. This cycle of consultations underscored the research's flexibility and dedication to inclusivity and participant engagement.

Informal conversations

Informal conversations, also known as informal interviews, have been recognised as a valuable qualitative method central to social inquiry and qualitative research (Swain and King 2022). Although they have limited formal structure, informal conversations offer a useful way to confirm findings, allowing for real-time reflections that enhance the insights generated through structured methods (Moeller et al. 1980; Swain and King 2022). The informal conversations were embedded throughout all the research stages, facilitated by the collaboration with and employment at the self-advocacy organisation. They provided a flexible, naturalistic method to validate and enrich the data gathered through structured research stages.

In this research, informal conversations played a vital role in building rapport between the researcher and participants. Such trust-building was crucial, as it encouraged participants to share their experiences openly, fostering an environment where they felt understood and valued. These informal conversations also enabled the researcher to look beyond the structured data, capturing nuanced insights while allowing for reflections on the research findings. In addition to fostering self-reflection, these conversations created a space for collective reflection among the researcher, the organisation, and the participants. Integrating informal conversations with structured activities ensured that participants' voices were authentically represented, supporting the overarching aim of developing inclusive architectural insights.

Data collection techniques

This research employed a variety of techniques tailored to the diverse methods utilised throughout the various stages of data collection (see Table 3-1). Each technique was chosen to optimise data richness, ensure accessibility, and foster participants' engagement. The rationale behind using each technique is discussed below.

Sorting

Sorting is a common qualitative technique where participants are asked to categorise a set of cards, often with words or images, into predefined or participant-defined categories. In a directed sort, the researcher specifies the categories, for example, a 5-point rating scale from highly preferred to least preferred. While in an open sort, participants establish their own categories (Groat and Wang 2013). Directed sort was utilised in stages 1 and 2. In both stages, the sorting technique helped reduce the formality of the activity and encouraged participant engagement. It also helped participants overcome memory issues and recall their experiences within different venues. Ideal, therefore, to meet the participants' needs.

Wayfinding activities

Wayfinding and navigation were the most recurring barriers in the literature on accessibility for people with a learning disability. Hence, wayfinding tasks were utilised multiple times during the walking interviews. During each task, the wayfinding and navigation process was observed and assessed. For example, the ease of reaching a destination, the language used, and the cues utilised, which will be discussed in detail in Chapter 5. The wayfinding activities employed in this research differ from previous wayfinding studies, where participants were asked to create a map after completing a task or answer questions about their wayfinding experience upon finishing a task. Both approaches would be inaccessible to people with a learning disability (Salmi 2007), hence, they were avoided.

Voting

Voting was introduced during the focus groups to prioritise the various themes that emerged from the walking interviews. This allowed participants to express their opinions on which topics they considered most relevant or impactful, thereby providing a collective sense of direction for the subsequent stage. Employment observations revealed that voting was a common technique within meetings of the learning disability community. Using it during the focus groups fostered a more structured and participant-driven approach to the co-design workshops, which will be discussed in detail in Chapter 6.

Model making

Model making was employed during the co-design workshops in stage 4 to provide participants with a simple way to explore and communicate spatial ideas. Physical models are widely recognised in co-design for their ability to externalise abstract concepts, a process that encourages dialogue among contributors who may have limited drawing or verbal expression skills (Sanders and Stappers 2008). Research in inclusive architecture reveals that tactile, reconfigurable models enable users with impairments to pinpoint barriers and suggest alterations that may not be apparent in conversation alone (Allen et al. 2013; Vermeersch et al. 2018). Dalton noted that creating and describing a model offered safety and reduced pressure for creators,

resulting in rich data as participants freely shared their thoughts and emotions (Dalton 2020). Rendering it a perfect tool for working with vulnerable groups.

Data recording

Three data recording techniques were employed throughout the four stages to ensure the accurate documentation of the collected data, including audio recording, note-taking, and photography.

Audio recording

Audio recording was used throughout all research stages. It is a commonly employed data collection method in qualitative research, particularly in interviews, focus groups, and observational studies. Qualitative researchers prioritise capturing the nuances of participants' responses, including the language and concepts they utilise when discussing their experiences and perspectives. Thus, an accurate record of interactions is essential (Braun and Clarke 2013). The audio recording offered an accurate account of their responses, surpassing mere note-taking. It guaranteed that no significant details or nuances were overlooked during the data collection and subsequent analysis.

Note-taking

Note-taking is another critical data collection strategy in qualitative research, which was also utilised in all the research stages. It serves as either a supplementary or primary means of recording information during interviews or observations (Yin 2016). In this research, it complemented the audio recordings by enabling the researcher to document her interpretations of non-verbal cues, such as body language and facial expressions, which were essential for grasping the full context of participants' responses. These cues enabled the researcher to interpret the verbal responses more accurately and gain insights into the participants' emotional reactions and engagement. Additionally, it was beneficial during the informal interactions and observations.

Photography

Photography was also used throughout all the research stages, serving different roles. It was employed to follow up on the participants' comments after the activity, as it may not have been feasible to do so during the activity. For example, during the focus groups, if a participant highlighted a specific feature as a barrier, it was photographed later. Additionally, it was utilised to capture a visual record of how participants engaged with the tasks, documenting their outputs. Lastly, photography was utilised to capture insights outside the structured activities during employment.

Sampling

The study was conducted in Cardiff, Wales, and included adult participants with a learning disability who either lived in the city or visited it on a regular basis. The eligibility questions in each stage ensured that participants were eligible before initiating data collection. Additionally, they included a question on co-occurring conditions, considering that 75% of disabled people experience more than one type of impairment

(Sport England 2016). While some participants had co-occurring conditions such as autism or ADHD, these were not a focus of the analysis. The research was concerned with the lived experiences of people with a learning disability in navigating and engaging with the built environment, regardless of any additional diagnoses. The presence of co-occurring conditions did not influence the inclusion criteria or the interpretation of findings, as the analysis was grounded in the collective insights shared by participants during the study.

The sampling technique used in this research was convenience sampling, a non-probability technique where participants are selected based on accessibility, availability, and practicality (Bhattacherjee 2012). This approach was chosen as recruitment occurred through the organisation, limiting participation to individuals connected with or accessible through this organisation. While this method may introduce some selection bias, it was deemed appropriate given the study's focus and the challenges of recruiting people with a learning disability.

Given the qualitative nature of the study and the application of reflexive thematic analysis, the sample size was established according to the principle of data saturation (Creswell and Creswell 2018). It started with a small number of participants per stage, while the reflexive thematic analysis was conducted in parallel with data collection to monitor the emergence of new themes. If data saturation was not achieved, the sample size was expanded iteratively to ensure robust and comprehensive findings that accurately reflected participants' experiences and perspectives. Additionally, the sample size recommendations by Braun and Clarke in qualitative research were acknowledged (Braun and Clarke 2013) (see Table 3-4).

Table 3-3: Sample size in each research stage, following the recommendation of Braun and Clarke

Data collection method	Recommendations for a medium project (or one study in a large project)	Application in this research
Interviews	10-20 interviews	Stage 1 Interviews: 10 interviews
		Stage 2 walking interviews: 18 interviews
Group interviews	3-6 focus groups	Stage 3 focus groups: 3 focus groups (3-5 participants, N total = 12)
		Stage 4 workshops: 3 workshops (4-5 participants, N total=14)

Data Analysis

The data collected through different stages were analysed using Reflective Thematic Analysis. Reflexive Thematic Analysis is one of the varied approaches to conducting

Thematic Analysis (Byrne 2022). Thematic analysis is a qualitative approach that effectively identifies and interprets patterns within qualitative data (Clarke and Braun 2017). By focusing on the meaning within a dataset, it enables the researcher to perceive and understand collective or shared meanings and experiences (Braun and Clarke 2012). Thematic analysis is best thought of as a spectrum of methods, from types that prioritise coding accuracy and reliability to reflexive approaches that emphasise the inescapable subjectivity of data interpretation (Braun and Clarke 2021). This research inclines towards the latter end of the spectrum, acknowledging the researcher's immersion within the learning disability community during and beyond the data collection.

Reflexive thematic analysis is a readily accessible and theoretically flexible interpretative approach to qualitative data analysis, facilitating the identification and examination of patterns or themes within a given dataset (Braun and Clarke 2012). In the reflexive thematic analysis, the researcher acknowledges and reflects on the ways that their values, experiences, interests, and social location inform the analysis being undertaken (Terry and Hayfield 2020), echoing the adaptive positionality employed in this research. Reflexive thematic analysis is creative and subjective, with researcher subjectivity understood as a resource (Braun and Clarke 2019). It depends on the researcher's subjective, active engagement with their data in relation to the research question. In this approach, themes are not perceived to 'emerge' from the chaos of data but are constructed, tested, and refined through a series of iterative phases (Terry and Hayfield 2020).

This approach integrated participant insights with observational data, ensuring robust, participant-centred findings. It provided a nuanced understanding of the lived experiences of people with a learning disability. The method's iterative and reflexive nature guided the analysis, informed by both the data and the researcher's reflections. Reflexive thematic analysis was consistently applied across all research stages, remaining sensitive to participants' voices while acknowledging the researcher's influence on the process due to her employment experience.
The reflexive approach involves six recursive phases as follows (Terry and Hayfield 2020; Braun and Clarke 2021; Campbell et al. 2021).

1. **Familiarisation**: This phase involves immersive and purposeful engagement with the dataset by reading, re-reading, and taking notes on initial impressions, observations, and ideas related to the research questions. This foundational step ensures a deep familiarity with the data before analysis begins. In this research, it included transcribing audio recordings, organising and categorising photos, and reading and re-reading datasets and field notes. Additionally, it involved some stage-specific actions, such as illustrating the participants' routes during the walking interviews and analysing the design decisions made during the co-design workshops.
2. **Generating codes**: This phase involves creating concise and meaningful labels for relevant data segments, guided by the research questions. This iterative process ensures rigorous engagement with the dataset and lays the groundwork for theme

development. It also includes labelling and organising data items into meaningful groups following the research aims.

3. **Constructing candidate themes**: Using codes as building blocks, researchers cluster related codes or promote particularly rich ones into candidate themes. This step focuses on identifying patterns and central organising concepts that best address the research questions. In this research, the themes were categorised into methodological and architectural insights, following the research aims. Additionally, during the analysis of the walking interviews, the architectural insights were grouped into tangible and intangible insights, a categorisation that continued into the following stages.
4. **Reviewing themes**: The candidate themes are evaluated against the dataset and research questions to ensure coherence and relevance. This step involves refining, merging, or discarding themes while iteratively engaging with the data. This phase ensures that there is sufficient data to support a theme and merges overlapping themes.
5. **Naming and defining themes**: Themes are named to capture their central organising concepts and are defined with clear boundaries, including sub-themes and their relationships to each other. These definitions form the foundation for the analysis write-up. During this phase, the data and the identified themes are cycled to organise a story.
6. **Writing the report:** The final phase involves integrating themes, data extracts, and analytical insights into a cohesive narrative that addresses the research questions and situates findings within the existing literature. Writing is recursive, advancing both analysis and interpretation. In this research, the data was crafted in line with the research aims of developing a methodological framework and providing architectural insights. It encompassed writing that goes beyond mere descriptions of the themes, contextualising the findings within the existing literature.

After conducting these steps for each research stage, they were repeated throughout all the results collectively to generate a holistic methodological framework and architectural insights, which will be discussed in Chapter 8.

Reflexivity and positionality

A key feature of reflexive thematic analysis is the focus on reflexivity, particularly the researcher's positionality in the research process. In this study, the researcher's insider/outsider status influenced both the data collection process and the interpretation of findings. As an insider, the researcher had access to the community through employment. This fostered trust and rapport, enabling participants to feel comfortable sharing their experiences that extended beyond the research focus. However, this also meant that the researcher had to be mindful of assumptions and biases stemming from prior knowledge of the community.

As an outsider, the researcher's fresh perspective facilitated a critical distance, especially in the early stages of the research. This distance fostered an open-ended exploration of the data without presuming prior knowledge of participants' needs and

experiences. Throughout the data collection and analysis process, these dual perspectives (insider and outsider) were continually reflected upon and navigated with care to ensure that the researcher's influence on the data was recognised.

To manage these dual perspectives, the researcher adopted distinct positionalities to ensure a comprehensive understanding of participants' experiences (see Table 3-3). During the structured research stages, the researcher took on an active and engaged role by facilitating interviews, focus groups, and workshops. This involvement encouraged participants to share their insights in a collaborative environment where they felt comfortable contributing to the co-design process.

In contrast, the researcher adopted a participant-observer role during informal interactions, concentrating on observing participants' interactions in naturalistic settings. Rather than being entirely "passive," this positionality involved a distanced yet attentive stance that minimises direct influence while allowing the researcher to gather authentic, unbiased insights into participants' everyday behaviours and interactions, often uncovering subtleties that formal research settings might overlook.

Table 3-4: Researcher positionality throughout the research process

Activity	Position	Key features	Purpose
Structured research activities	Active role	-Direct engagement with participants -Facilitation of structured research activities and guiding discussions	Foster collaboration and encourage participants to share insights and co-create solutions
Informal interactions (employment)	Participant observer role	-Observing participants in naturalistic settings -Minimising influence on participants' behaviours -Building rapport	Capture unbiased, naturalistic data that may not emerge during structured activities
Overall approach	Adaptive positionality	- Balances active engagement and participant observation -Ensures a comprehensive understanding of participant experiences	Integrate participant-centred insights with naturalistic observations for robust findings

The balance between roles was not static. There were days when the researcher shifted between positionalities within hours, for instance, working as a PA in the morning 'participant-observer', then transitioning into an 'active' role to conduct a walking interview or facilitate a focus group later in the day. These shifts were often conscious and situational.

These positional shifts not only reflected the adaptive nature of the methodology but also respected participants' agency, enhancing the inclusivity and responsiveness of the research process. Additionally, it enabled the researcher to balance active

engagement and distanced observation, integrating participant-centred insights with contextualised naturalistic observations. Together, these approaches enriched the study's findings and ensured that the results were grounded in a nuanced understanding of participants' lived experiences.

Data Collection Preparation

This section outlines the collective preparations for data collection, including approaching the community, and the study's ethical implications. The specific preparations for each stage will be discussed in the respective chapters 4, 5, 6 and 7.

Approaching the community

The fieldwork began with approaching the community, which was crucial for establishing rapport and ensuring meaningful engagement with the participants. However, the researcher does not have a learning disability or any previous connections to this community. Therefore, three strategies were employed to build relationships and gain insight into the community: volunteering, collaboration, and employment.

Volunteering

The first strategy to approach the community was through volunteering. Many ethnographers conducted research as "volunteer ethnographers" (Tinney 2008; Flachs 2013; Garthwaite 2016; Hill O'Connor and Baker 2017). They highlighted significant benefits of the role of the volunteer ethnographer, including insider perspective, new insight into the day-to-day experiences and a more effective qualitative understanding of community (Flachs 2013; Garthwaite 2016; Hill O'Connor and Baker 2017). However, the approach presents some challenges, for example, writing up, the negotiation of relationships, practices, emotions and maintaining boundaries (Tinney 2008; Garthwaite 2016). Hence, it was not utilised on its own in this research.

The researcher volunteered for a befriending project in Cardiff before the start of the data collection. This project aims to help people with a learning disability overcome loneliness and live fulfilling lives through a variety of social activities. The researcher was paired with a friend who had a learning disability, based on shared interests, and together, they participated in various leisure activities over time for a little over a year.

While this experience was invaluable as a preliminary insight into the lives of people with a learning disability, it did not directly support recruitment or facilitate data collection. Given the project's limited timeframe and its focus on fostering friendships rather than research engagement, the volunteer only engages with one individual with a learning disability, except for some group activities. Hence, opportunities for observations or reflections were constrained. Nonetheless, this volunteering experience provided a foundational understanding of participants' daily lives and challenges, informing the researcher's approach in different stages of the research.

Collaboration

The second strategy for approaching the community was through collaboration. Various non-profit and charitable organisations across Wales, particularly in Cardiff, that support people with a learning disability were contacted to explore potential partnerships, which was recommended in previous research (Nind 2008). Individual representatives from these organisations, along with researchers from the host university with expertise in collaborating with people with a learning disability, were also contacted. The organisations contacted included:

- All Wales People First
- Autism Alliance
- Autism Spectrum Connections Cymru ascc
- Attitude is everything
- Cardiff Chameleons Gateway Club (local Mencap group)
- Cardiff People First
- Disability Wales
- Down Syndrome Association
- HFT Learning Disability Allies
- Learning Disability Wales
- Mencap
    - Mencap Research and Impact Team
    - Mencap Wales
- National Autistic Society

Following this outreach process, a successful collaboration was established with a self-advocacy organisation run by and for people with a learning disability in Cardiff. The organisation has approximately forty core members, with an additional 20-30 people regularly attending their events. Additionally, it maintains connections with an extended network of 200-300 individuals through associated organisations. The organisation only covers adults with learning disability in Cardiff, with some exceptions in specific projects.

As a self-advocacy organisation, they aim to empower people with a learning disability to speak out on the issues impacting their lives. Self-advocacy provides opportunities for individuals and groups with learning disability to develop their confidence, enabling them to advocate for human rights and challenge oppression in a disabling society (Goodley et al. 2003). Self-advocates, like all disabled people, are best placed to explain the effects of a disabling society (Goodley 1997).

Since the late 1990s, self-advocacy organisations have advocated for the inclusion of people with a learning disability in research, not just as participants, but also as researchers contributing to the design and execution of research (Tuffrey-Wijne and Butler 2010). Collaborations with self-advocacy organisations have become standard practice, providing invaluable support in recruitment, consultation, and accessibility

advising (Walmsley 2001; Tuffrey-Wijne and Butler 2010; Strnadová et al. 2016; Armstrong et al. 2019; Walmsley 2023).

- Facilitator recruitment

To foster an inclusive and supportive research environment, the organisation recommended recruiting a facilitator with a learning disability. The facilitator's role was to ensure the accessibility of the research environment and facilitate the recruitment process; further details on the role will be provided in Chapters 4, 5, 6, and 7, as well as in Practice Note 3. This facilitation aimed to create an inclusive research environment where participants could freely share their perspectives.

Facilitator recruitment interviews were conducted with eight candidates, from whom Hamida -a pseudonym chosen by the facilitator- was selected. Hamida has been a project officer at the organisation since 2016 and works for another self-advocacy organisation in Wales. Her extensive experience and presence in the learning disability community in Cardiff made her a familiar, trusted figure, which helped facilitate the recruitment process and foster a comfortable environment for participants. To the best of the researcher’s knowledge, this facilitation has never been carried out in any previously published architectural research. However, it was recommended in other fields such as health and wellbeing, disability studies and advocacy studies (Strnadová et al. 2016).

The involvement of a facilitator with a learning disability aligns with the principles of ‘inclusive research,’ which encourages the active engagement of people with a learning disability beyond traditional participant roles (Walmsley 2001). Although this study does not fully embody an inclusive research approach, it incorporates many of its principles by positioning the facilitator in a role that extends beyond typical participation (Woelders et al. 2015). Notably, inclusive research encompasses a range of involvement levels, from consultative to active research roles (Strnadová et al. 2016).

Employment

The last strategy utilised for engaging with the community was employment. After establishing collaboration with the organisation, they advertised a vacancy for a Workplace Personal Assistant (PA), supported by the United Kingdom Government’s Access to Work program. This is a government initiative designed to help people get or stay in work if they have a physical or mental health condition or disability (United Kingdom Government [no date][b]).

Since all frontline staff members at the organisation have a learning disability, the organisation employs a pool of PAs. Some are assigned to specific employees, while others work on an ad hoc basis. The advertised position was for a designated PA to support Hamida, the facilitator in this research. She interviewed the researcher for the role. The researcher was then accepted for the position and continued to work as Hamida’s PA even after the fieldwork was concluded.

Working as Hamida's PA provided the researcher with unique insights into the accessibility needs and challenges faced by people with a learning disability. It also enabled the researcher to build rapport with Hamida and the learning disability community in Cardiff. Observing daily organisational practices, engagement, and events enhanced the researcher's understanding of the community's dynamics. This direct involvement enriched the researcher's perspective on accessibility and inclusivity, ultimately informing the study's goals of developing participant-centred architectural insights; further details will be discussed in Practice Note 1. This reciprocal relationship also enhanced the power dynamics between Hamida and the researcher.

Ethical implications

Working with vulnerable adults presents several ethical issues that must be carefully managed. To ensure a safe and supportive research environment, each research stage obtained independent ethical approval from the host university, facilitating reflection and enhancements after each stage. All participants provided informed consent prior to data collection; however, the researcher's employment within the same organisation as participants and the facilitator's role in recruitment raise some ethical considerations. For example, some participants were familiar with the facilitator and may have perceived her invitation as carrying implicit pressure to participate. While every effort was made to emphasise the voluntary nature of the study, it is difficult to fully rule out the potential influence of peer dynamics on decision-making. The researcher observed no indications that participants felt coerced or hesitant, and no one declined participation after being invited. However, recognising these dynamics is important in reflecting critically on power relationships in inclusive research. Various strategies were employed to address ethical concerns (see Table 3-5).

Table 3-5: Ethical implications and strategies for working with vulnerable adults

Ethical issues	Strategy	Implications of the strategy enacted
The researcher needs to maintain ongoing consent	Employing a disabled facilitator who regularly reassured participants regarding privacy and security, emphasising that their consent could be withdrawn at any time	Empowered participants with control over their involvement, fostering trust and autonomy
The researcher should avoid becoming intrusive	Employing a disabled facilitator	Helped to mitigate power imbalances, allowing participants to feel comfortable and supported throughout the process

Table 3-5 (continued)

Ethical issues	Strategy	Implications of the strategy enacted
The researcher must prioritise participants' well-being and satisfaction during interviews	Participant well-being was continuously monitored, providing ongoing reassurance to ensure a safe and inclusive experience for participants	Safeguarded participants' emotional and physical well-being, resulting in richer and more authentic data
Participants should have access to published data/results in an accessible format	The research findings will be disseminated at one of the organisation's meetings, with results presented in an accessible format for participants	Ensured transparency and participant recognition, enhancing the impact and inclusivity of the research
The researcher should maintain accuracy in responses when a carer is present	Carers participated only in stages 3 and 4, and it was clarified at the outset that the focus remained on the participants' perspective	Minimised the risk of carers influencing responses, maintaining the integrity of the participants' perspectives

These ethical strategies exemplify the study's commitment to inclusivity, participant-centred design, and respect for the participants' rights and well-being. By implementing these strategies, the research aimed to foster an ethical and empowering research environment, ensuring that all participants felt valued and secure in their contributions.

Anonymity

All names used throughout the thesis are pseudonyms. Pseudonyms were employed when quoting participants directly in the study to ensure participant confidentiality and protect their identities. If a participant participated in multiple stages of data collection, the same pseudonym was retained across all stages. Moreover, no identifiable personal information was gathered, and participants provided informed consent for the use of anonymised quotes in the research output. As for the organisation name, initially the organisation wished to be identified as it had been identified before in other research pieces. However, it was mutually agreed that they remain anonymous in their research to protect the members' identities.

Conclusion

This chapter provided a comprehensive overview of the methodological framework employed in this research, combining PAR as the overarching research design with ethnography to ensure the active involvement of people with a learning disability throughout the research process. The chapter commenced by exploring collaborative research approaches, emphasising the unique challenges and opportunities presented

by co-designing with people with a learning disability. Building on this foundation, the chapter introduced a detailed breakdown of the research methodology, outlining the rationale for each method and its contributions to the study's objectives. Following that, the research design was outlined, explaining how the iterative and reflexive nature of PAR and ethnography informed the study. The chapter also introduced the research analysis method, detailing the various phases of thematic reflexive analysis and how it ensured that participants' experiences and the researcher's reflections and positionality were represented in the study's findings. Lastly, the chapter concluded with preparations for fieldwork, including engagement with the community through volunteering, collaboration, and employment. Ethical considerations were addressed, outlining strategies to navigate the complexities of working with vulnerable adults. This chapter laid the groundwork for the subsequent chapters, which will discuss the research stages in detail.

PRACTICE NOTE 1: EMPLOYMENT REFLECTIONS

In this practice note, I reflect on my personal experiences working as a Personal Assistant (PA) at a self-advocacy organisation for people with a learning disability. This experience significantly contributed to my research. By engaging bi-weekly with the learning disability community, I gained invaluable insights into their daily challenges. These observations directly informed my understanding of the barriers they face in navigating the built environment. Through this practice note, I offer insights into how flexibility, empathy, and support systems can be implemented better to accommodate the needs of people with a learning disability.

The Role of a Workplace Personal Assistant

The self-advocacy organisation is run by and for people with a learning disability in Cardiff. They advocate for rights and campaign to change attitudes, improve services, and create more opportunities. They fight for equality, understanding, respect, and acceptance. They are part of a larger national and international network dedicated to self-advocacy. Therefore, it was an excellent collaboration for the research.

After I had formally established the collaboration with the organisation, they had a job vacancy for a PA to support Hamida, the employed research facilitator. So, I was working for her, and she was working for me, which fostered a good friendship, and enhanced power dynamics. The British government grants this job through Access to Work to support disabled people in their roles in the needed capacity (United Kingdom Government [no date][a]; United Kingdom Government [no date][b]). Each person can outline their "reasonable needs" when applying for the grant.

The organisation calls this job "Shine without Shining" to highlight that the main PA role is to support the officers to shine but not to shine themselves. The organisation usually has a dedicated PA for each officer in addition to a pool of reserved PAs to cover on an ad-hoc basis. My primary role was Hamida's PA, but since I worked for the organisation for three years, I supported almost every officer on different occasions.

The following quote is Hamida's reflections on my role as her workplace PA:

> *"At [organisation name], our front-line staff have a learning disability, and I am one of the front-line staff. My PA is Menna, who helps me out with proofreading my emails, timekeeping and organising my schedules between Cardiff and [another job location], helping me navigate my way to meetings and clarifying details I don't understand. Menna has been supporting me for three years, and over that time, she has helped me improve my cultural and professional awareness, giving me the confidence I need to do my job better."*

This unique position allowed me to observe the learning disability community without being intrusive. It allowed me to learn more about the everyday lives of people with a learning disability, what they do daily, and what barriers they face. The insights I gained from this position would be challenging to learn about through traditional research methods.

The job description required acting as a workplace PA for the project officers and working as directed. This means that the job is different depending on the officer's needs. This aligns with the literature that the need for support by people with a learning disability varies widely, but is essential for enabling independence (Mathers 2008; McClimens et al. 2014). However, there were some generic roles, which are summarised below as adopted from the job description.

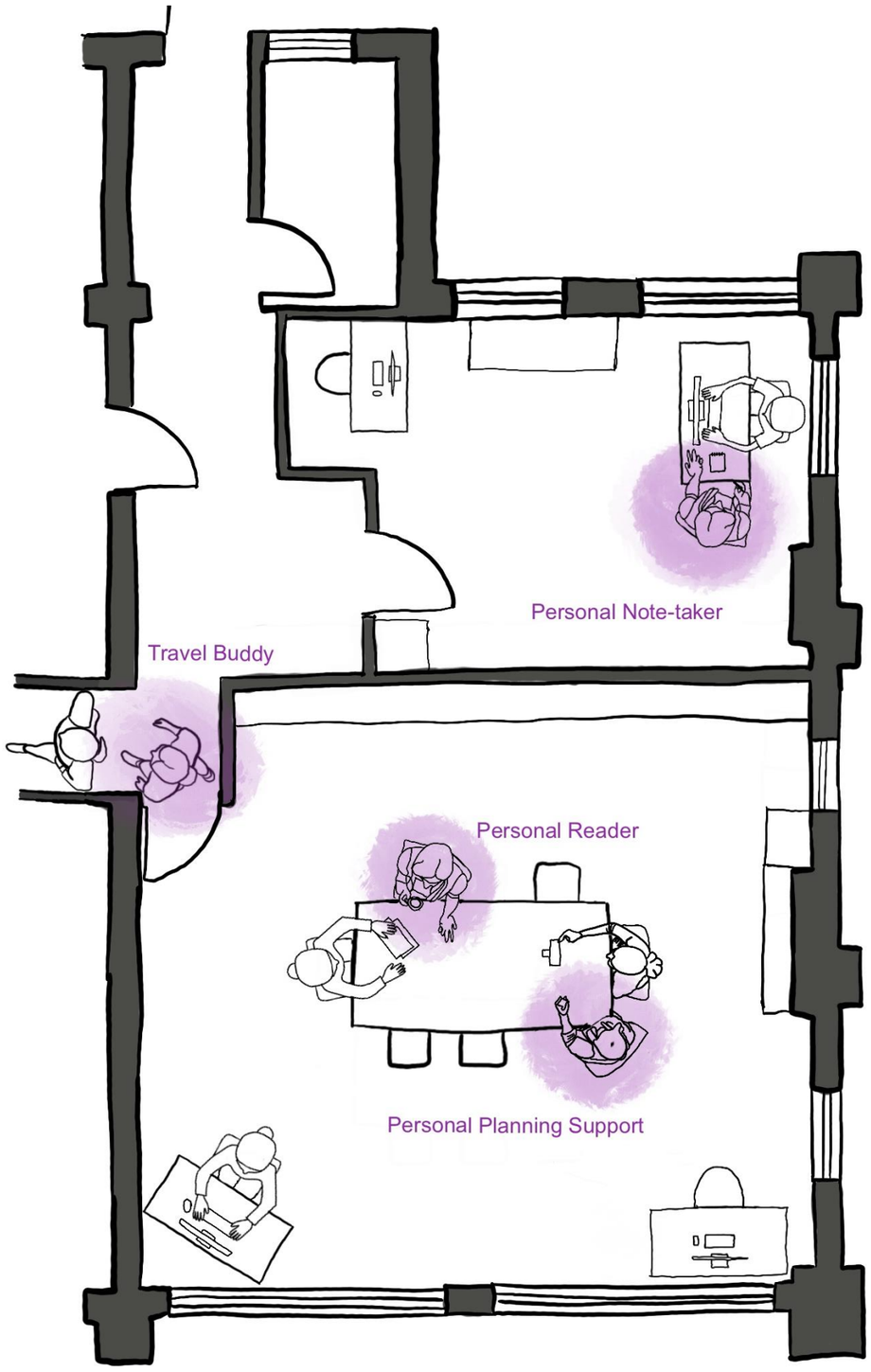
The first role was a **Personal Note-taker**; this role varied greatly depending on the officers' needs. Some will not need it at all, while others will require it. On one end of the spectrum, it involved taking notes in various meetings, events, and venues, and typing emails. Both tasks required careful attention to detail, as I needed to write down only what the officer needed to remember. When writing emails, I need to keep my voice entirely out of it; usually, the officers dictate the entire email. On the other end of the spectrum, I may be sitting entirely outside the meeting room as the officer does not require my support.

Another part of the role was serving as a **Travel Buddy**, where I accompanied officers to various local and national venues, including some that required overnight stays. This involved coordinating travel and booking arrangements, as well as planning and ensuring the officers had everything they needed. Through this role, I attended numerous events and committees related to learning disability, which kept me informed about the latest issues in the learning disability community. One of my primary reflections from this role was the importance of staff and familiarity. Some officers may feel stressed in unfamiliar environments, especially large transportation hubs or new buildings; however, with the proper support, they can excel.

Another role was as a **Personal Reader**, where I read emails, documents, and contracts, among other materials. This role varied widely among the officers, depending on their needs. Hence, it made me realise the importance of flexibility and accommodating diverse requirements. It also made me realise the importance of “simple language”, the other end of the spectrum from my main job “, research language”, which is known to be complicated. This made me develop a sense of awareness of my writing and speaking language. I find myself occasionally deleting unnecessary words and simplifying my writing. It also opened my eyes to the complexity of our literate world.

The last part of the role was providing **Personal Planning Support**. It included helping the officers plan their time and keep their calendars. This is a typical part of any PA job and involves serving as a personal note-taker and reader. As a PA, I needed to keep notes of all upcoming meetings and events and ensure they did not clash. Additionally, I would review the calendar with the officer every week. I also planned all the required actions needed before the event. This may include booking venues and/or tickets, inviting people, coordinating transportation, and preparing materials. Material preparation can vary widely; for example, if the organisation has a stall at a venue, this could include preparing the materials that will be displayed on the stall. If an officer is going to give a talk, this can involve preparing and practising the speech. Additionally, all these different roles needed a level of technical support. Such as managing online meetings, applying for Access to Work, and navigating online dairies.

Looking at these roles, it can clearly be seen that the work venue is not fixed. There is an office where the officers spend almost half of their working time. However, the other half of their jobs, and consequently, my job, would include attending events and meetings, which may involve travelling. The office includes two rooms and a kitchenette. The large room is where we spend most of our time, usually gathered around a large table, each officer accompanied by their PA. We use the small room when someone has a meeting or needs a quiet space. We also occasionally worked from home.



Carrying out various PA roles in the organisation's office.

The Lives of People with a Learning Disability

Through my role, I gained valuable insights into the everyday lives of people with a learning disability. I realised that accessibility extends beyond physical spaces and encompasses how information is conveyed and how interactions are structured. When people approach the organisation, whether representing themselves, research bodies, or other organisations, there is often a lack of understanding about what is accessible and what is not. Many individuals approach the organisation with the intention of "ticking a box" for compliance or inclusion, while others arrive with a genuine desire to learn and engage. I was also one of those individuals. When I first approached the organisation, I was asked to meet the officers and members online to discuss my research. I prepared a slideshow presentation, which, I now realise, was inaccessible. The officers usually advise guests not to prepare formal presentations, instead suggesting more informal, conversational interactions with the members.

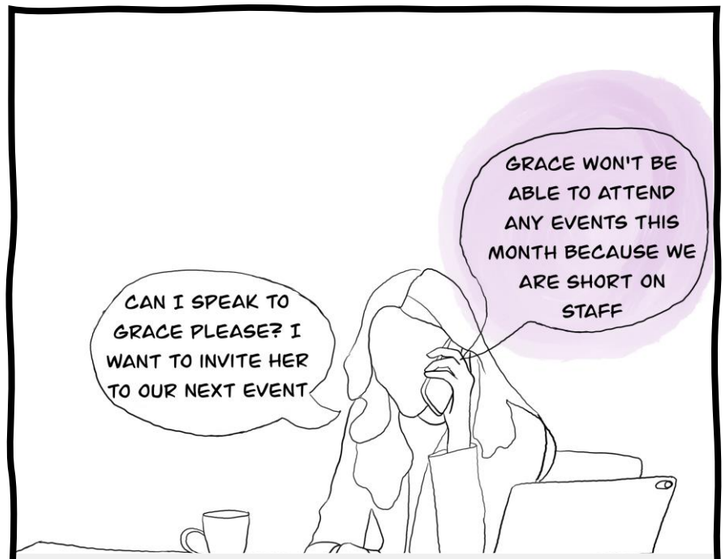
I made several other observations that influenced my interpretation of the data collected during the research activities. For example, I observed that many members adhered to a daily routine that provided security and structure. Disruptions of these routines led to anxiety or frustration. Understanding these dynamics helped me approach the data with empathy, ensuring participants' active engagement. These insights shaped my understanding of barriers faced by people with a learning disability and influenced my research design, making me more mindful of participants' diverse needs and preferences.



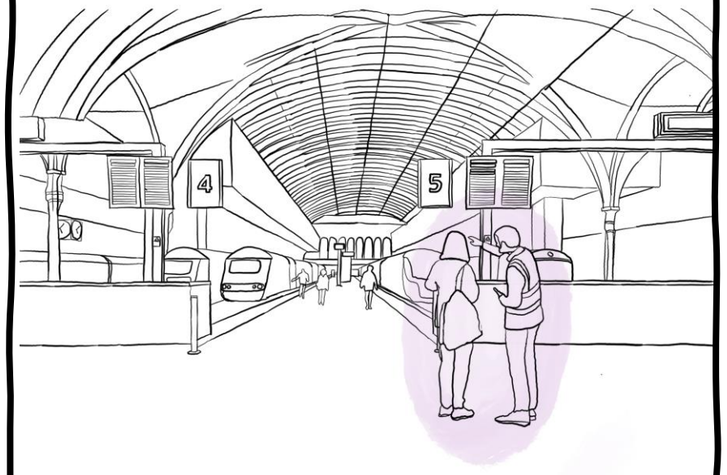
Some members had busy lives, between work (mostly voluntary, though) and social life, just like any of us. However, many do not have much to do and feel lonely. This sometimes caused issues with the officers, as these members may try to contact them outside working hours as they feel lonely and wish to discuss their personal lives



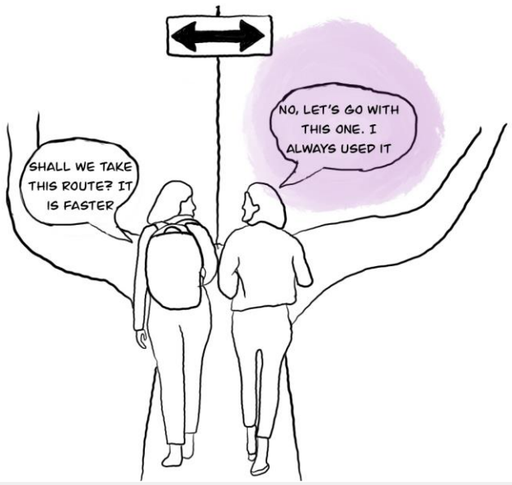
Most people with a learning disability have a routine that they rarely break. As a result, experienced officers know each member's routines by heart. They know exactly when and how to contact them. They also know who is interested in specific activities and who is not. This was invaluable during recruitment



Members' independence varied by where they lived. Over half lived in supported housing or with families and, hence, may have less control over their schedules. A persistent issue was support staff shortage; members may miss events because they cannot go out without support staff. Furthermore, contacting those in supported housing often required going through staff first.



Regarding accessibility, I observed that anxiety about unfamiliar places can be eased with company, either friends, family members, or support staff. I also notice that well trained floor staff can be a great help in supporting people with learning disability, specially in busy places. Hence, the organisation always advocates disability awareness training, which they offer to different parties



I also noted that people with learning disability have a specific way of doing things , their own way. That can include everything, from getting lunch from a specific place to taking specific routes when navigating familiar buildings. Consequently, any change in that routine may cause stress



Flexibility was critical in work accommodations and physical accessibility due to varied individual needs. Some adapt easily to last minute changes, while others find it frustrating. Additionally, extended time is important, hence, communication and interactions were not rushed. Officers planned activities carefully and of often declined last minute invitations

Conclusion

This experience deepened my understanding of the lives, challenges, and unique needs within the learning disability community. It underscored the need for flexibility, tailored support, and awareness of barriers. The role of PA made me recognise the significance of compassion, patience, empathy, and advocacy in promoting inclusivity. Initially, I entered the position with limited experience working directly with people with a learning disability. Still, over time, I acquired a deeper understanding of the nuances of inclusion and support in both professional and social contexts. Interacting with officers and members helped me develop a more empathetic and flexible approach, adapting my communication, organisational, and problem-solving skills to meet diverse needs. This experience also shaped my academic approach, providing insights into the barriers faced by people with a learning disability in the built environment and daily lives, which informed my research. The firsthand observations of accessibility challenges, the importance of routine, and the need for personalised support were central to my approach to engaging people with a learning disability in my research. These practical insights enabled me to challenge traditional notions of accessibility and advocate for designs that accommodate and empower people with a learning disability.

4. SCOPING

This chapter marks the outset of the fieldwork, reviewing the first research stage, Scoping, which includes conducting interviews with people with a learning disability to select a case study.

Introduction

The previous chapter outlined the research methodology and introduced the various research stages, concluding with a discussion of fieldwork preparation. This chapter discusses the first stage of the fieldwork, Scoping. During this stage, semi-structured interviews were conducted with people with a learning disability to explore how they use different buildings across Cardiff.

As discussed in Chapter 3, each fieldwork chapter followed a specific structure that includes four sections: preparation, data collection, analysis and findings (see Figure 4-1). Preparation included a review of the literature on best practices for conducting interviews with people with a learning disability. Then, the interview structure was designed, and then the ethical application was acquired. The preparation concluded with consultations to ensure the accessibility of the interview process. The second section involved conducting the interviews. The analysis was then conducted using reflexive thematic analysis. Finally, the findings were presented and validated through further consultations, ensuring the credibility of the results.

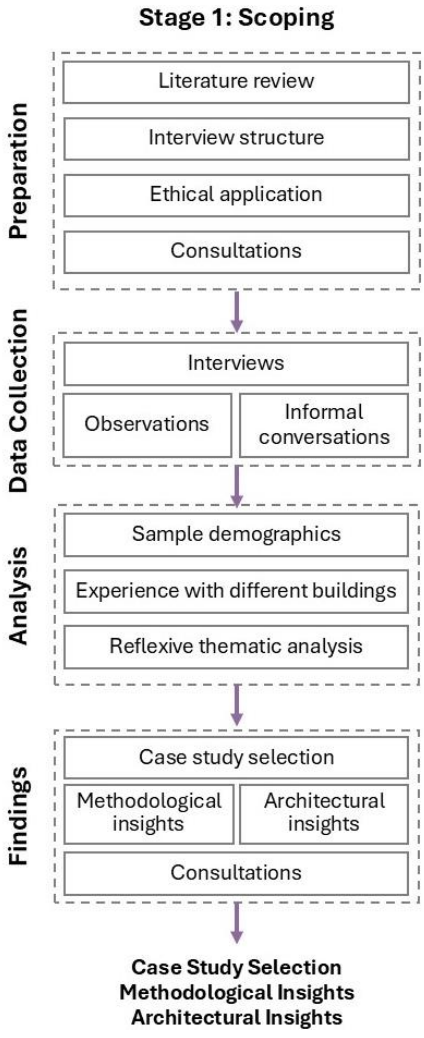


Figure 4-1: The chapter structure encompassing four sections

Preparation

The preparation began with a review of the literature to identify best practices for conducting interviews with people with a learning disability. After reviewing the literature, the interview questions, implementation techniques, and participant-facing documents were developed. The facilitator then reviewed these materials to ensure that the interview process was inclusive and accessible. The final section of the preparation included the ethical application process undertaken prior to commencing data collection.

Interviewing people with a learning disability

Since people with a learning disability are considered vulnerable, special approaches and techniques are required when engaging them in research (Walmsley 2004). These approaches are essential to enable participants with a learning disability to generate information and share knowledge on their own terms (Kindon et al. 2007). Researchers and organisations have recommended various techniques to ensure the accessibility of interviews for people with a learning disability.

Before starting the interviews, it is recommended to get acquainted with the participants, as it supports the researcher's understanding of communication methods and participants' routine (Hollomotz 2018). The context of the interview is also a vital factor, as it is important to conduct the interviews in a quiet, distraction-free environment (Mencap 2016).

Regarding the interview mode, a report by Mencap, a leading UK charity that supports people with a learning disability, included a poignant quote: "The best way for somebody to communicate with me is face-to-face, because you never know how the other person is feeling" (Mencap 2016). This highlights the importance of face-to-face interactions. Additionally, face-to-face interviews can help foster various modes of communication, such as symbols, language, or art forms, and the use of photos, pictures, or drawings to enhance understanding, which is recommended by previous research (Fudge Schormans et al., 2019; Kindon et al., 2007).

During the interviews, it is crucial to follow the participant's lead if they wish to show something and avoid rushing communication (Gary et al. 2012; Mencap 2016; Fudge Schormans et al. 2019). Another key recommendation is to be mindful of individual differences. Researchers are advised to follow the pace of the participant, check understanding by paraphrasing, and remain observant of non-verbal cues such as body language and facial expressions (Mencap 2016).

People with a learning disability may not be able to concentrate for lengthy periods. Hence, it is recommended to keep the interview short, segment it into parts and stop the interview if the participant feels tired of talking (Hollomotz 2018). Furthermore, considerations should be given to other disabilities that may

impede communication; hence, special accommodations, such as using larger text or avoiding overly bright colours in written materials, are necessary (Mencap 2016).

Language is another key feature of the interview process. Simplifying research materials, such as information sheets, and reading out the information to participants can further ensure accessibility (Inglis and Cook 2011). Consequently, the language of the research materials should remain simple, avoiding jargon or long words to ensure clarity (Mencap 2016).

Effective questioning techniques are essential. Open-ended questions should be employed to encourage conversation, and researchers should be observant, learning from experience and seeking input from caregivers when necessary (Mencap 2016). Lastly, mirroring activities, such as taking journeys to familiar places and engaging in conversations about everyday experiences, have been recognised as effective methods to foster dialogue and involve participants (Fudge Schormans et al. 2019).

All these recommendations were considered when developing the interview structure for this research, which will be detailed and reflected upon throughout the various sections of the Scoping stage.

Interview structure

This research stage aimed to answer the following questions:

- What buildings do people with a learning disability frequently visit in Cardiff?
- What buildings are preferred by people with a learning disability in Cardiff?
- What buildings are avoided by people with a learning disability in Cardiff?

These questions aimed to understand how people with learning disability use different buildings in Cardiff, to select a case study. They were explored through semi-structured interviews, supplemented by observations and informal conversations with participants during employment. This approach aligns with the recommendation of Atkinson, who suggested combining interviews with participant observation to obtain richer data (Atkinson 2007).

Interview questions design

The interviews were kept concise and straightforward, adhering to the recommendations above. They were divided into two parts:

1. **Personal and Eligibility Questions**
   The first part of the interview consisted of personal and eligibility questions, including three mandatory and two optional questions. These questions were designed to collect fundamental demographic

information while ensuring that participants met the study's eligibility criteria. Mandatory questions are marked with an asterisk (*).

1. How old are you? *
2. How would you describe your gender?
3. Do you have a learning disability? *
4. What is your learning disability?
5. Do you live in Cardiff? * If no, do you visit Cardiff?

2. Experience with Buildings

The second part of the interview focused on participants' experiences with different buildings in Cardiff. This section consisted of seven questions, of which six were open-ended, allowing participants to share more detailed information about their interactions with the various buildings around Cardiff.

1. Do you study, work, both, or neither?
2. What building(s) are you based in during daytime hours?
3. What other building(s) do you visit on a day-to-day basis?
4. What other building(s) do you visit on weekends or holidays?
5. Do you have a favourite public building(s) that make you feel at ease? If yes, which buildings are they?
6. Do you avoid certain buildings because you don't feel comfortable in them? If yes, which buildings?
7. Are there any further comments you would like to add?

Given that the interview questions focused on a range of buildings across Cardiff, it was not feasible to accompany each participant to all these locations. As a result, participants may struggle to recall their experiences or recognise buildings from the interview questions alone. To help participants remember their experience with buildings, cue cards displaying images of different building types across Cardiff were utilised, inspired by the aforementioned recommendations (see Figure 4-2). These cue cards served as prompts and memory aids for participants who either did not recall their experiences or were uncertain about how to respond.



Figure 4-2: A sample of the cue cards used during the semi-structured interviews.

Participants facing material

Following the recommendations from the literature, the participant-facing materials, including the recruitment flyer, participant information sheet and consent form, underwent multiple iterations to ensure accessibility (see Appendix 1, p. 260).

First, a lecturer in Education Development at the Cardiff Learning and Teaching Academy, with experience working with people with a learning disability, reviewed the participant-facing materials. They provided valuable feedback regarding the language used and the colours of the flyer, offering suggestions to enhance accessibility. Additionally, they recommended increasing the variety of interview modes to reach a broader audience. As a result, documents were prepared to support five different interview modes, allowing participants to choose the mode that best suited their needs and preferences. Notably, the verbal interview, whether conducted online or in person, may take more time:

1. Easy-Read Document
2. Screen Reader Document
3. Online Survey
4. Verbal Interview online
5. Verbal interview in-person

Second, to address the language concerns, Easy-Read documents from Learning Disability Wales were used as a reference to ensure that the materials were as accessible as possible. Additionally, the flyer's colours were enhanced for better legibility.

Finally, various guidelines for creating accessible documents, especially Easy-Read, were applied to enhance the comprehensibility and inclusivity of the participant-facing document. These guidelines included:

1. ‘Accessible Communication Formats’ by the Cabinet Office and Disability Unit- UK Government (Cabinet Office and Disability Unit 2021).

2. ‘Make it easy’ by the National Health Service (NHS) (National Health Service England 2018)
3. ‘Dos and don'ts on designing for accessibility’ by the Home Office- UK Government (Pun 2016)

It is worth noting that some of these guidelines are not specifically directed towards people with a learning disability. However, the research aimed to ensure accessibility for participants with other impairments, not just learning disability. It is also worth noting that some guidelines were specific to web design; these were applied to the online versions of the interview. However, the recommendations on language and colour were also applied to the other versions. The recommendations from these guidelines can be categorised into four categories: general considerations, layout, format and language (see Table 4-1).

Table 4-1: Accessibility and Easy-Read guidelines by different organisations (N/A: Not-Applicable, P/A: Partially Achieved)

Requirement	Flyer	Questions	Consent	PIS	Reference
General					
Keep the number of pages to 24 or less	√	√	√	√	(Cabinet Office and Disability Unit 2021)
Include a glossary explaining abbreviations and jargon, and an index at the end of the document	N/A	√	√	√	
Consider producing materials in other formats (for example, audio or video)	√	√	√	√	(Pun 2016)
Layout					
Follow a linear, logical layout	√	√	√	√	(Pun 2016)
Design for keyboard or speech only use	√	√	√	√	
Format					
Use a 14-point font size and	√	√	√	√	(Pun 2016; National Health Service England 2018; Cabinet Office and Disability Unit 2021)
Use pictures to support the meaning of your text	P/A	√	√	√	(Pun 2016; Cabinet Office and Disability Unit 2021)

Table 4-1(continued)

Requirement	Flyer	Questions	Consent	PIS	Reference
Use a different colour or bold type, but keep a good contrast with the paper	√	√	√	√	(Cabinet Office and Disability Unit 2021)
Align text to the left and keep a consistent layout	√	√	√	√	(Pun 2016)
Use simple colours	√	√	√	√	
Use good colour contrasts	√	√	√	√	
Use a combination of colours, shapes, and texts	√	√	√	√	
Language					
Keep sentences short, clear, and simple	√	√	√	√	(Pun 2016; National Health Service England 2018; Cabinet Office and Disability Unit 2021)
Take out words that are not needed	√	√	√	√	(National Health Service England 2018; Cabinet Office and Disability Unit 2021)
Each sentence should have just one idea and one verb	√	√	P/A	P/A	(Cabinet Office and Disability Unit 2021)
Make sentences active, not passive	√	√	P/A	P/A	
Use full words, not acronyms	√	√	√	√	
If you need to use difficult words or ideas, say what they mean – do this in the following sentence, not as part of the same sentence	N/A	√	√	√	
Write in plain language	√	√	√	√	(Pun 2016)
Get rid of difficult words	√	√	P/A	P/A	(National Health Service England 2018)
Use Bullet points	√	√	√	√	(Pun 2016; National Health Service England 2018)

Ethical application

Given that this research involved collaboration with vulnerable participants, it was subject to review by the Welsh School of Architecture Research Ethics Committee (SREC) at Cardiff University to ensure that all ethical standards were met before proceeding with data collection. Upon review, the committee granted

ethical approval for the research, with SREC reference: 2204 (see Appendix 2, p. 287).

Consultations

After obtaining ethical approval, the researcher held several consultations with the facilitator and the organisation to assess the accessibility of the interview process. The meetings focused on ensuring that the research process and materials were inclusive and accessible to the participants. The facilitator reviewed the participant-facing materials and the structure and techniques of the interviews, providing invaluable suggestions to improve accessibility. One key recommendation from the consultations was to conduct all interviews in person, which aligns with the literature mentioned earlier.

As this was the researcher's first interaction with the learning disability community, the consultations recommended that the researcher attend the organisation's meetings and events to verbally introduce the research, replacing the recruitment flyer, and help build rapport with the community, thereby fostering trust. Verbal introductions offer an opportunity for the researcher to personally engage with potential participants, which can encourage participation. Furthermore, this approach would help address potential illiteracy by allowing for direct verbal communication, ensuring that participants can make an informed decision about their involvement in the research.

While the participant information sheet had already been provided in an Easy-Read format, the consultations recommended converting it into a video format to support participants who might struggle with reading. The facilitator and researcher implemented this suggestion before conducting the interviews. The video format allowed participants to engage with the information in a more accessible manner, particularly those with limited literacy.

Lastly, the facilitator proposed that all participants receive a participation certificate as a token of appreciation for their time and contributions to the research. The certificates were designed by the researcher, approved by the facilitator, and signed by both the researcher and the principal supervisor (see Appendix 3, p. 290). This gesture aimed to acknowledge participants' involvement and express gratitude for their contributions.

Data Collection

As agreed during the consultations, the researcher was invited to various events and meetings hosted by the organisation at multiple venues where potential participants were present. After each event or meeting, the facilitator approached potential participants, introduced the researcher, explained the purpose of the research, and invited those interested to watch the participant information video. If participants expressed a willingness to proceed, the

facilitator then verbally administered the consent process and requested signatures on the consent form. Following this, participants received an Easy-Read version of the participant information sheet and consent form for their records, along with a participation certificate.

To maintain data security and integrity, interviews were recorded on a password-protected mobile device. Immediately after each session, the audio files were uploaded to the university's secure cloud storage. Once the successful transfer was confirmed, the originals were securely deleted from the phone to eliminate any residual risk. In addition to audio recording, the interviews were also documented through note-taking to capture non-verbal cues.

In cases where participants had difficulty recalling specific buildings, understanding questions, or formulating responses to the second set of questions, cue cards were introduced as a prompt (see Figure 4-2). The cue cards featured images of various buildings around Cardiff. Participants were asked to sort the cue cards into three categories: "I am okay with/I like this building," "I don't like this building," and "I am not sure about this building/never been to." The researcher facilitated this process by labelling these categories on sticky notes (see Figure 4-3). The results of this activity were documented through photography.

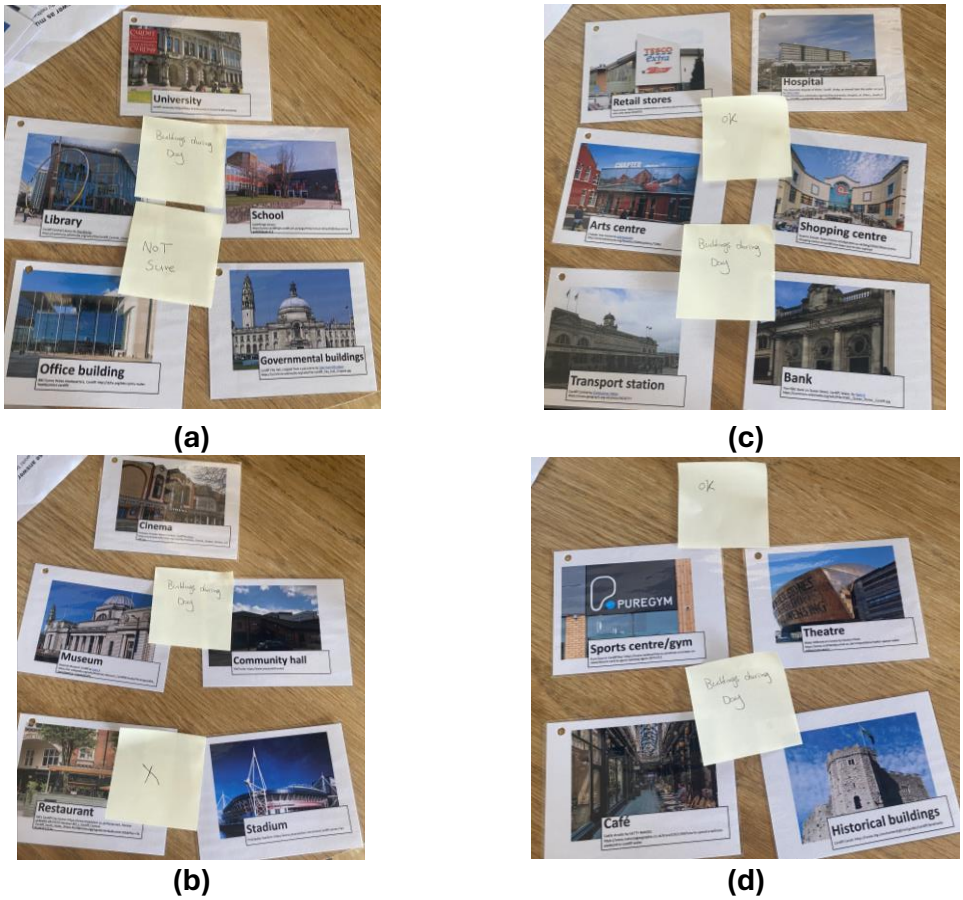


Figure 4-3: A sample of the sorting activity. (a) buildings the participant was not sure about; (b) buildings the participant did not like; (c,d) buildings the participant liked

As this was one of the researcher's first interactions with the learning disability community, the facilitator often posed the interview questions. This arrangement allowed the researcher to concentrate more on observations while ensuring the interview process was conducted properly. This approach created a more relaxed and familiar atmosphere for participants, as they were approached by a friend rather than an outsider, which helped build rapport and made them feel at ease during the interviews.

Given that convenience sampling was employed, the sample size was determined by data saturation. The reflexive thematic analysis was conducted concurrently with the interviews to identify emerging themes. Saturation was reached by the sixth interview, and by the tenth interview, no new themes emerged. Thus, a total of ten interviews were conducted, as this was deemed sufficient to capture a comprehensive range of perspectives and achieve data saturation at this stage. Additionally, ten interviews were within the recommended range by Braun and Clarke for a study in a large project, as previously mentioned in the preceding Methodology chapter (Braun and Clarke 2013).

Informal conversations and observations through employment

The informal conversations and observations took place at various times, before, during, and after the interviews, providing ongoing opportunities for the researcher to engage with participants and reflect on their responses during the interviews. As mentioned earlier, the researcher attended several events and meetings with the organisation, which facilitated informal conversations with participants. This engagement was further enriched by the researcher’s dual role as both an insider, due to her employment with the organisation, and an outsider, as a newcomer to the community.

Data capture was deliberately flexible, following the range of activities in which the researcher was engaged (see Practice Note 1). Notes were made on the go in a personal paper diary or via a secure notes app on a password-protected phone, and photographs documented environmental features. Rather than maintaining a separate field book, these raw notes were subsequently integrated with formal interview transcripts.

These observations were integral in documenting the lived experiences of the community, providing a deeper understanding of their needs beyond the formal interview responses. These interactions were invaluable in enriching the researcher’s understanding of the community’s accessibility needs. The insights gathered from these interactions helped inform key decisions throughout the study, ensuring that the research remained relevant and responsive to the participants' needs. Furthermore, these interactions offered important context for the interview notes, which will be explored in more detail in the following Analysis section.

Analysis

The analysis of this stage followed the reflexive thematic analysis approach. After transcribing the interviews, the insights from informal conversations, observations, notes, and photos were sorted and categorised. Additionally, demographics and participants' experience with different buildings were analysed before delving into the different phases of the reflexive thematic analysis.

Sample demographics

Demographic data were analysed using simple descriptive statistics, primarily through frequency counts. The sample comprised 10 participants, aged between 30 and 64 years; of these participants, eight identified as female and two as male. Nine participants lived in Cardiff, while only one frequently visited the city for work purposes. Only three participants were employed at the time, and several reported having additional conditions alongside their learning disability, including ADHD, autism, dyspraxia, and dyslexia. This demographic diversity provided a broad spectrum of experiences, likely influencing participants' perceptions and interactions with the buildings being investigated.

Experience with different buildings

The participants' comments on various building types were recorded across three categories: positive, negative, or neutral, to support case study selection (see Table 4-2):

1. **Positive comments**
   - Commercial/retail buildings: 7 out of 10 participants provided positive comments about shopping centres and retail stores.
   - Hospitality buildings: 7 out of 10 participants expressed positive views about coffee shops, while 6 out of 10 had positive views about restaurants.
   - Cultural buildings: 6 out of 10 participants had positive views about historical buildings, while 5 out of 10 provided positive feedback on theatres and museums.
   - Sports buildings: 5 out of 10 participants had positive opinions about stadiums.
2. **Negative comments**
   - Civic buildings: 6 out of 10 participants reported negative experiences with community halls/hubs.
   - Educational buildings: 5 out of 10 participants had negative views about schools, libraries, and universities.

Table 4-2: Participants' feedback on different buildings, categories with five votes/comments or more are highlighted

Building category	Building type	Votes/comments		
		Positive	Negative	Neutral
Commercial and retail	Shopping centres	7	0	3
	Retails stores	7	0	3
Hospitality	Coffee shops	7	0	3
	Restaurants	6	1	1
	Pubs	1	1	0
Cultural and heritage	Arts Centre	4	2	0
	Historical buildings	6	2	3
	Theatre	5	2	0
	Museum	5	3	1
Civic and transport	Community hall	1	6	2
	Transportation station	3	4	0
	Governmental building	3	3	2
Sports and leisure	Stadium	5	2	0
	Gym	4	3	1
Educational	School	1	5	0
	University	0	5	0
	Library	2	5	0
Administrative	Office buildings	4	3	3
	Bank	3	3	0
Entertainment	Cinema	4	2	0
	Bingo Hall	1	0	2
Healthcare	Hospitals	4	3	0
	General Practice Clinic	1	0	1
Religious	Church	0	0	1
Personal services	Beauty salon	0	0	1

Note: During interviews, participants were shown photographs of individual buildings without any categorical grouping. Categories above were applied post hoc for analysis.
Vote totals per row may not equal 10, as some participants mentioned buildings not shown on the cards, while others did not comment on every card.

Reflexive thematic analysis

In the reflexive thematic analysis, the researcher's positionality significantly shapes both the data collection process and the interpretation of findings. In this study, the researcher continuously considered the impact of her positionality throughout. This analysis unfolded across six phases, as mentioned earlier in the Methodology chapter, Data Analysis section. Each phase facilitated critical engagement with the data and iterative development of key themes while

reflecting on how the researcher's insider/outsider status influenced the research process.

During familiarisation, the researcher immersed herself in the dataset by reading, re-reading, and noting initial impressions. This highlighted early patterns, like the importance of familiarity in perceiving accessibility. Participants often mentioned shops, cafés, and restaurants central to their routines. These spaces were strong case study candidates because they were familiar and frequently visited. The researcher also noted that participants felt more comfortable in environments they regularly encountered, strengthening the link between familiarity and accessibility.

During code generation, key data segments were identified and created labels such as "accessibility equals familiarity" and "complexity leads to inaccessibility." Familiarity evolved in tandem with other architectural insights, including layout, signage, and entrances.

As candidate themes developed, codes were organised into three categories aligned with research questions and stage aims: case study, methodological framework, and architectural insights. The "Case Study" category emerged from analysing participants' preferences for everyday spaces, coffee shops and retail spaces were perceived as more desirable. Conversely, educational and healthcare buildings received negative feedback due to their complex layouts and poor social experiences, which affected perceptions of accessibility.

The "Methodological Insights" category discussed the accessibility of the research process. Collaboration with the organisation and facilitator was crucial, ensuring a smooth recruitment and an inclusive environment for the participants. The researcher's initial use of Easy-Read materials, as suggested in the literature, was less effective. Participants preferred verbal communication, leading the researcher to depend more on face-to-face interactions, cue cards, and spoken explanations. This methodological adjustment was pivotal in making the research process more accessible.

The "Architectural Insights" category reflected participants' comments on accessibility features and the researcher's observations. While this stage did not aim to identify architectural barriers, participants shared thoughts on the physical environment. For example, familiarity with buildings like the organisation's office led to positive feedback; conversely, participants found large, complex spaces, such as libraries, to be inaccessible. The researcher also noted that clear signage and well-designed entrances increased participants' confidence and ease of navigation. The social experience within specific buildings, such as negative past experiences in schools, also affected perceptions of accessibility.

In the final analysis phase, themes were integrated into a cohesive narrative that encompassed both the research questions and the broader literature, organised

into three main sections: Case Study Selection, methodological insights, and architectural insights. These insights deepen the understanding of accessibility in terms of physical space and the research process itself while also providing practical recommendations for subsequent research stages.

Findings

The section reviews the findings, including case study selection, methodological and architectural insights and contextualises them with the existing literature. Finally, the section concludes with consultations with the facilitator to verify the findings.

Case study selection

Selecting a building as a case study was the main aim of this stage. The analysis revealed that the best two candidates were shops and coffee shops/restaurants for two reasons. First, they received the most positive feedback among different building types, making them familiar environments for most participants (see Table 4-2). Second, participants frequently mentioned them as part of their daily routine, which was evident in their answers to the question, "What other building(s) do you visit on a day-to-day basis?":

- "*I go to the shops, I go to the coffee shops, and I go to the village have a coffee, I go to all the charity shops, I go to the doctor' for check-ups.*" Michael
- *"The castle, castle bingo, courts we just did, coffee shops, Markets, [restaurant name]"* Daisy
- *"I visit local shops"* Mia

Methodological insights

Several insights regarding the accessibility of the research process itself emerged. They will later be incorporated into the methodological framework for conducting architectural research with people with a learning disability. The insights are presented to follow a logical progression. Accordingly, this section first discusses collaboration, then verbal admission, followed by prompts, and concludes with the implications of extended time and budget.

Collaboration

The collaboration with the organisation and the facilitator proved invaluable in ensuring the research's accessibility and inclusivity, aligning with previous research (Strnadová et al. 2016). For example, participants appreciated receiving the participation certificate, which highlighted the invaluable contributions made by the facilitator.

Besides ensuring the research's inclusivity, this collaboration facilitated a smooth introduction to the community, making the participants feel at ease. It

also guaranteed that the study complied with ethical principles. Furthermore, working with and for the organisation provided critical insights into the daily lives of people with a learning disability.

Verbal admission

Preparing participant-facing documents in Easy-Read format was not the most critical accessibility feature, contrasting with the heavy literature and organisations' recommendations previously mentioned, highlighting its significance (National Health Service England 2018; Mencap 2024). Many participants felt more comfortable speaking than reading, and some rarely engaged with the written materials. This aligns with Inglis and Cook, who highlighted that reading the information enhances accessibility (Inglis and Cook 2011).

It should be noted that transferring the documents into Easy-Read made them quite long (see Appendix 1, p. 260). For example, the original consent form was one page long, while its Easy-Read version was ten pages long. As a result, the participant information sheet was communicated through video and verbal admission.

The multiple interview modes also proved less helpful, as none of the participants used them. Verbal, face-to-face communication, what the facilitator referred to as "word of mouth", proved to be the most effective and accessible method. Highlighting the vitality of the facilitator role and regular consultations. This mode of communication also helped build rapport with the community and facilitated deeper insights beyond the initial expectations of the stage.

Prompts

The use of cue cards emerged as an effective tool for prompting responses, particularly for participants with limited communication skills. They assisted participants in actively engaging with the interview questions, offering a more interactive and accessible experience. This aligns with the recommendations of previous literature (Kindon et al. 2007; Fudge Schormans et al. 2019).

Prompts were also invaluable for the facilitator. Initially, the interview questions were printed on a single sheet of paper for the facilitator's reference. However, during the final interviews, the questions were transcribed onto individual cards, with one question per card. This adjustment enhanced the flow of the interview, making the process more interactive and flexible for the facilitator (see Figure 4-4).

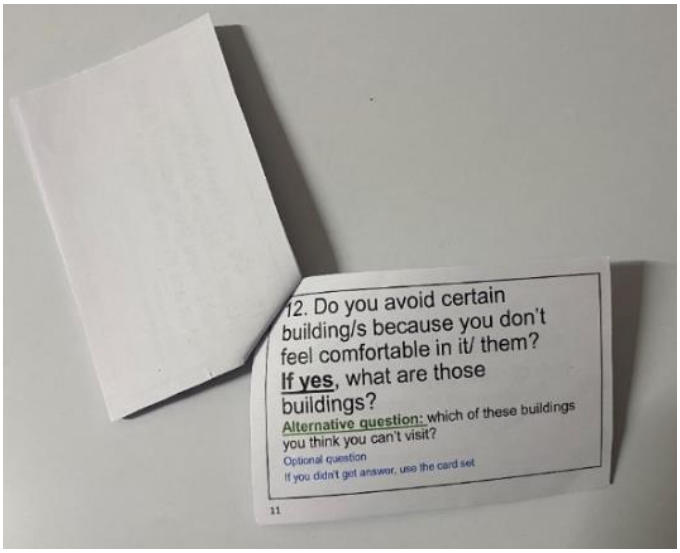


Figure 4-4: Question cards for the facilitator

Extended time and budget

As mentioned earlier, the researcher attended several meetings and events with the organisation to build rapport with participants. At some events, one or two participants were interviewed, while at others, no one was interviewed. This variability, combined with the reliance on verbal consent and personal interaction, resulted in a longer data collection period than initially planned; which was evident in previous research (Gary et al. 2012; Fudge Schormans et al. 2019). While this extended timeline deviated from the original research plan, it proved invaluable in building trust within the community. Face-to-face interaction was essential to collecting rich, authentic data.

Moreover, the collaboration with the self-advocacy organisation required adjustments to both the timeline and budget to accommodate consultation processes and the employment of the facilitator. The facilitator's time was funded through the researcher's bench fees, provided by the doctoral funding body. While this collaboration increased the research's costs and time commitment, it is a common adjustment in inclusive research (Tuffrey-Wijne and Butler 2010; Strnadová et al. 2016). It enhanced accessibility, ethical rigour, and the richness of the data, benefits that far outweigh the additional resources required.

Architectural insights

While the primary aim of this stage was not to collect data specifically on architectural features, the rich data collected, especially during employment, revealed several key features that can affect accessibility for people with a learning disability. These insights are presented, ranging from general perceptions to specific design elements, including familiarity, social experience, building layout, entrances, and signage. These insights will be explored in greater detail during the next stage, Exploring through walking interviews.

Familiarity

One of the most significant themes that emerged from the data was the role of familiarity in shaping perceptions of accessibility. The buildings that received the most positive feedback were commercial/retail buildings and hospitality buildings, which participants were frequent visitors of, particularly those in the city centre, aligning with findings of previous research (McClimens et al. 2014). The high degree of familiarity with these spaces appeared to nurture a sense of comfort and accessibility. For instance, when meeting friends from the learning disability community, it was common for the conversation to include remarks such as, "I'll have a look around the shops" or "I'll grab a coffee," implying that these types of spaces are well-known and familiar.

The familiarity of those specific buildings may also be attributed to the fact that the daily schedules of people with a learning disability do not change frequently and do not involve many new buildings, especially for those who are not employed. This was clear during the interviews and employment. In response to questions about buildings they visit on a day-to-day basis or during weekends, coffee shops, restaurants, and city centre shops have been mentioned frequently. Notably, many of them would mention a specific coffee shop or restaurant that they typically visit.

Similarly, positive comments about cultural buildings can also be attributed to familiarity. It was noted that the organisation collaborates with some museums in Cardiff, while some cultural buildings are regularly used for meetups. As a result, many participants were already familiar with these spaces. Similarly, positive feedback for stadiums often came from participants who were sports fans or had attended events at these venues, reinforcing that familiarity played a significant role in shaping their positive experiences.

Interestingly, all the participants who worked mentioned their workplaces as their favourite buildings. This again aligns with the theme of familiarity, where participants felt comfortable and confident in spaces they frequently visited. However, familiarity did not always equate to accessibility. For instance, while many participants were familiar with the central library, they still found it challenging to navigate and perceived it as inaccessible.

Social experience

Another critical factor influencing perceptions of accessibility was the social experience within the building, which aligns with the findings of existing literature (Mathers 2008; Sherman and Sherman 2013). Several participants shared negative comments about educational buildings, particularly those related to their experiences with bullying in schools. For example, Mia noted, "I have had a bad experience a little bit in school as well. I give up on people getting on me, but I stand up for myself anyway." This suggests that the social context can impact

how accessible and welcoming environments feel to people with a learning disability.

Similarly, negative feedback on health buildings was often linked to previous negative experiences, indicating that the social atmosphere can impact accessibility. This also reflects the positive experience of cultural buildings; since the organisation had established collaborations with some of the museums, the staff of these museums were perceived as welcoming, thereby enhancing the overall experience of the building.

Building layout

Although participants did not explicitly mention complex building layouts, the feedback they provided suggests that building scale and layout complexity significantly impacted their perceptions of accessibility, which aligns with previous research (Salmi 2007). For example, participants gave negative feedback about the central library, highlighting its complex vertical connections and overwhelming scale (see Figure 4-5). These features likely made the library feel inaccessible and confusing.



Figure 4-5: The library had complex vertical connections, which the participants reported as confusing

In contrast, the organisation's office, located in a small-scale building with a simple layout, received positive feedback probably for its ease of navigation (see Figure 4-6). These observations highlight that smaller buildings with simple layouts are often perceived as more accessible.



Figure 4-6: The organisation's office is located in a small-scale building, making it easier to navigate (the building name and surrounding businesses have been redacted for anonymity)

Entrances

The design of entrances also emerged as a feature affecting accessibility. Participants provided positive feedback for cultural buildings in general, many of which are known for their central, clear entrances (see Figure 4-7). Central entrances make it easier for individuals to navigate and feel confident in their ability to enter the building.

In contrast, unclear entrances may be problematic. For example, Daisy, during a visit to a theatre, expressed frustration with the lack of clarity where multiple doors caused confusion: "I don't know which door to use, and I don't know if I am even allowed in" (see Figure 4-8). This highlights the importance of having a clear central entrance to reduce confusion and improve accessibility.

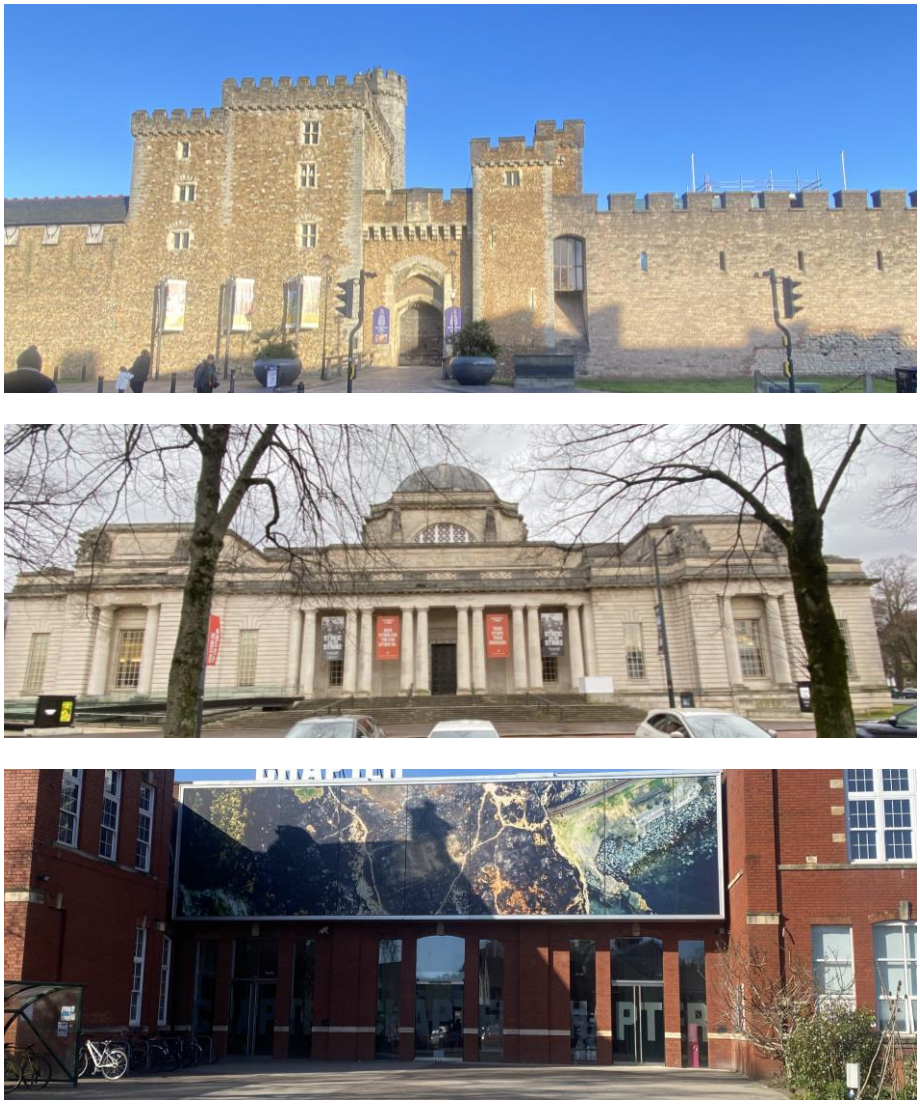


Figure 4-7: Examples of cultural buildings that received positive feedback from the participants in general. A clear central entrance is a common feature between them



Figure 4-8: One of the theatre buildings in Cardiff, where the main façade features at least eight doors

Signage

The importance of clear signs in effective wayfinding was highlighted in the interviews, which aligns with previous research (Salmi 2007; Castell 2012). Participants noted that bilingual signs, which used both English and Welsh without any clear distinction between them, were an inaccessible feature (see Figure 4-9). This issue highlights the importance of clear and consistent signage.

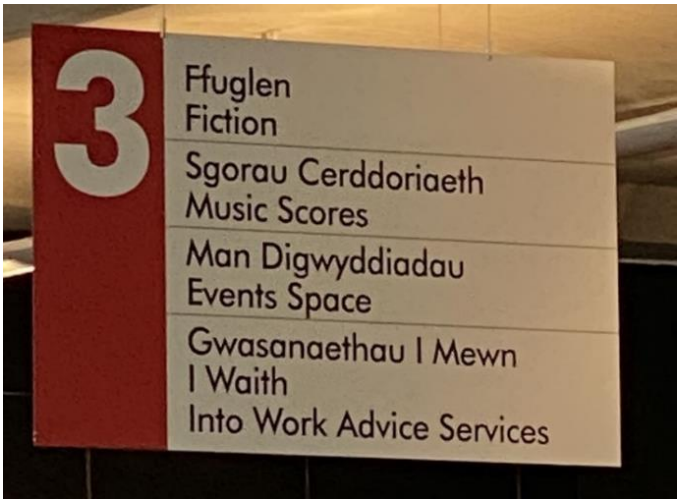


Figure 4-9: An example of bilingual signs without any clear distinction between English and Welsh, which was perceived as inaccessible for people with a learning disability

Conversely, the organisation's office garnered positive feedback, which can be linked to its numerous signage levels, enhancing its perceived accessibility. The building exterior had two clear labels with the building name, one on the entrance (see Figure 4-6). The entrance and the lift had a directory of all the offices, with their logos and suite numbers, at eye level. On each floor, each conjunction has directional signs with the office's name and logo at eye level (see Figure 4-10). The presence of clear and well-placed signage may have made it easier for participants to navigate the space, making it feel more accessible, noting that it is a small-sized building.



Figure 4-10: Different levels of signs in the office building all at eye level

Consultations

To support the collaborative interpretation and validation of the findings, the results were discussed in detail with the facilitator and the organisation. They reviewed the findings and confirmed that they accurately reflected the participants' views. They noted that if the number of interviews were doubled, the results would likely remain consistent. They also affirmed that people with a learning disability tend to have a favourable opinion of commercial buildings (e.g., shopping centres and retail stores) and hospitality buildings (e.g., restaurants and coffee shops).

Following these deliberations, *Cardiff Metropolitan Shopping Centre* was selected collaboratively as the case study for the research. This name is used as a pseudonym to ensure anonymity; no actual building by this name exists. Several key factors contributed to this decision:

1. **Positive feedback on commercial buildings:** Participants provided the most positive feedback on commercial buildings. Hence, it fosters a comfortable and familiar venue for the walking interviews. The favourable perception of retail spaces would likely allow participants to feel more at ease during the study. Furthermore, the familiarity of the location renders the participants experienced users, which further enhances their feedback and insights.
2. **Location:** The centre is situated in the city centre, where many of the organisation's events occur. This makes it a relevant and accessible location for participants, as it is part of their daily routines.
3. **Scale of the building:** The centre's size and layout enable the investigation of a wide range of architectural elements and spatial attributes, which would not be feasible in smaller spaces like a restaurant or coffee shop. Noting that, the research aimed for a holistic understanding of accessibility rather than focusing on a specific architectural feature. Hence, the varied spaces within the centre provide a richer context for the research.
4. **Convenience and accessibility:** The centre has no entry restrictions, offers free access, and provides ample space, allowing researcher, facilitator and participants to remain on-site for extended periods as necessary. This accessibility was crucial in selecting the centre as the case study.

Implications for the next research stage

The methodological findings from this stage were crucial in shaping the next one, promoting a more inclusive research environment for both the facilitator and the participants. While the architectural insights guided the development of the walking interview questions in the subsequent stage, facilitating a more focused

investigation of the spatial elements identified as significant during this stage. Regarding the methodological insights, several key actions were considered for the subsequent stage:

1. **Collaboration:** The ongoing collaboration with the organisation and the employment of the facilitator should continue, as consultations and observations had proven invaluable in supporting the research process and ensuring its accessibility.
2. **Verbal communication:** All interactions, including recruitment, would emphasise face-to-face verbal communication, with the addition of converting the participant information sheet into video format. Furthermore, all data would be provided in Easy-Read format to ensure accessibility for participants with diverse communication needs.
3. **Cue cards:** Due to their effectiveness in boosting participant engagement, they were employed in the next stage, further enhancing participant interaction.
4. **Interview logistics:** To improve accessibility for the facilitator, the interview questions for the next stage were transcribed onto cards, and a wireless recording device was employed.
5. **Incentives:** Participants valued receiving a participation certificate as a gesture of appreciation for their time. Consequently, they were reused in the subsequent stage.
6. **Extended time and budget:** Based on the insights gained, more time and budget were allocated for the walking interviews, as well as for continued collaboration, which was found to be critical to the success of the fieldwork implementation.

Conclusion

This chapter outlined the first research stage, Scoping, which involved conducting interviews with people with a learning disability to identify their preferences for various buildings around Cardiff for the case study selection. The stage began with preparation, including a literature review on best practices for interviewing people with a learning disability and consultations to ensure an inclusive research environment. As a result, the data collection was tailored to enhance accessibility for participants. Key accessibility measures included employing a disabled facilitator, using cue cards, and ensuring effective verbal communication. The collected data were analysed using reflexive thematic analysis. This approach allowed for a comprehensive examination of the gathered data, providing both qualitative insights into building preferences and accessibility, as well as deeper reflections on the research process itself.

The findings of this stage can be categorised into three sections. The first was the selection of the case study to be the Cardiff Metropolitan Shopping Centre. Second, the methodological insights including the vital role of the facilitator and prompts. Lastly were the architectural insights, including the role of familiarity, social experience and signs in accessibility. This stage established a solid foundation for the next research stage, which will explore the architectural barriers that people with a learning disability face in detail, guided by the insights gained here.

5. EXPLORING

This chapter presents the second research stage, Exploring. It identifies the barriers people with a learning disability face within shopping centres through walking interviews.

Introduction

The previous chapter detailed the first research stage, Scoping, with three main outputs: the selection of Cardiff Metropolitan Shopping Centre as the case study, methodological and architectural insights guiding walking interviews in this stage. This chapter presents the second research stage, Exploring. During this stage, walking interviews were conducted with people with a learning disability to explore the various barriers they face in the Cardiff Metropolitan Shopping Centre.

Similar to all the fieldwork chapters, this chapter consists of four sections: preparation, data collection, analysis and findings (see Figure 5-1). The preparation began with a literature review on shopping centres. The researcher then conducted familiarisation activities, including a pilot study with the facilitator, to ensure stage accessibility. The interview structure was developed and discussed with the facilitator through consultations. Finally, the ethical approval was obtained. Data were then collected via walking interviews. Reflexive thematic analysis was used to identify themes, with reflections during employment. Finally, findings were synthesised but not validated through consultations, as this is the focus of next research stage, Synthesising.

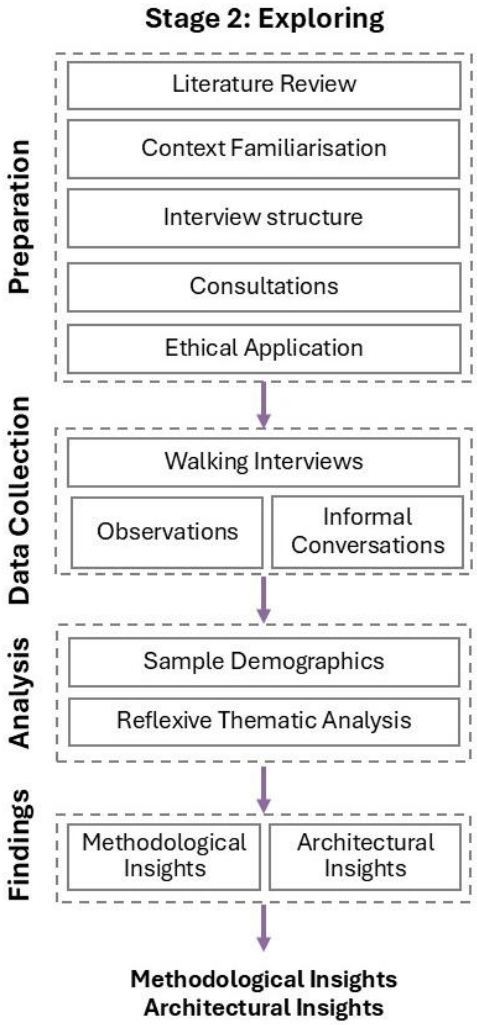


Figure 5-1: The chapter structure encompassing four sections

Preparation

Given the nature of this stage, the preparation involved a variety of activities (see Figure 5-1). It began with a review of the literature on shopping centres to help identify the interview topics. Following this review, familiarisation with the centre took place, including site visits, mapping, and identifying the centre's accessibility features. The walking interview questions, implementation techniques, and participant-facing documents were then developed after a pilot study with the facilitator. Subsequently, consultations were held, during which the facilitator reviewed the participants' materials to ensure that the interview process was inclusive and accessible. The final section of the preparation included the ethical application process, which was completed prior to the commencement of data collection. This iterative nature of the preparation phase underscored the participatory essence of the study, with each step co-designed alongside the facilitator.

Literature review

Cardiff Metropolitan shopping centre was selected as a case study based on several factors, including participant feedback, location, scale, and convenience. Notably, existing literature on shopping centre accessibility highlighted that they can be challenging environments (Technical Committee B/559 2018; MacLennan et al. 2023). However, these sources do not specifically address the needs of people with a learning disability, but they emphasise the potential to unfold various barriers as challenging environments. This literature review explores the architectural, experiential, and accessibility aspects of shopping centres. It draws on interdisciplinary sources, including architecture, urban planning, and disability studies.

Shopping centre definition

Shopping centres, sometimes called shopping malls, can be described as either covered or open-air spaces housing numerous shops that encompass a variety of businesses (Rahimi and Khazaei 2018). Previous research highlighted different categorisations for the different typologies of shopping centres, including by scale, retail offer, control, spatial form and location (Coleman 2006; R. DeLisle 2009; Rao 2020).

Coleman organised shopping centres by location and accommodation type, identifying three principal categories, of which two, out-of-town suburban and town-centre shopping, were well established in the UK by the mid-1960s. The third, "new emerging" types, served as a catch-all for formats not derived from the first two. Coleman noted that as the industry matures, many recent schemes become hybrids straddling multiple categories (Coleman 2006) (see Figure 5-2).

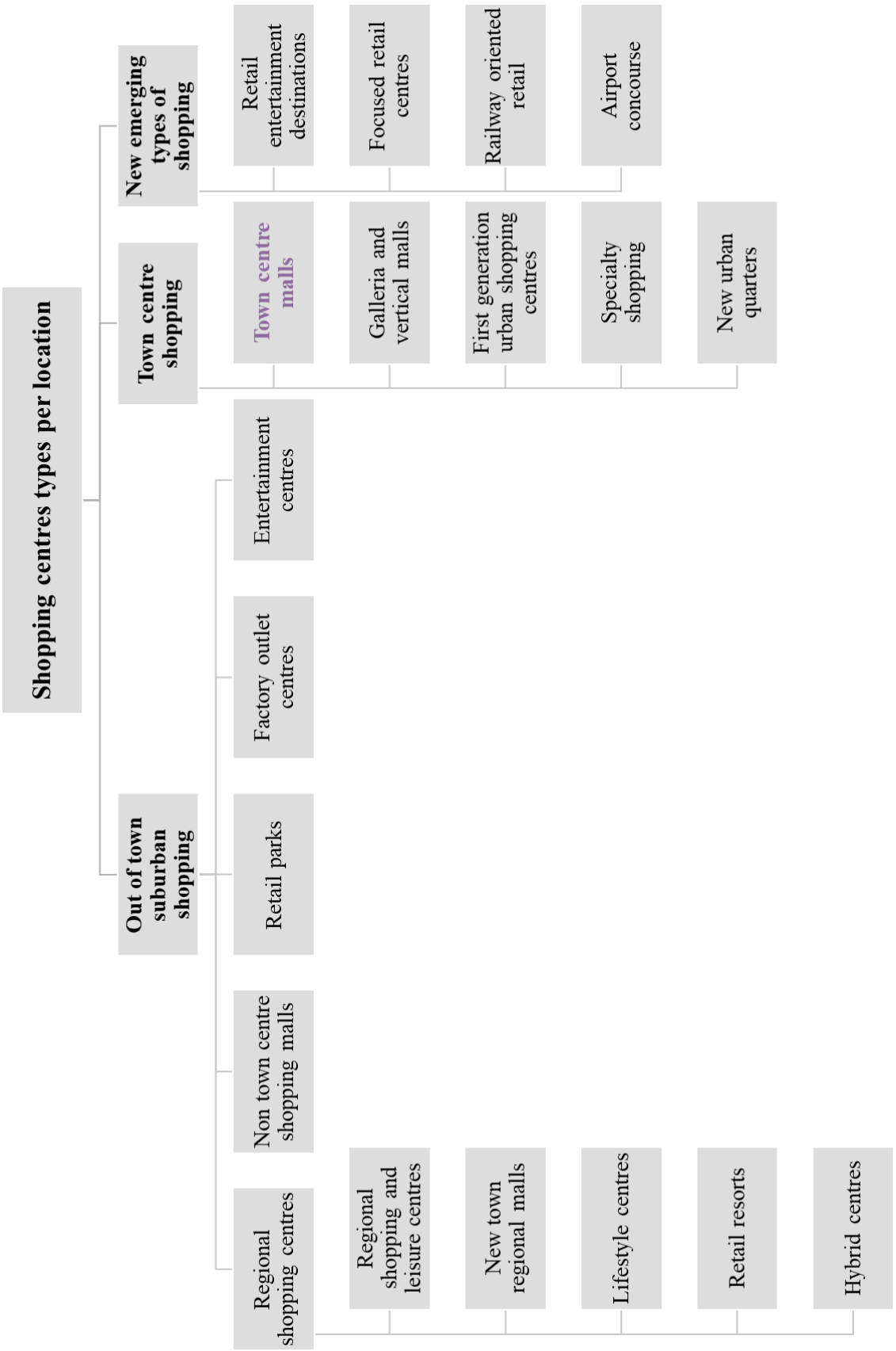


Figure 5-2: Shopping centre types by location, where the type of case study is highlighted, adopted from (Coleman 2006)

Shopping itself has transcended its transactional essence and has become a fundamental requirement of social life (Erdogan et al. 2023). Consequently, the design, layout and interiors of shopping centres have gained increased attention as they are central to the shopping experience (Vernet 2007; Zhou and Liu 2021). Currently, shopping centres have emerged as emblematic symbols of urban development (Kärrholm 2012). As one of the most common structures of the era (Aktas 2012), renowned architects, including Jean Nouvel, Rem Koolhaas, Herman Hertzberger, Ben van Berkel, Caroline Bos, and Daniel Liebeskind, participated in designing shopping centres (Kärrholm 2012).

Shopping centres began to appear in the UK some 50 years ago (Coleman 2006). While exact current figures for the total number of shopping centres are unavailable, data from 2017 indicated that the UK had 1,522 shopping centres, the highest number in the Western European region (International Council of Shopping Centers 2017). As of 2011, 52% of shopping centre floor space in the UK was built before 1990, while 21% was constructed in the 1990s and 27% since 2000 (Deka 2012). Consequently, over half of all retail space in the UK is either outdated or no longer meets the needs of current needs (Coleman 2006). Many also do not meet accessibility standards, as Part M of the Building Regulations was introduced in 1997, the UK ratified the CRPD in 2009, and the Equality Act came into force in 2010.

Consequently, much of the future architectural work in shopping centres will involve modernising them in a sustainable and sensitive way (Coleman 2006), including accessibility. Since shopping centres play a pivotal role in the urban landscape, particularly as hubs for leisure activities in large urban areas, ensuring their inclusivity and accessibility is imperative to foster societal integration and autonomy among diverse populations, including disabled people (Afacan 2012).

As quasi-public environments that fulfil a public function while being privately owned, shopping centres should be designed to accommodate a wide range of individuals instead of catering solely to specific groups (Pimlott 2007). Consequently, understanding and addressing the multifaceted nature of public spaces within shopping centres is essential for creating environments that foster inclusivity and accommodate diverse populations, including disabled people. By recognising the communal aspect of these spaces and implementing inclusive design strategies, shopping centres can serve as welcoming and accessible hubs for all members of society (Kärrholm 2012).

The evolving role of the shopping centre

The historical trajectory of shopping spaces reveals their significance as foundational elements of everyday life (Rahimi and Khazaei 2018). A pivotal transformation unfolded during the ascent of capitalism and the Industrial Revolution, reshaping the dynamics between production and consumption (Erdogan et al. 2023). This era marked a turning point, propelling consumption beyond its original purpose of meeting basic needs and paving the way for the rise of contemporary shopping centres. Later in the twentieth century, a manufacturer-dominated distribution system facilitated modernisation and enhanced the systemisation of retailing (Kent 2007).

Although department stores offered novel shopping experiences from the nineteenth century, more typically, hierarchical shop structures and shop-keeping cultures emphasised functionality and formality. A sales-led focus dominated much of retailing, a strategic and operational direction that remains evident even in London's prime shopping locations (Kent 2007). The earliest prototypes of these centres deviated from traditional city layouts, ushering in a significant departure by reconfiguring public life within enclosed and introverted spaces (Erdogan et al. 2023) (see Figure 5-3).

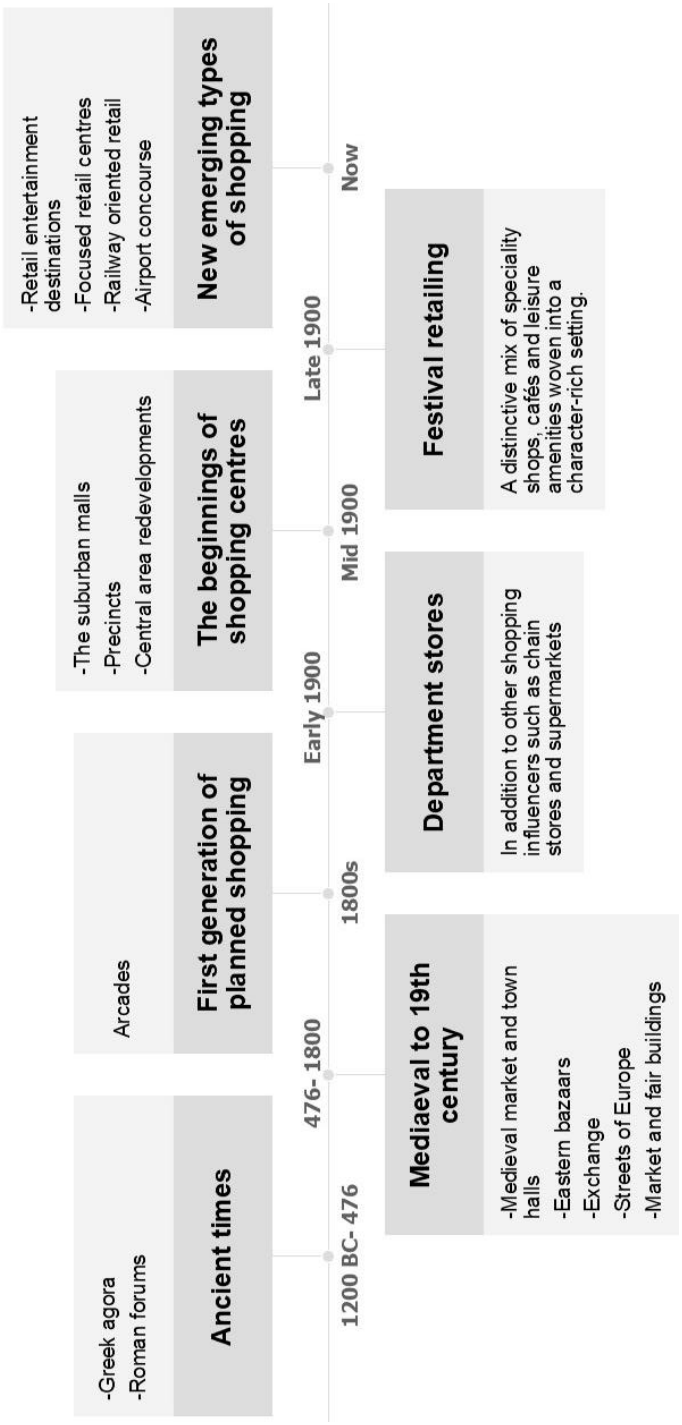


Figure 5-3: The evolution of shopping spaces adapted from Coleman (2006)

Understanding the contemporary role of shopping centres reveals that these multifaceted spaces have gone beyond their original purpose of simple commerce and transactions (Coleman 2006; Ozorhon and Ozorhon 2014; Rahimi and Khazaei 2018; Ulvi 2019). Shopping centres, which initially emerged in the early 19th century as a way to consolidate shopping areas, have transformed into comprehensive life centres that encompass entertainment, sports, residential options, and offices, catering to people of various ages and backgrounds (Ozorhon and Ozorhon 2014). Today, shopping centres are integral components of the commercial landscape globally, serving as vibrant social hubs embedded in the fabric of communities (Rahimi and Khazaei 2018).

Customers use shopping centres throughout the week for recreational purposes (Ulvi 2019). The purposes of visiting shopping centres have expanded, and the fusion of shopping with complementary activities such as food consumption and leisure facilities has broadened the customer experience (Coleman 2006). To meet evolving customer needs, the focus has shifted to creating environments that enhance visitor comfort and encourage longer stays. The integration of entertainment and leisure elements has emerged as a global trend in shopping centre construction (Rahimi and Khazaei 2018). A substantial proportion of new developments, over a third in 2002, introduced significant leisure elements (Coleman 2006), contributing to increased profitability (Kärrholm 2012) (see Figure 5-4).

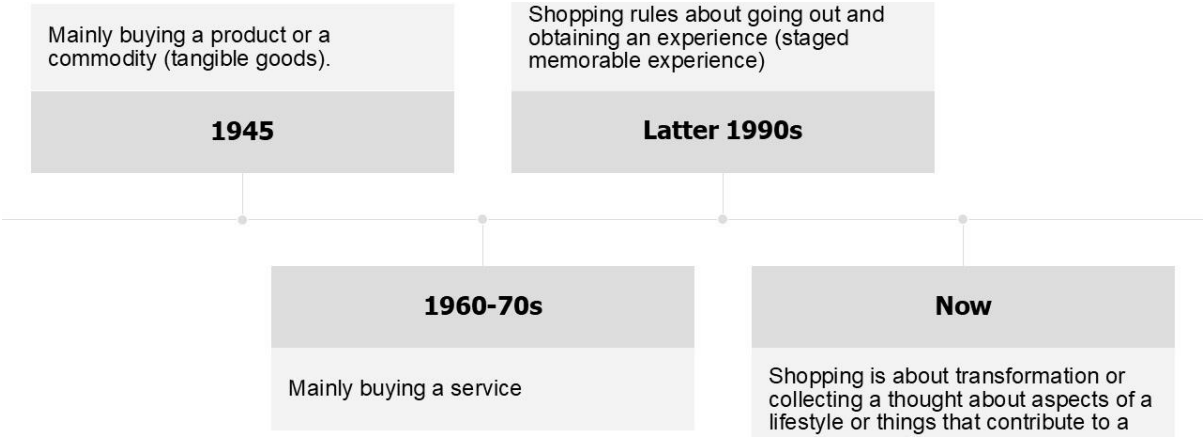


Figure 5-4: The evolution of the shopping experience adapted from (Pine II and Gilmore 1998; Coleman 2006; Avins 2019; PBS [no date])

Shopping centre design

The evolution of shopping from a simple transactional activity to a holistic experience has significantly influenced its design process. This evolution was further intensified by the standardisation of consumption patterns, often leading to a homogenisation of shopping space design that disregards regional distinctions (Erdogan et al. 2023). Thus, it is crucial to note the complex composition of functions within shopping centres, serving a diverse range of customers with varied needs and expectations (Yuan et al. 2021).

Remarkably, existing literature on the dimensions of customers' experiences in shopping centres has largely overlooked the role of architectural design, impeding a

comprehensive understanding of the complex relationship between design and customer experience (Yuan et al. 2021). Additionally, literature addressing the inclusion of disabled customers in retail settings is limited (Vilnai-Yavetz et al. 2024). This lack of specificity leaves designers with limited insights into the unique characteristics of shopping centre design and its specific influences on customers' experiences.

Designers must shift their focus from designing based solely on their experiences to a more user-centric approach. Understanding that there are perception differences between customers and designers, designers must adapt their thinking and allocate their focus according to customers' demands (Yuan et al. 2021). This is especially relevant in the context of creating accessible shopping centres for disabled people. Not only are their needs often overlooked in general design guidelines, but the overall perspective of customers is frequently disregarded as well. Previous research showed that disabled shoppers often encounter situations where their needs and rights are ignored, limiting their enjoyment of the shopping environment (Vilnai-Yavetz et al. 2024).

In a study by Afacan (2012) on shopping centres that included disabled users, most participants stated that the current shopping environment does not adequately consider diverse user expectations, and public spaces are often designed for the average person, resulting in exclusion. The top challenges included circulation, entering and exiting, wayfinding, obtaining products/services, and public amenities, among others (Afacan 2012). These challenges can evoke stress, leading to a decrease in the frequency of visits. Therefore, more research is needed on inclusive shopping environments for disabled individuals, emphasising the wide range of needs to improve understanding of how they interact with environmental stressors and enhance inclusivity in shopping areas (Vilnai-Yavetz et al. 2024).

Design guidelines for shopping centres

The layout of shopping centres, while appearing simple with pedestrian flows intersecting numerous shops, conceals the intricate factors that shape customer experiences (Rao 2020). The interaction between tangible and intangible elements has a significant impact on customer perceptions. Tangible aspects, such as sounds and lighting, along with design elements like layout, create the physical context for intangibles that pertain to social interactions (Kohijoki and Koistinen 2019). Previous literature outlined fundamental design principles for shaping these elements, which can be divided into three key principles: accessibility, identifiability, and humanisation.

- Accessibility principle

The organisation of internal spaces in shopping centres significantly influences customer movement and the layout of commercial areas (Yuan et al. 2021; Zhou and Liu 2021). Reasonable selection and design of space combinations ensure maximum accessibility and enhance the customer experience (Zhou and Liu 2021). Visibility and convenient accessibility for stores and merchandise through circulation layouts are essential, considering customers' wayfinding and orientation (Yuan et al. 2021). This includes vertical circulation, which should be strategically located for easy customer

access, discoverability, and efficient evacuation, thereby contributing to the overall organisation of the space (Zhou and Liu 2021). Stairs, lifts, and ramps should comply with building regulations to ensure safety, and horizontal and vertical circulation elements should be carefully integrated to avoid disrupting the spatial organisation (Ulvi 2019).

- Identifiability principle

Establishing robust pedestrian flows requires careful consideration of the generators of foot traffic, which may include anchor stores, major attractions, and strategic elements related to access and vertical movement. These generators can be strategically placed in geometric layouts such as linear, keyhole, and circuit configurations (see Figure 5-5) (Coleman 2006). Linear layouts offer a clear spatial structure, enabling customers to easily grasp the overall layout through local spaces (Zhou and Liu 2021). Keyhole layouts are based on a single point of entry and return from a high street, and circuit layouts encourage continuous circulation past all the storefronts and a return to the starting location (Aigbe et al. 2024). Redirections should be visible, perceivable, and audible (Ulvi 2019). Similar to landmarks in public spaces, stores also need focal points, often achieved through effective advertising (Yuan et al. 2021).

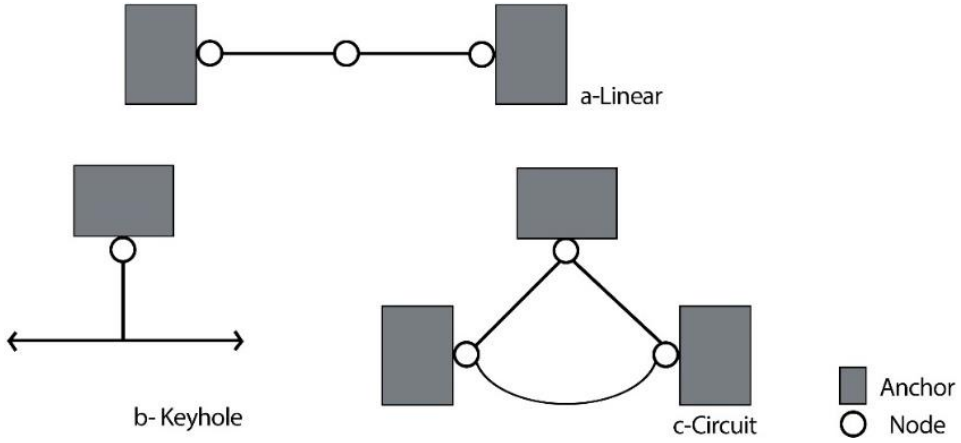


Figure 5-5: Traditional geometric layouts in shopping centres adapted from Coleman (2006)

- Humanisation principle

Customers are the focal point of shopping centre services; hence, the spatial layout should prioritise a "people-oriented" approach (Zhou and Liu 2021). The humanisation of shopping centres aims to create environments that respond to human needs and promote social interactions (Rahimi and Khazaei 2018). Furthermore, creating a safe and secure environment has become a key consideration in shopping centre design (Coleman 2006). For example, the surface materials should be non-slip to ensure the safety of users (Ulvi 2019).

Future of shopping centres

Shopping centres have faced criticism for representing spaces based on the ethos of consumption, acting as symbols of urban capitalism (Ozorhon and Ozorhon 2014). They illustrate the temporary nature of architectural trends as designers constantly strive for

contemporary relevance, resulting in even the most esteemed designs having fleeting lifespans. Historically, they occupied a peripheral role in architectural discourse, seldom attaining significant recognition within the realm of architectural education (Kärrholm 2012).

In the discourse of architecture, the concept of "junkspace," as defined by Rem Koolhaas, delineates the residue of human activity on the planet, manifesting as a consequence of ongoing modernisation. Koolhaas characterised “junkspace” as a byproduct of modernisation, one that proliferates amidst the deployment of seamless infrastructural elements, such as escalators, air-conditioning systems, and fire safety measures. A realm where disorientation finds promotion through deliberate design strategies employing reflective surfaces, sleek finishes, and echoing spaces (Koolhaas 2002).

Koolhaas's depiction of shopping centres aligns with the concept of “junkspace”, ubiquitous, homogenised, and enclosed environments intentionally designed to envelop inhabitants within their confines (Uppunda 2020). These spaces are often intentionally designed to limit external stimuli by excluding natural light and obstructing exterior views, creating ‘black box’ interiors, and enforcing a detachment from the outside world through complex layouts and concealed exit routes. Contrasting with the accessibility needs of people with a learning disability, simple layouts and clear entrances.

Nevertheless, contemporary trends in shopping centre design indicate a potential transformation, signalling a departure from traditional paradigms. Integrating outdoor spaces and the evolving societal perspective suggests a new purpose for these buildings. There is a growing realisation of shopping centres as potential wellbeing hubs, serving as inclusive spaces for a broad spectrum of society (Kohijoki and Koistinen 2019). The emerging role of shopping centres as multifunctional spaces highlights the evolving responsibility of architects to reimagine these areas beyond their traditional limits, transforming them into dynamic, inclusive, and socially engaging environments.

Contemporary shopping centre design challenges traditional guidelines by promoting open streets and smaller blocks. Recent research highlights a preference for natural environments with ample daylight, enhancing outdoor connections and reflecting local characteristics (Coleman 2006). The enclosed, climate-controlled models have declined over the past five decades, prompting the development of new designs. Incorporating daylight through atria and choosing street furniture and landscape elements helps integrate urban fabric within shopping centres, creating an illusion of openness (Erdogan et al. 2023).

This approach creates a new urban centre that blends open or covered streets with the benefits of a planned, centrally managed shopping experience. It merges the cultural and civic aspects of town centres with the convenience of shopping centres. Thus, the new shopping centre is complex and multifaceted (see Figure 5-6).



Figure 5-6: The characteristics of new shopping centres adopted from (Coleman 2006; Velibaşoğlu and Pulat Gökmen 2022; Erdogan et al. 2023; Wongsunopparat and Zhang 2023)

In the future, the role of physical retail spaces may decline due to the rapid growth of online shopping driven by technological advancements and digitalisation (Erdogan et al. 2023; Wongsunopparat and Zhang 2023). To stay relevant, shopping centres must evolve into experiential destinations and service-focused hubs that offer a variety of food and beverage options (Wongsunopparat and Zhang 2023). Convenience and ease of use will be paramount, extending from arrival points to the shopping experience's overall quality (Coleman 2006).

Regarding accessibility, under the UK Equality Act (2010), retailers are obligated to make reasonable adjustments to ensure the accessibility of disabled people. Previous research suggested that more is needed to minimise the negative psychological and physical effects of environmental stressors on shoppers, and more efforts are required to create inclusive shopping centres that capture the “lived experience” perspective of disabled people (Vilnai-Yavetz et al. 2024).

Context familiarisation

Following this literature review on shopping centres, the focus shifts toward the specific case study selected. The case study is a multi-storey shopping centre in Cardiff's city centre. It includes both indoor and outdoor spaces, featuring shops, hospitality, and entertainment facilities. The centre administration was approached through the information desk and was informed about the study. The familiarisation with the context began by exploring the features and services available in the centre for hidden disabilities, which included:

- **Hidden disability lanyard:** The information desk provides free hidden disability lanyards to guests who require additional assistance during their visit, although subject to availability.
- **Supporting autism-friendly service:** The centre provides a weekly quiet hour during which it reduces the amount of music in the centre and its stores.
- **Guide for autistic guests:** The centre created a guide for autistic guests to help make their visit to the centre more comfortable. It provides information about toilets, lift areas, quiet periods and more. Since this guide targeted autistic guests, it was discussed with the facilitator to assess its accessibility for people with a learning disability. The facilitator noted many inaccessible features in the guide for people with a learning disability (see Figure 5-7, Figure 5-8 and Figure 5-9).

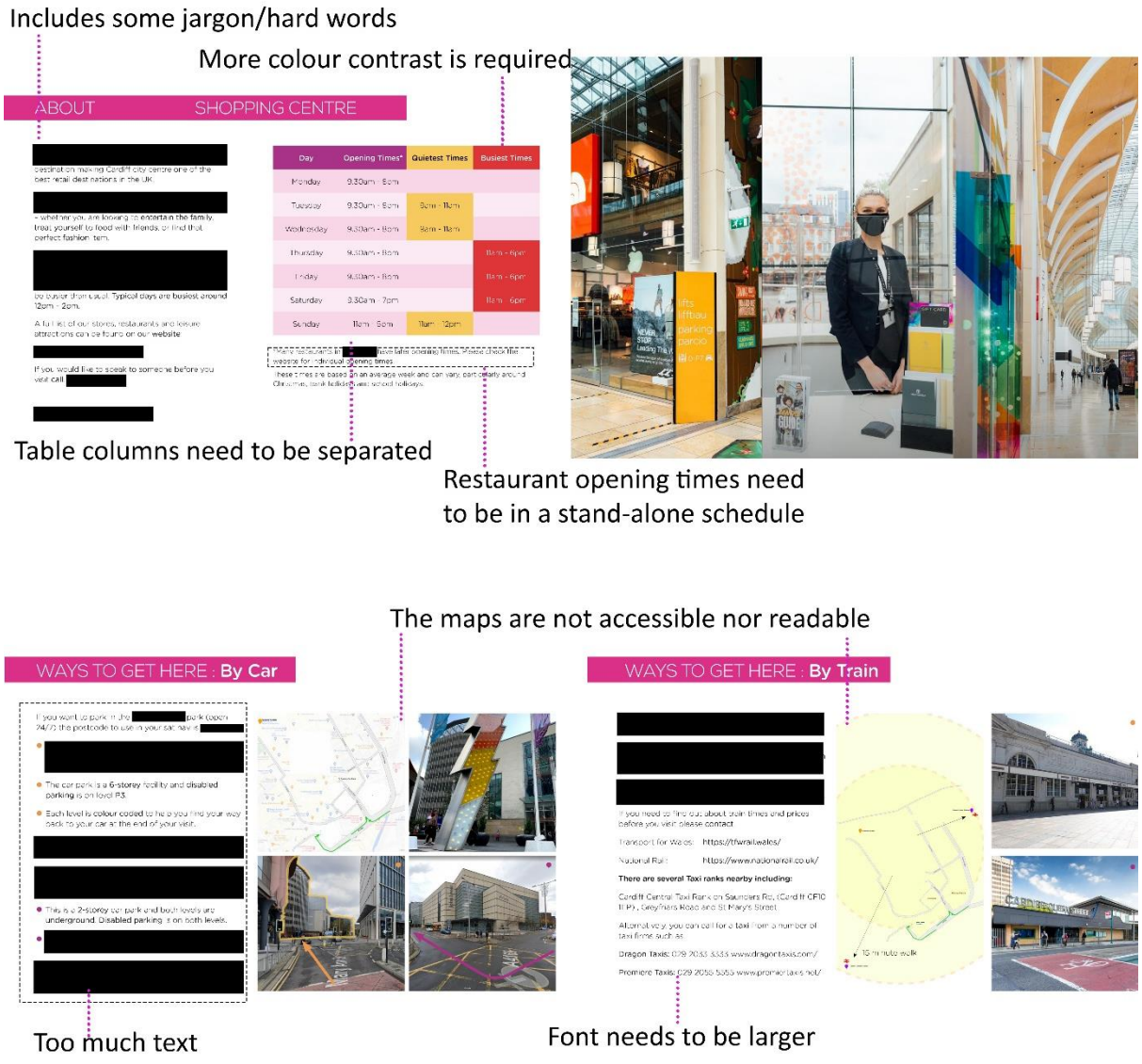


Figure 5-7: Sample of the facilitator's comments on the accessibility of the "Guide for Autistic Guests" (identifiable information has been redacted for anonymity)

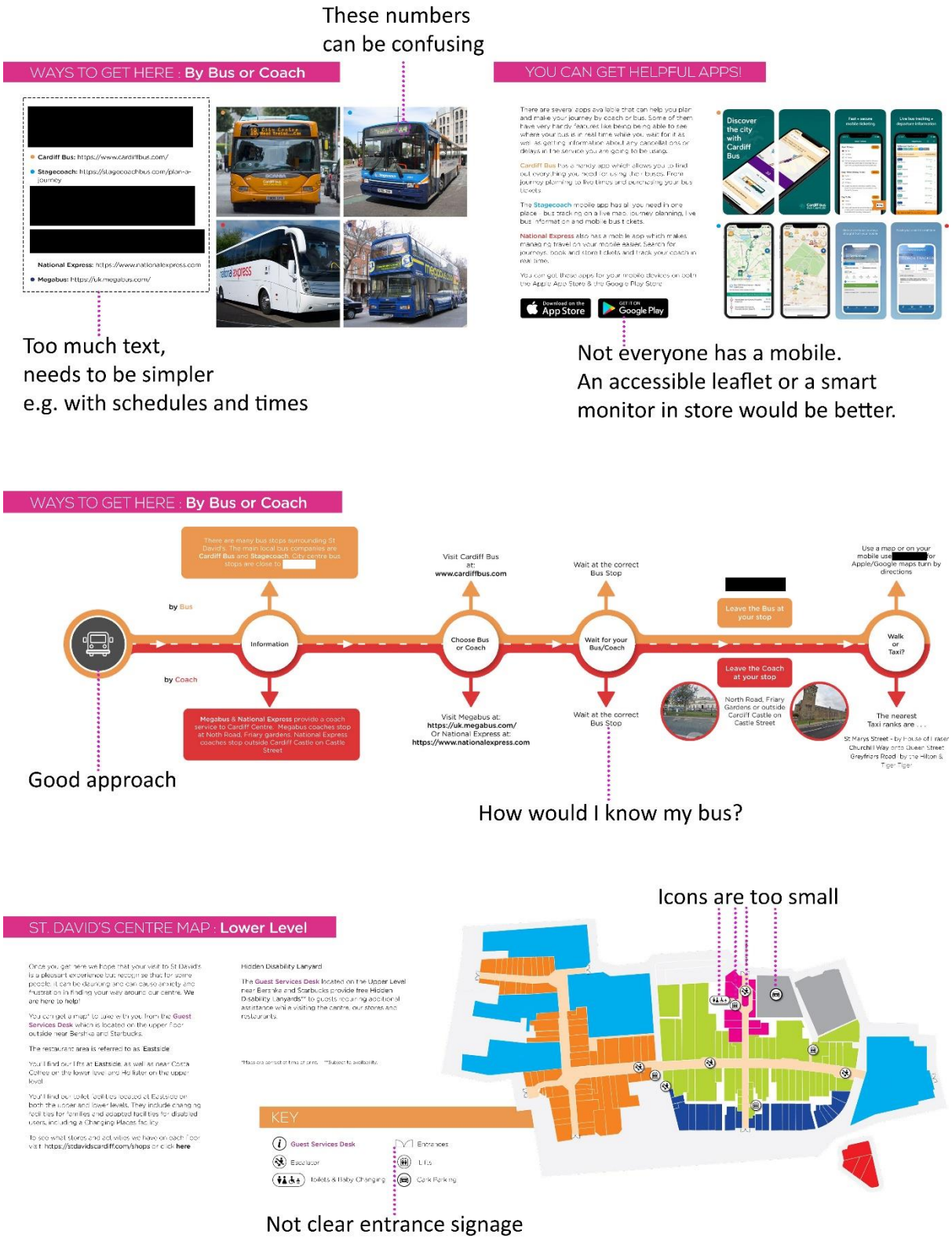


Figure 5-8: Sample of the facilitator's comments on the accessibility of the "Guide for Autistic Guests" (identifiable information has been redacted for anonymity)



Figure 5-9: Sample of the facilitator's comments on the accessibility of the "Guide for Autistic Guests" (identifiable information has been redacted for anonymity)

The comments included style suggestions such as a small font, the location of the key for maps, and a lack of colour contrast. They also included vague information on vehicular transportation and a vague/confusing selection of photos and/or logos. Although these comments are not directly related to architecture, they highlight inaccessible features when communicating with people with a learning disability.

These comments also echoed the aforementioned discussion on the needs of people with a learning disability versus the needs of autistic people. Highlighting that what works for autistic people might not work for people with a learning disability, a guide like this can still be beneficial for people with a learning disability, as it can help them plan their trip and inform them about the services available at the centre. However, the guide is only available online through the centre's website, which may not be accessible to people without internet access, as noted by the facilitator.

The context familiarisation process also included site visits by the researcher to map out key facilities around the centre, such as seats (see Figure 5-10)- in case a participant

needs a break at any time during the walk, information points- in case of emergency, interactive maps (see Figure 5-11) -for wayfinding activities, lifts- for participants with limited physical ability and toilets in preparation for the walking interviews.

To support the spatial analysis of the case study, the researcher digitally redrew the floor plans using AutoCAD. These drawings were based on publicly available maps sourced from the centres' websites. The plans were simplified to enhance clarity. Although not official architectural drawings, these redrawn plans served as analytical tools to facilitate participant engagement and thematic interpretation during the various research stages.



Figure 5-10: Seats locations around the centre



Figure 5-11: Interactive maps locations around the centre

Interview structure

This research stage aimed to answer the following questions:

- How do people with a learning disability use the shopping centre?
- What makes a shopping centre accessible for people with a learning disability?
- What barriers do people with a learning disability face in a shopping centre?
- How do different architectural elements in a shopping centre affect the experiences of people with a learning disability?

To develop the walking interview questions, a pilot walking interview was conducted with the facilitator to assess their accessibility, identify new themes, and investigate any technical issues with the interview, such as its length or tiring nature. The questions

were inspired by the barriers found in the literature for people with a learning disability and the literature on the design considerations for shopping centres.

The pilot interview lasted around 75 minutes and included twelve questions to explore the shopping centre's general advantages and disadvantages. Some questions were asked while walking around the centre, while others were asked after the walk. The interview was recorded on a password-protected mobile device, which were immediately uploaded to the university's secure cloud storage. Once the successful transfer was confirmed, the original was deleted from the phone. Additionally, observations were made during the walk, and field notes were recorded.

a) Questions during the walk

1. Where do you usually enter the shopping centre from? And why?
2. What is your favourite shop in the shopping centre/ Where do you usually go to the shopping centre/ Where do you like to go inside the shopping centre?
3. What do you think about the lighting? Is it too bright or too dark? Do you like them?
4. Are you bothered by the smell, for example, walking by a perfume shop or a restaurant?
5. What about the crowd and the noise?
6. What do you think about the navigation and the wayfinding?
7. What do you do if you want to reach a specific shop but do not know where it is?
8. Are you OK with this shopping centre?

b) Questions after the walk

9. What do you hate the most about the shopping centre, or what would you change if you were changing anything?
10. Are you bothered that the shopping centre shifts from inside to outside?
11. Do any of your friends shop here?
12. What do you like best about this shopping centre?

The pilot interview was transcribed, and the interview route was mapped (see Figure 5-12). The following barriers were identified through the analysis, which were echoed through observations during the employment role:

- **Wayfinding and navigation:** Barriers included vague navigation and unclear and inadequate signs.
- **Facilities:** The facilitator highlighted that the number of toilet locations and cubicles inside the toilets is insufficient. For example, the centre only has one toilet on the upper floor.
- **Entrance:** The entrance features numerous doors, making it somewhat confusing to determine which one to use for entry or exit. Each entrance or exit comprises several doors, varying between automatic and manual, with no indication of which is for entering and which for exiting (see Figure 5-13), echoing Daisy's comment mentioned in the previous chapter.



Figure 5-12: The pilot interview route



Figure 5-13: One of the shopping centre's entrances featuring multiple doors without labels

The pilot interview also discussed the centre's sensory environment, which the facilitator had no problem with. However, some navigational tasks made it clear that it is not easy to get around the centre. In addition, although the facilitator is a frequent visitor, she was unaware of the centre's accessibility features, such as the hidden disability lanyard, autism-friendly services, the guide for autistic guests, the quiet room mentioned in the guide, or interactive maps.

Interview question design

Following the analysis of the pilot interview, the interview questions were developed. There were two versions of the interview questions: i) for frequent visitors who visit the centre once a month or more, and ii) for first-time and non-frequent visitors who visit the centre less than once a month. Following the findings from the previous research stage, which indicated that familiarity influences how people with a learning disability perceive buildings, both versions maintained a similar structure:

1. **Eligibility questions and demographic questions:**
   The first part of the interview included eligibility and demographic questions, with four mandatory and one optional question. These questions were designed to gather basic demographic information while ensuring that participants met the study's eligibility criteria. The last question in this section asked about the frequency of visiting the centre to decide the structure of the interview. The questions were as follows, noting that mandatory questions are marked with *:
   1. How old are you? *
   2. Are you male/female/other?
   3. Do you have a learning disability? *
   4. Do you live in Cardiff? If the answer is no, do you visit Cardiff? *
   5. How often do you go to St. David's shopping centre? *
      i. Once a month or more
      ii. Less than once a month
2. **Questions during walking around the centre:**
   This part of the interview included 33 questions for frequent visitors and 28 questions for non-frequent visitors, where some questions about preferences were removed. In both scenarios, the questions were divided into five categories. preferences, sensory environment, centre facilities, wayfinding, navigation and department stores (see Figure 5-14). The questions in this part and the following one were inspired by the findings of previous literature on accessibility for people with a learning disability, previously reviewed in Chapter 2, the findings of stage 1, the literature on shopping centres, context familiarisation, pilot study, and employment experience (see Table 5-1).
   It aimed to capture the participants' experience within the shopping centre and the impact of specific architectural features on their accessibility. It included locational questions, which are questions related to the surroundings, such as questions about lighting, specifically when pointing to a light source or skylight. It also included wayfinding activities to observe how participants navigated the buildings, in addition to the utilisation of cue cards (see Figure 5-15 a).

3. **Questions after the walk:**
   Considering the length of the interview and to enhance accessibility, after completing the first set of questions, a break was taken at a location of the participants' choice, where refreshments were provided. The second set of questions was addressed in the same location as the break. This part had 18 questions in both scenarios, divided into three categories: preferences, the centre's accessibility features and wayfinding and navigation (see Figure 5-14). It aimed to understand the building experience holistically and reflect on the walking interview. Cue cards were also utilised in this section (see Figure 5-15 b).

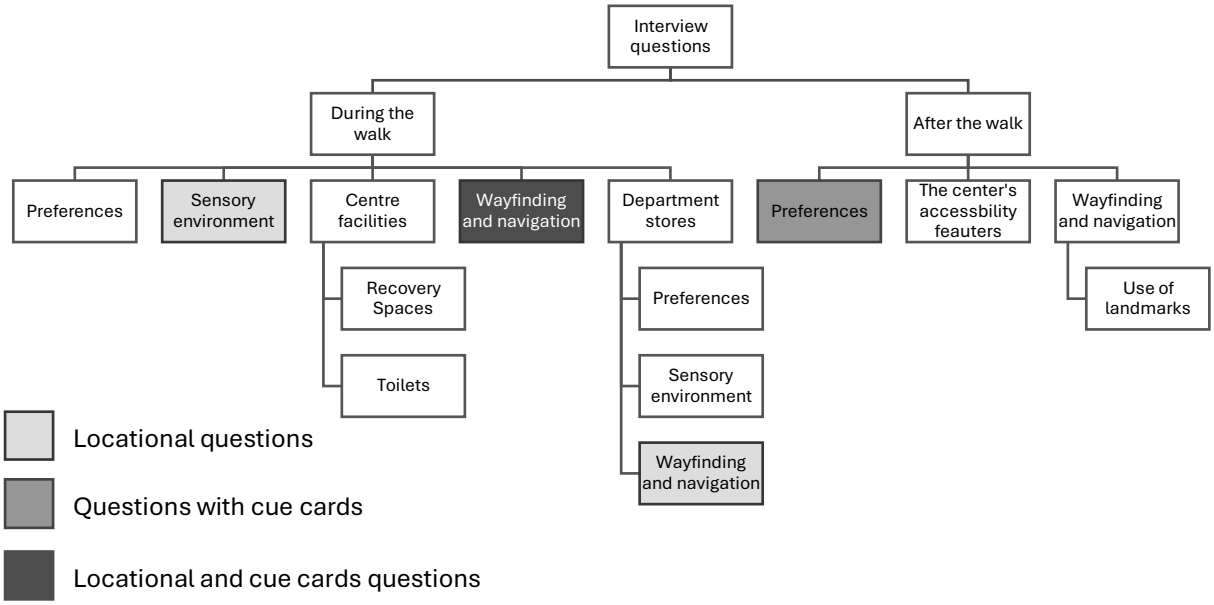


Figure 5-14: Walking interview structure



Figure 5-15: A sample of the cue cards used for the walking interviews. a) A random sample of the centre's shops for wayfinding activities, b) Shopping places/spaces around Cardiff to prompt conversation around preferences

Table 5-1: Interview questions for frequent users and their source

Question	Learning disability accessibility literature	Stage 1 findings	Shopping centres literature	Context familiarisation	Pilot study	Employment experience
During the walk						
Preferences						
1. Where do you want to start?		√				√
2. Do you think the entrance is clear enough?		√			√	√
3. What is your favourite shop here? Can you take us there?	√	√			√	√
Sensory environment						
4. Do you like the lighting here?	√		√			
5. Do you like these [occasional] decorations?	√					√
6. Is it smelly here? If yes, does it bother you?	√		√			
7. Do you think it is noisy? If yes, does it bother you?	√		√			
8. Do you find it crowded here? If yes, does it bother you?			√			√
9. Do you like the materials of floors, ceilings and walls?			√			√
10. Do you like the colours of the walls, floors, and ceiling?			√			√
Centre facilities						
11. Can you take us to your favourite resting space?	√		√		√	√
12. Why do you like it?			√			√
13. Do you think there is enough resting space here? Why?			√			√
14. Do you know where the toilets are? Can you take us there?	√		√		√	√
15. Do you think it is easy to find toilets?	√		√		√	√
16. Do you think there are enough toilet locations?			√		√	
17. Do you think there are enough cubicles inside the toilet?			√		√	
Wayfinding and Navigation						
18. Do you like that the centre is open and double height? Does it help you locate things better? Does it feel noisy or intimidating?		√	√			√

Table 5-1 (continued)

Question	Learning disability accessibility literature	Stage 1 findings	Shopping centres literature	Context familiarisation	Pilot study	Employment experience
19. Do you think you can move easily between floors?		√	√		√	√
20. Do you think the signs are clear? Why?	√	√			√	√
21. Do you know/use any shortcuts here? Can you show it to us?	√					√
22. Activity 1: The participant is shown pictures of random shops in the centre. They choose one they have not been to and then try to find it.	√	√			√	√
23. Activity 2: The participant is shown pictures of random shops in the centre. They choose one that they have not been to and then try to find it using interactive maps around the centre.	√	√		√	√	√
Department stores						
24. Do you have a favourite department store [Department stores' names]? Can you take us there?	√		√		√	√
25. Are you confident in coming here alone and going shopping? Why?		√				√
26. Do you like the lighting here?	√		√			
27. Is it smelly here? If yes, does it bother you?	√		√			
28. Do you think it is noisy? If yes, does it bother you?	√		√			√
29. Do you find it crowded here? If yes, does it bother you?	√		√			√
30. Do you like the materials?		√				√
31. Do you like the colours of the walls, floors, and ceiling?		√	√			
32. Do you think it is easy to find what you need here? Why?	√				√	
33. Do you think the signs are clear enough? Why?	√	√			√	√
After the walk						
Preferences						
1. Do you prefer this shopping centre or open centres/ shopping streets? Why?		√				√
2. How often do you come here?		√				√
3. How do you spend your time here? / Why do you come here usually?		√				√
4. Do you like shopping here?		√				√

Table 5-1 (continued)

Question	Learning disability accessibility literature	Stage 1 findings	Shopping centres literature	Context familiarisation	Pilot study	Employment experience
5. What is your favourite thing about this centre?		√				√
6. Do you think other people with a learning disability might like this centre? Why?		√				√
7. What do you hate about this centre?		√				√
8. If you can change/add anything here, what would you change?	√		√			√
9. Are you confident in being here alone? Why?		√				√
10. When you first came here, do you remember something that was inaccessible then and is fixed now, or have you gotten used to it now?					√	√
11. What advice would you give an architect/designer of shopping centres?			√			√
Wayfinding and navigation						
12. Do you think it is easy to get around the centre?	√	√			√	√
13. What do you think about the centre moving from inside to outside?		√			√	√
14. Do you know any shortcuts here?	√	√			√	√
15. Can you give me directions from where we are seated now to the shop we visited earlier?	√	√			√	√
16. Did you know that the centre offers assistance to hidden disabilities through the reception desk and a quiet room if you get overwhelmed? If the answer is no, now that you know it, would you consider using it?				√		√
17. The centre has a brochure to support autistic users. What do you think of this brochure? Is it of any benefit to you? Why?				√		√
18. Do you use different clues/landmarks in the centre to help you get around? If yes, what are these landmarks/ clues?	√	√			√	√

The interview route depended on the participant's familiarity with the centre. A route was partially designed for non-frequent visitors (see Figure 5-16). While there was no pre-determined route for frequent visitors, the participants led the route.



Figure 5-16: The interview route for the non-frequent users, where questions are strategically localised to correspond with the questions being asked. It stops at question 15, as the wayfinding activities begin from question 16, and consequently, the route will follow the participant's lead

Consultations

After preparing the interview questions and cue cards and setting their structure, the participant information sheet and consent form in Easy-Read were also prepared. Similar to the first stage, the facilitator reviewed them all and recommended transforming the participant information sheet into a video. Additionally, the participation certificates were also utilised following the positive feedback they received from the participants in the previous stage (see Appendix 3, p. 290).

Finally, inspired by the findings of the previous stage, to enhance accessibility for the facilitator, the interview questions were transcribed on cards in different sets, each set

representing a part of the interview (see Figure 5-17). During consultations, the facilitator requested that the question cards be colour-coded; for example, the locational questions were coloured green, and the questions with cue cards were coloured blue (see Figure 5-18).

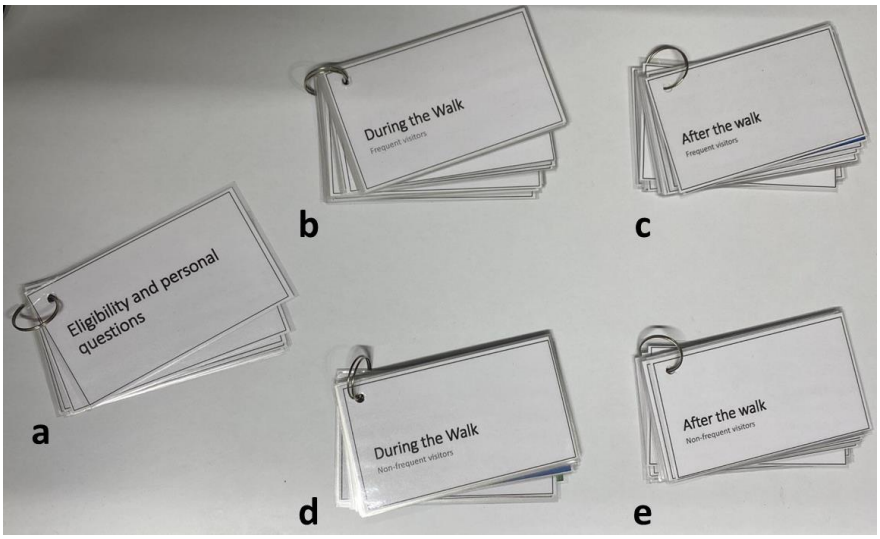


Figure 5-17: The interview questions were divided into five sets of cards: a) eligibility and personal questions, b) during the walk for frequent visitors, c) after the walk for frequent visitors, d) during the walk for non-frequent visitors and e) after the walk for non-frequent visitors

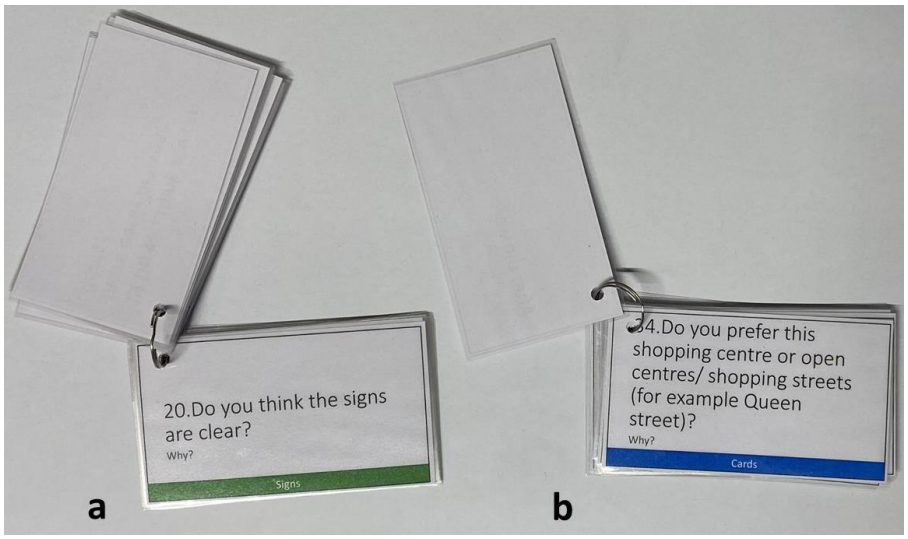


Figure 5-18: Question cards colour coding a) locational questions coded green with a hint of the architectural feature, b) cue cards questions coded blue.

Ethical application

Following the consultation with the facilitator, an application for ethical approval was submitted to The Welsh School of Architecture's Research Ethics Committee, and approval was acquired (SREC no. 22111) (see Appendix 4, p. 291).

Since the participants' well-being was prioritised in this research, some ethical strategies were followed:

- If any question invoked distress, it could be left unanswered.
- The researcher attended several training sessions on supporting people with a learning disability. In addition to continued employment with the organisation, to enhance understanding of the different accessibility needs.
- Collaboration with the organisation and the employment of the facilitator continued, as they proved invaluable in the previous stage. Notably, the preparation of this stage highlighted a higher level of involvement with the facilitator.
- The data collection focused on verbal communication. Hence, the participant information sheet was converted into a video, and the screen reader and online versions of the participant-facing materials were omitted, as the participants did not use them during the first stage. Additionally, the recruitment process did not include flyers or any written materials; it primarily relied on word of mouth. Moreover, all participant-facing materials were in Easy-Read.
- The research plan regarding time and budget was revisited to allocate more time and budget for this stage, ensuring that communication with participants was not rushed and accommodating the facilitator's employment.

Data Collection

The eligibility criteria for this stage were the same as those for the previous stage: participants had to be over the age of 18, have a learning disability, and live in Cardiff or visit it regularly. Participant recruitment was also conducted by the same organisation. However, noting that the walking interviews were longer than the previous interviews, the facilitator contacted potential participants in advance to schedule an appropriate timeslot with them. Given that convenience sampling was employed, the sample size was determined by data saturation.

The interview began outside the centre, starting with the participant information video, followed by the signing of consent and the answering of eligibility questions, before moving inside. Following this, participants received an Easy-Read version of the participant information sheet and consent form for their records, along with the participation certificate.

To ensure data accuracy and security, interviews were audio-recorded using the researcher’s mobile phone and wireless microphones with sound isolation properties, following the recommendations of previous literature (King and Woodroffe 2019). The microphones were attached to both the facilitator and the participant. The audio files were then promptly transferred to the university’s secure cloud storage to ensure confidentiality and proper data management and deleted from the phone.

As discussed earlier, the walking interviews were divided into two parts with a well-being break between the two sections in which the participant can sit down and have a refreshment (see Figure 5-19). Some longer interviews had a break in the first section upon the participants’ request.



Figure 5-19: The facilitator and Summer during the second part of the interview

The length of walking interviews varied considerably based on participant choice, with some extending beyond three hours. While this flexibility was central to ensuring accessibility and comfort, it also introduced ethical considerations related to informed consent. To address this, participants were made aware prior to the session that the duration was flexible and based on their preferences and were reminded that they could pause or stop at any time without consequence.

To enhance the accessibility of the interviews and increase engagement, the facilitator, a familiar face to the learning disability community in Cardiff, helped pose the questions. The researcher followed up with questions, noted observations, mapped the route, and ensured a smooth interview process. This allowed the researcher more space to record observations and less intrusion. Notably, the researcher had become a familiar face in the learning disability community in Cardiff through employment, which enhanced participants' engagement. Since the interview route was participant-led, if the participants were familiar with the building, the routes, length of the interviews, and breaks taken varied between participants.

The reflexive thematic analysis was conducted concurrently with the interviews to identify emerging themes. No new themes emerged after the 14th interview. A total of 18 interviews were conducted, which was deemed sufficient to capture a comprehensive range of perspectives and achieve data saturation at this stage. Additionally, this number was within the accepted range noted by Braun and Clarke for medium projects and studies in large projects previously mentioned in the Methodology chapter (Braun and Clarke 2013).

Beyond recording participants' spoken words, additional decisions needed to be made regarding the collection of spatial or place-based data generated by walking interviews (King and Woodroffe 2019). For example, the researcher noted particular locations and features highlighted by the participants so that during analysis, spoken words can be linked with meaningful places. This was implemented by mapping the walk against the

questions, taking notes on particular architectural features, and photography during and after the interviews (see Figure 5-20).

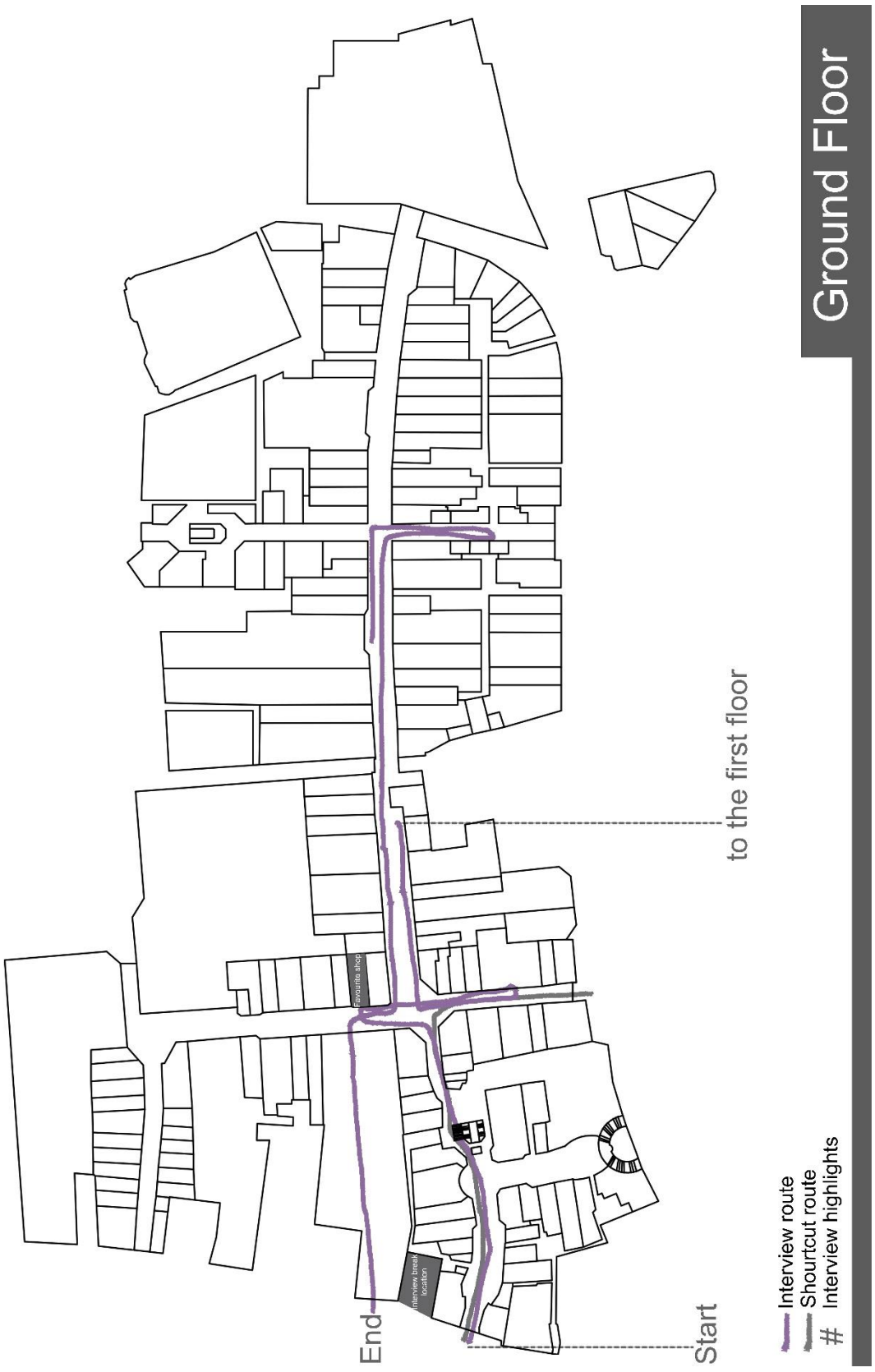


Figure 5-20: A ground floor example of route mapping against questions asked, conducted for each participant (simplified for readability)

Wayfinding activities

Wayfinding and navigation were the most recurring barriers in the literature on accessibility for people with a learning disability. Hence, wayfinding tasks were utilised seven times during the first part of the walking interviews. Five of these times were a simple question, “Can you take us there?” reflecting on a specific shop or facility based on the participant’s answer. During each task, the wayfinding and navigation process was observed and assessed.

In addition to these tasks, there were two wayfinding activities in which the participants used the cue cards (see Figure 5-15 a) to choose a shop whose location they were unfamiliar with and then try to navigate to it. The first activity aimed to understand the cues that the participants used, such as asking someone or checking a map. The second activity aimed to observe how the participants used the interactive maps in the centre to locate their selected shop.

During all these activities, various observations were recorded, including the ease of reaching a destination, the language used, and the cues utilised. Additionally, during the second part of the walking interviews, “after the walk,” the participants were asked to describe the activity they had performed earlier to explore how they perceived navigating through the building and the different wayfinding cues they used.

These different types of activities contrast with previous wayfinding studies, where participants were asked to produce a map after completing a task or answer questions about their wayfinding experience once they had finished. Both approaches would be inaccessible to people with a learning disability (Salmi 2007), hence, were avoided. Additionally, this technique helped reduce the formality of the interview process and encouraged participant engagement, as the activities were introduced as games.

Informal conversations and observations

The informal conversations and observations were conducted at various times, before, during, and after the walking interviews, providing ongoing opportunities for the researcher to engage with participants and reflect on their answers during the interviews. This engagement was further enriched by the researcher’s role as an insider to the learning disability community due to employment with the organisation. This unique position allowed the researcher to adopt the participant-observer role.

Data from these interactions included participant preferences, accessibility challenges, and daily routines, which were captured through note-taking and photography. These observations documented the community's experiences, thereby enhancing the understanding of their needs beyond the formal research setting. They proved invaluable in informing key research decisions and ensuring relevance to participant needs. The observations also provided context for the interview notes, which will be detailed in the following section.

Analysis

The analysis followed the reflexive thematic analysis approach. After transcribing the walking interviews, sorting and categorising the informal conversations, observations, notes, and photos, in addition to mapping the routes, they were collectively analysed thematically.

Sample demographics

Demographic data were analysed using simple descriptive statistics, primarily through frequency counts. The sample included 18 participants aged 36 to 65 years. Eleven participants were identified as female and seven as male. Sixteen participants lived in Cardiff, while the remaining participants visited Cardiff regularly. Some participants reported having additional conditions alongside their learning disability, including ADHD, autism, borderline personality disorder, hearing impairment, dyspraxia, dyslexia and epilepsy. The variation in age, gender, and the presence of additional conditions contributed to a more nuanced understanding of how different factors might affect the accessibility of buildings for people with a learning disability.

Reflexive thematic analysis

The reflexive thematic analysis was conducted using the phases highlighted in the Methodology chapter, Data Analysis section, shaped by the researcher’s positionality. In the familiarisation phase, the researcher identified patterns, including the role of familiarity in shaping participants' accessibility experiences, which aligns with the previous stage. Participants often highlighted the comfort of familiar spaces, such as coffee shops and restaurants, which were often part of their daily routine. These spaces were perceived as more accessible; however, participants also described a range of physical and social barriers they encountered in shopping centres. Notable barriers included wayfinding challenges, unclear signage, sensory overload, and crowded environments, which collectively contribute to the complex nature of accessibility for people with a learning disability.

During code generation, the researcher identified key codes reflecting emerging patterns, including "wayfinding and navigation are barriers," "social and attitudinal challenges," and "staff and security personnel roles." These codes were grouped into two categories: methodological insights and architectural insights, aligning with the research aims.

The methodological insights highlighted the importance of participant-led, flexible, and personalised interviews, with prompts such as cue cards aiding conversations. architectural insights included tangible issues, such as unfamiliarity with spaces, lack of recovery areas, poor signage, and sensory overload, as well as intangible issues, including communication challenges and the need for trained staff to assist people with a learning disability.

As the researcher moved to the theme review phase, the themes were further developed, leading to a more structured understanding of the barriers. The methodological insights underscored the value of flexible, participant-centred research methods, such as walking interviews, where the environment itself became a key prompt for participants, allowing them to lead the conversation and identify barriers in real-time.

The architectural insights were categorised into two sub-themes: Intangible Insights and Tangible Insights. Intangible insights highlighted the significance of clear communication, both in terms of signage and in interactions between staff and participants. On the other hand the tangible insights included unfamiliarity with layouts, insufficient recovery spaces, wayfinding challenges, and crowds, all of which contributed to the perceived inaccessibility of the space.

Ultimately, the final phase of the analysis, writing the report, had two distinct sections. First was the methodological insights, which provided recommendations for the research process itself and consequently developed the methodological framework. Second was the architectural insights, which highlighted the importance of both intangible and tangible factors in creating accessible environments for people with a learning disability.

Findings

This section presents the themes raised from the analysis, including methodological insights and architectural insights that encompass both intangible and tangible aspects. It also contextualises them within the existing literature.

Methodological insights

While conducting and analysing this stage, several insights regarding the accessibility of the research process itself emerged. Some of these themes echoed the methodological insights found in the previous stage, while others were novel to this stage. The insights are presented to follow a logical progression. Accordingly, this section first discusses the role of the facilitator, then personalisation, followed by informality, and concludes following the participant's lead and the prompts.

Facilitator

The added value of the facilitator was again prominent on the stage. Hamida's role in this stage was broader, especially in the preparation phase. Her role encompassed four primary responsibilities: accessibility officer, conversation facilitator, advisor, and recruiter. As an accessibility officer, she ensured all the participants' facing materials were accessible. She guaranteed that the language was simple and straightforward, the font was readable, and the pictures were meaningful. As a conversation facilitator, she would reword questions for the participants if they did not understand them or provide an example from her own experience to help them answer. Although she reviewed all the participants' facing material before commencing the interviews and ensured their

language was simple, some participants needed further explanation. As an advisor, she provided recommendations on the overall accessibility of the stage, especially when interacting with the participants. As the recruiter, she contacted the prospective participants and scheduled the interviews with them.

Additionally, her role provided a larger observation space for the researcher during data collection, as she assisted in administering the interview questions. Consequently, the researcher was able to record the participants' reactions, body language and mood changes. This would have been hard if the researcher had asked the questions solely, considering the complexity of the walking interviews, where several aspects need to be captured, as previously highlighted by the literature (King and Woodroffe 2019). Practice Note 3 will discuss further details on her role.

Personalisation

The design of the stage allowed for different personalisation venues, which proved significant in enhancing engagement. The interview dates and times were scheduled according to the participants' availability and were conducted on different dates and time slots, including weekends, providing rich insights.

Additionally, the route's flexibility allowed participants to guide the interview and take breaks as needed. Furthermore, there were no time limits or restrictions on the interviews; some lasted more than three hours. Hence, the communications were not rushed, giving the participants more control over the interviews following the literature recommendations aforementioned in Chapter 4 (Mencap 2016; Fudge Schormans et al. 2019). Furthermore, the mid-interview break location was also selected by the participants: "Take us to your favourite coffee shop" (see Figure 5-21). All these personalisation venues enhanced the participants' engagement and received positive feedback.



Figure 5-21: The centre's ground floor plan with the different locations selected for the mid-interview break. Notably, some participants chose locations totally outside the centre.

Informality

The participants enjoyed long conversations during the interview break. Although those conversations might not have been directly related to the interview topics, they helped build rapport between the researcher and participants, resulting in a substantial amount of qualitative data.

Additionally, participants enjoyed taking part in the walking interviews; many participants said, “This is fun”, and some recommended it to their friends. This reveals great potential for working with people with a learning disability across various disciplines. It also exposes that people with a learning disability have their voices marginalised most of the time, and they want to be heard.

Many participants provided lengthy, detailed examples of their preferences and the challenges they encountered. This is when building rapport became crucial; participants opened up and provided detailed examples when they felt that the conversation was personal rather than merely research-based. This was also where the facilitator’s role shone, as she reflected on her own experience, which made it more relatable to the participants.

Follow the participant's lead

The flexible interview structure allowed participants to take the lead while the researcher followed them. They indicated their favourite places around the centre and highlighted various barriers. This approach helped the participants feel more at ease and provided them with a sense of control over the data collection, which enhanced their engagement. This agrees with previous literature on interviewing people with a learning disability (Mencap 2016; Fudge Schormans et al. 2019). Consequently, this allowed covering the whole centre, which may not have been achievable with a predetermined route (see Figure 5-22).



Figure 5-22: The frequency of the different routes covered by the walking interviews

Prompts

The cue cards were used again at this stage, having proven invaluable in the previous stage. Likewise, they were equally important here, as they stimulated various conversations and assisted in overcoming memory issues, aligning with existing literature on interviewing people with a learning disability (Kindon et al. 2007; Fudge Schormans et al. 2019). Additionally, they helped overcome the formality of the data collection, making the interviews more accessible and approachable.

The environment was an additional prompt in this stage that was absent in the previous stage. However, this contradicts Mencap's recommendations for communicating with people with a learning disability, emphasising the importance of conducting interviews in a quiet, distraction-free setting (Mencap 2016). However, conducting the interviews within the building was critical in capturing the different interactions between the participants and the various architectural features (see Figure 5-23).

This was noted by existing research as an advantage of walking interviews in that it enables the researcher to access people's attitudes and knowledge about the surrounding environment (Evans and Jones 2011). Notably, the observations showed that the levels of crowds and noise varied among different interviews. Consequently, this allowed the research to capture the participants' reactions to crowds and noise.

Being in the building also allowed the participants to take the lead, as mentioned in the previous section, since this is a familiar place for them. Additionally, it helped participants overcome memory issues and encouraged them to provide examples of previous experiences within the building, as the environment itself served as a prompt. For example, some participants would follow up on previous questions when we passed by a specific feature.

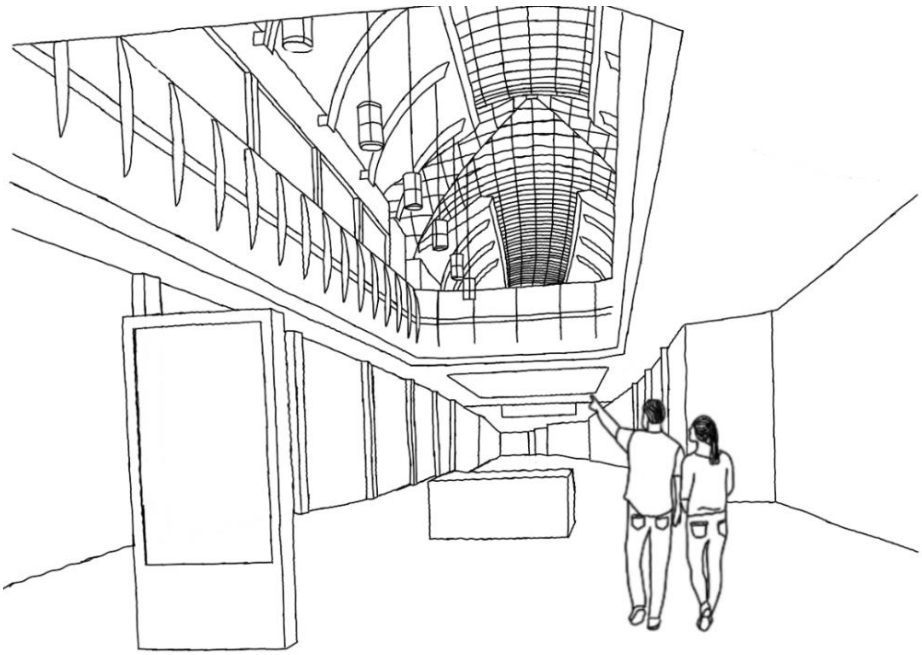


Figure 5-23: Hamida with one of the participants during the walking interviews. A frequent observation was 'participant pointing at…'

Architectural insights

The primary aim of this stage was to explore the accessibility barriers people with a learning disability face in the built environment. The walking interviews revealed insights that can be categorised into two sections: intangible and tangible. Tangible insights relate to physical and spatial features within the built environment that impede access, such as confusing signage or the absence of quiet spaces. Intangible insights refer to experiential or emotional aspects, including communication, and coping mechanisms. Additionally, the data yielded some solutions to overcome these barriers, although this was not the aim of this stage; accordingly, each theme starts with discussing the barriers, followed by the solutions.

Intangible insights

The participants highlighted several intangible barriers that may evoke stress within the built environment. Although the aim of the stage was not to explore the intangible aspects, the data showed that they can have a similar effect on accessibility as the tangible ones, which aligns with previous research on accessibility for disabled people in shopping centres (Vilnai-Yavetz et al. 2024).

Communication

Unclear communication proved to be a critical barrier to accessibility for people with a learning disability. This was evident on various occasions, encompassing both tangible and intangible aspects. The tangible aspects included unclear signs, which were also evident in the previous stage and the existing literature and will be discussed in detail later in the Wayfinding section.

Intangible aspects included inaccessible information formats. This aligns with previous literature on the accessibility of shopping centres for disabled people, where challenges in obtaining services/products were highlighted (Afacan 2012). For example, people with a learning disability may face challenges accessing key information due to limited internet access or limited use of smartphones or laptops. Even if they use these devices, information may be hard to find or inaccessible.

As a result, people with a learning disability may miss important information if it is only published online, such as changes in opening times or accessing services. For example, only one participant was aware of the hidden disability service at the centre. Richard noted, “They got a quiet room! I didn’t know that.” Notably, these services are found only on the website; there were no physical notes about them in the centre. This exacerbates the communication barrier, as it may hinder users from accessing existing services and facilities.

Furthermore, people with a learning disability may be shy or lack confidence when seeking help. When they do ask for assistance, they are likely to approach staff or security personnel rather than a random stranger. Stereotypical perceptions about learning disability may contribute to this reluctance. As Lucy noted, “I do ask, but I am a

bit shy of asking." Consequently, the lack of trained floor staff and security personnel forms a communication barrier for people with a learning disability.

Consequently, the evolution of retail architecture, characterised by a reduced reliance on staff and customer empowerment (Dubuisson-Quellier 2007), can be seen as a binomial transformation for accessibility. On one side, it empowered customers with more agency to make their own choices by providing product information on packages and blurring the space boundaries between staff and customers. This increased the independence of people with a learning disability and enhanced flexibility, which will be discussed in detail later in the Flexibility section. On the other hand, it reduced the reliance on staff, which can be critical for people with a learning disability.

Hence, a balanced staff role needs to be adopted, where staff are neither intrusive nor overly supportive of users who require further assistance. Additionally, diversifying communication techniques can support clear communication, catering to users' various needs and abilities. Disability awareness training for floor staff and security personnel is also significant.

Inclusive empathy

Inclusive empathy describes how people with a learning disability perceive accessibility. During different occasions in the interviews, participants highlighted the needs of other groups of people, for example, older people, people with visual impairment and people with physical impairment. For example, Rose noted when asked what she would change about the centre:

> *"To make it easier and accessible for learning disabilities signs, and make sure that aisles are a bit wider so wheelchair accessible, because in some there is no wide aisles."*

This holistic perspective of accessibility highlights the need to review the wide range of abilities and their challenges. Additionally, addressing these needs will consequently enhance the accessibility needs of people with a learning disability since many of them have more than one disability/condition, as mentioned earlier in the demographics. This overlap is not exclusive to learning disability; approximately 75% of disabled people experience more than one type of impairment (Sport England 2016).

Moreover, this highlights the high level of empathy and awareness among people with a learning disability. People with a learning disability face exclusion every day on multiple levels, which makes them more empathetic towards other disabled people. This stresses the importance of directly engaging disabled voices in design decisions following an empathetic approach, echoing recommendations from previous research (Gaudion et al. 2014).

Coping mechanisms

Coping mechanisms underscore the nature of the modern, inaccessible world in which people with a learning disability have developed various coping strategies to navigate its inaccessibility. During the walking interviews, participants mentioned various coping

mechanisms, and the facilitator noted that the inaccessibility of the built environment has led the learning disability community to devise different strategies to overcome architectural barriers. She added that some may not be fully aware of the accessibility issues they encounter or how these affect their daily lives, as they are used to coping with them.

For example, Richard mentioned turning his hearing aid off to avoid noise. Others planned their shopping journeys around less busy times. Notably, these slots are not necessarily the quiet hours dedicated by the centre. Others would ask for company, a friend, a family member, or a support worker. Although these strategies may appear simple, they affect the independence of people with a learning disability. This aligns with findings from previous research where Vilnai-Yavtez et al. noted that disabled shoppers are resilient out of necessity, which may lead to missed opportunities in the retail environment (Vilnai-Yavetz et al. 2024).

Activities

During the walking interviews and employment, it was noted that the learning disability community used the centre for various activities, not just shopping. Many participants liked the centre because it was lively and allowed them to leave the house. In addition to shopping, participants used the centre to:

- **Windows shopping,** as noted by Michael: “I like walking in [centre name] shopping centre. I like window shopping, seeing what they have got if I have the money to buy it.”
- **Waiting,** as Richard mentioned: “I work in the museum behind us in the archives. I check how it is before I go to work. I am wasting time, basically. I am usually early for work.”
- **Hospitality,** as Paul said:” Saturday morning, if I don’t have football, I pass by for a pastry.”
- **Shortcut** as Amelia does:” Go through the centre to go for my bus.” (see Figure 5-24)
- **Socialising**, as Lucy said:” Looking at clothes and saying hello to lots of people, my friends.”
- **Going out,** Gavin highlighted: “Because it is [the shopping centre] somewhere to come, get out of the house, just get out of the four walls, come here, I might enjoy myself in here, speak to my friends in here and then go to [area in Cardiff] and [area in Cardiff]”.

This aligns with the aforementioned literature on the evolving roles of shopping centres (Coleman 2006; Ulvi 2019). This also aligns with the LSH/Revo Survey 2024, where the top five uses for town and shopping centres among UK shoppers did not include shopping. They were hospitality, mixed tenure residential, art/culture & heritage, public realm /green spaces and lastly healthcare (Norris et al. 2024).



Figure 5-24: The ground floor plan of the centre highlighting the frequency of use as a shortcut among different participants

These various activities, coupled with free entry and extended opening hours, have made the centre part of the participants' weekly or even daily routine, which exacerbates the need to ensure its accessibility. Furthermore, most participants do not prefer online shopping, either due to a lack of internet access or the complicated nature of the process, which makes physical shopping their preferred method. Therefore, transforming shopping spaces to be more inclusive would directly enhance their daily lives, empowering them and increasing their independence.

Tangible insights

Some of the barriers found in this stage echoed the findings of the previous stage and the existing literature. While others represent novel findings at this stage. The insights are presented from general perceptions, including: familiarity, wayfinding, sensory overload, flexibility and safety, to specific design elements, including: recovery spaces and facilities, concluding with entrances.

Familiarity

Echoing the findings of the previous stage, familiarity played a role in the perception of accessibility for people with a learning disability. People with a learning disability often find comfort in familiar contexts. As Richard noted:

> *"... it is easy I know where everything is. I have got a past experience; if I go to [another centre name], then no, I wouldn't know where anything is; I know this one because I live here."*

It was also noted that familiarity did not only refer to a specific building but had many facets. It can be as simple as familiar symbols in signs. For example, people with a learning disability understand the universal toilet symbol, but they may struggle to understand other stylised symbols (see Figure 5-25). Another example is coffee shops; people with a learning disability usually prefer coffee shop brands they are familiar with because they know what to expect when they enter, not only food and drinks, but also the layout and the colours of the space.

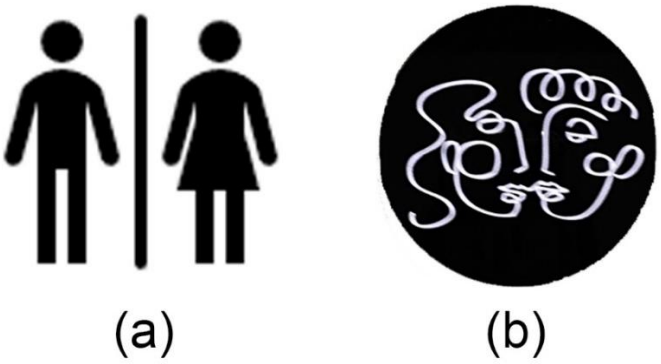


Figure 5-25: a) the universal toilet signs, which are more understandable for people with a learning disability; b) an example of toilet signs that may not be understandable for people with a learning disability

Another example noted was the familiarity with the shop's setting. Typically, stores rearrange their merchandise to make it more visible and encourage customers to make purchases. As Sophia pointed out, “They keep changing it. When I get used to it, they change it. They change it so much.” This can be confusing for people with a learning disability because it means they need to ask staff, which not all of them are confident about, as mentioned in the Communication section. Consequently, they might continue walking until they find what they are looking for or give up and leave.

As a result, being unfamiliar with the layout, product placement, symbols, brands, or technology can cause stress. Unpredictable changes, including adjustments in product locations, layout, new technology, and seasonal variations, can contribute to stress and potentially lead to trip abandonment.

When asked about their favourite shop, rest space, department store, and coffee shop/restaurant, there was no specific shop that all the participants liked. Each had a favourite place based on their preferences, although they may note inaccessibility features in this place. For example, while inside her favourite department store, Sophia highlighted: “Very bright, and glare and the ceiling is low here.”

These findings shed light on several points. First, familiarity plays a role in the perception of accessibility, even with the existence of inaccessible features. Second, people with a learning disability are used to an inaccessible built environment that they use various coping mechanisms frequently, as mentioned earlier to overcome inaccessibility. Third, there is no specific design or prototype that needs to be followed to be inclusive for people with a learning disability (see Figure 5-26). Some had a

particular favourite shop or coffee shop for non-architectural reasons; they liked its coffee or received discounts there. Consequently, this has the potential for creative, accessible design solutions, contradicting the current approach to accessibility as a hindrance to creativity, which aligns with Boys and Kajita (2023).



Figure 5-26: The participants' favourite shops and department stores, noting that some shops were chosen more than once

During the interviews and employment, participants mentioned several solutions to overcome the lack of familiarity. This includes minimising changes as much as possible. When changes cannot be avoided, they must be communicated clearly through various modes, as previously mentioned in the Communication section. Additionally, trained floor staff can help address the lack of familiarity through signposting, which enhances

their significance. Moreover, it is recommended to use international symbols in signs to increase familiarity, which will be discussed in the Wayfinding section below.

Wayfinding

Chapter 2 highlighted wayfinding and navigation as a critical accessibility barrier for people with a learning disability (Salmi 2007; Castell 2008), which was echoed in the first research stage. Additionally, the aforementioned literature on shopping centre design principles highlighted accessibility as a vital principle, as well as disabled people highlighting circulation and wayfinding as a challenge (Afacan 2012; Vilnai-Yavetz et al. 2024).

Accessible wayfinding is vital for people with a learning disability as it increases their sense of independence. It is essential for reaching the destination and for accessing important facilities and services. Complex layouts can lead to frustration and stress, as previously mentioned in Chapter 2. This is compounded by the fact that some people with a learning disability may be reluctant to ask for directions, as evident in the wayfinding activities. Hence, if they get lost, they may just keep walking, which increases stress and anxiety.

Additionally, one obvious observation of the centre is that it lacks landmarks. Consequently, it was clear through most of the interviews that the participants would use their favourite or familiar stores or escalators as landmarks to give directions or as signposting points to reach locations during the activities. This stressed the importance of landmarks, as wayfinding can be much more difficult for people with a learning disability without prompts such as landmarks (Salmi 2007; Castell 2012). Additionally, landmarks were recommended in the design of shopping centres, as mentioned in the identifiability principle.

In addition to landmarks, signs are another integral part of the wayfinding process. A lack of signs or unclear signs can be confusing and misleading, leading users to abandon their attempt to reach their destination. During the interviews, participants repeatedly highlighted the lack of and inaccessibility of signs in the centre. As Daniel noted: “As I walk in [the centre name], there is no sign in saying toilets or if they are, I find them small. As a whole, it is not easy to find the toilets anywhere.”

During the wayfinding activities, it became apparent that the participants' navigation abilities varied significantly, including reading maps, interpreting signs, converting two-dimensional information into three dimensions, and recalling navigation instructions. It was also clear that the participants employed various strategies to reach their destination; some utilised the interactive maps, asked random individuals for help, and consulted floor staff or security personnel, while others simply continued walking in hopes of finding their destination.

Consequently, this requires a wayfinding system that integrates multiple cues to accommodate diverse abilities and needs. Signs are an integral part of that system. Participants highlighted different features for accessible signs, including being

supported by photos or symbols, written without jargon, distinguishable, clear, and featuring larger fonts and bigger signs at eye level. For example, Jessica pointed out an inaccessible sign and described its lack of clarity (see Figure 5-27):

> *"It is not easy to see. Maybe if they had it on a stick or something coming out from the ground. It is similar to the shop over there; it could be a random sign. It is hard to read also, it could be a shop sign because of all the colours on it looks like an advert or a poster or something, I didn't even know what is that when I come in."*



Figure 5-27: An example of an inaccessible sign (lengthy explanation, bad lighting, hard to distinguish from the background, above eye level)

In addition to clear signs, trained floor staff can help signpost users, as mentioned earlier in the communication section.

Sensory overload

Sensory overload can be stressful for people with a learning disability. Lighting, noise, and touch were the most significant of the sensory elements. Notably, only one participant mentioned smell as a trigger.

Regarding light, participants showed a clear preference towards natural lighting. For example, when asked about the lights, Sophia noted, "It is nice" while pointing at a skylight in the centre (see Figure 5-28). On the other hand, participants expressed distress about artificial lighting. Jessica noted, "I don't like sometimes the bright lights on the shop titles. See that one there in the perfume shop." She also pointed out a wall with reflections from an opposite shop, which she highlighted as a sensory stressor (see Figure 5-29).



Figure 5-28: One of the skylights in the centre gained positive feedback from the participants



Figure 5-29: The column material created reflections, which exacerbated the stress caused by artificial lighting

Participants preferred colourful and decorated environments over minimalistic settings. As Amelia noted when asked about colours: “A bit bland, I think it could be more colourful.” However, the use of colours and patterns should be approached with care, as intricate patterns can be overwhelming. During the interview break, participants tended to avoid facing complex patterns; Patrick sat with his back to one such design. As this had been a consistent observation among other participants, the researcher inquired about it. Patrick responded, “I do not like it.”(see Figure 5-30).

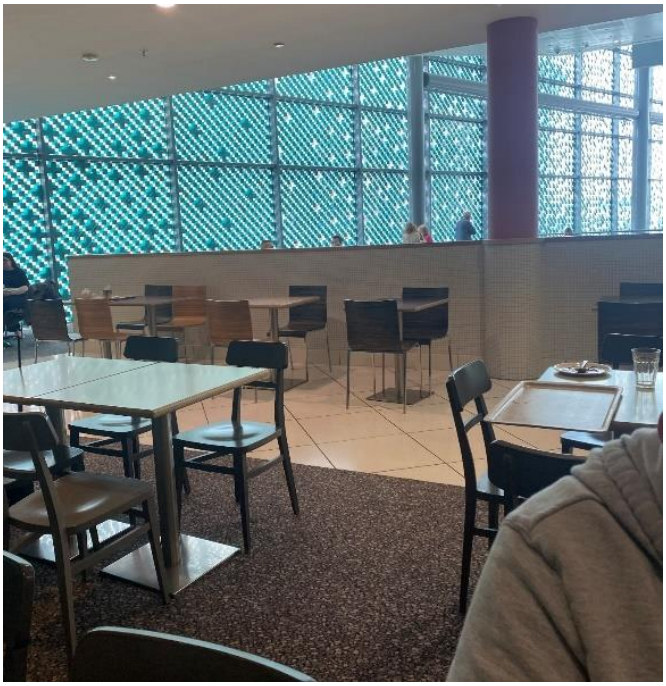


Figure 5-30: Patrick sat with his back to a complicated pattern, an observation repeated with other participants

The participants highlighted their sensitivity towards noise and touch through crowds. Crowds can be stressful for people with a learning disability; they might be overwhelming, which may lead them to leave. This aligns with the challenges mentioned by disabled people in shopping centres (Vilnai-Yavetz et al. 2024).

Additionally, crowds exacerbate claustrophobic feelings as they may invade personal spaces. As Amelia noted, “I don’t like when it is crowded, no, and people walk into me.”

Consequently, people with a learning disability showed a preference for open spaces so they do not feel confined. This was expressed on different occasions, for example, in preference for coffee shops with outdoor spaces and using outdoor spaces to recover from the sensory overload. Sam noted:

> *“I can cut through the [shopping street in Cardiff] if there is too many people, to avoid people… because the [shopping street in Cardiff] there is not too many people, if the [area in Cardiff] is busy I normally go through the [shopping street in Cardiff] to go from one place to another.”*

Various design solutions were mentioned during the walking interviews and employment to mitigate the negative impacts of sensory overload. For example, the utilisation of quieter places will be discussed in detail in the Recovery Space section. Equally important is clearly announcing/signposting these spaces, as mentioned in the Communication section. Additionally, relying on natural lighting and integrating outdoor spaces is recommended where possible. Which aligns with the contemporary trends in designing shopping centres. Where there is an inclination towards shopping in natural settings with abundant daylight to create an illusion of open environments (Coleman 2006; Erdogan et al. 2023), which also echoes the recommendation of designing accessible shopping centres for disabled people (Vilnai-Yavetz et al. 2024)

Flexibility

The varied abilities of the participants called for options and flexibility, which was a clear observation during both the walking interviews and employment (see Practice Note 1). The participants appreciated having a range of options. This included both intangible and tangible aspects. Grace noted: “I think they [people with a learning disability] would like the choice out of different things because it is good to have two choices rather than no choices.”

An intangible example is the payment method during shopping. The tangible aspects included vertical accessibility; it was noted that participants used different vertical connections in the centre, and some used more than one (see Figure 5-31). For example, Jessica highlighted, “I don’t like the escalators coming down; I only like the escalators going up.” Options can also be provided in recovery spaces, as participants highlighted a range of options for them, which will be discussed in detail later in the Recovery Spaces section. Implementing various options in the design enhances accessibility and consequently raises a sense of independence for people with a learning disability.



Figure 5-31: The frequency of different vertical connections used during the walking interviews by the participants

Safety

Participants mentioned safety on different occasions; they noted that a lack of safety can lead to stress or stop them from visiting the centre altogether. Lack of safety included stranger danger, lack of first aid or paramedics, slippery floors and cyclists outside the centre. As Jessica noted:

> *"... one downside of [shopping street in Cardiff] it can get crowded sometime and get a bit random sometimes with arguments as well as people being ill, and it is not close for a paramedic."*

The availability of floor staff and security personnel, in addition to the accessibility to first aid, is critical to increasing feelings of safety. Additionally, the revision of safe materials, such as non-slippery floors, is imperative, as Michael noted: "This floor can be a little bit slippery." Which was a design recommendation in the previous literature aforementioned (Ulvi 2019).

Recovery spaces

People with a learning disability may experience distress from crowds or sensory overload. As Amelia highlighted: "Normally if it is Saturday night, I won't last more than 10 mins before I am trying to find a quieter area. I don't like places that get louder and noisy". Lack of recovery spaces may result in elevated stress, anxiety and may lead to abandoning the task. This can be exacerbated by a lack of communication regarding access to the recovery space, leading the user to be unsure of where to go for a break.

Hence, designated spaces for taking a break, reaching out to a trusted person, or regaining composure were a prominent need during the walking interviews. This aligns with the previous recommendations for accessible shopping centres for disabled people (Vilnai-Yavetz et al. 2024). Participants noted several features of a recovery space, including being calm, having access to food or drink, being spacious, private, and well-managed, having natural lighting, connections to the outdoors, and proximity to toilets.

Notably, the participants highlighted various forms of recovery spaces, including quiet rooms, quiet corners, outdoor areas, sensory rooms, seats, and restaurants or coffee shops. As Michael noted: "If I find a chair I will just sit down, if it is a nice day I will go outside." These options underscore the importance of flexibility and options, as discussed in the flexibility section. This inclination towards open spaces coincidentally aligns with the modern direction to design shopping centres into semi-open structures, incorporating outdoor spaces (Erdogan et al. 2023) aforementioned in the literature, in addition to recommendations on accessible shopping centres for disabled people (Vilnai-Yavetz et al. 2024).

Facilities

Participants expressed a need for specific facilities during their shopping experiences. Various facilities play a crucial role in enhancing the shopping and leisure experience of people with a learning disability. This aligns with previous literature on the accessibility

of shopping centres for disabled people, where public amenities have been emphasised (Afacan 2012).

For example, Daisy highlighted that she prefers to shop in a place with toilets: "... I like [a closed shopping street in Cardiff] more because it has toilets". The centre had four toilet locations. However, the participants only used three of them, excluding the one on the lower floor (see Figure 5-32), which can be attributed to the lack of footfall on the lower floor in general (see Figure 5-22) and the location of the favourite shops and department stores (see Figure 5-26).



Figure 5-32: The frequency of toilets known to the participants in the centre. Notably, some participants mentioned toilets outside the centre or within specific shops inside the centre

Other facilities mentioned by the participants included information desks, restaurants, coffee shops, and seats. Lack of facilities can elevate stress and anxiety. For example, Sophia answered the following when asked about what she would change in the centre: “More benches to sit down. They used to be, but now, you need to sit down to put your money and put everything away.”

Consequently, various facilities should be provided around the centre, ensuring their location is as central as possible. Additionally, they should be adequately communicated about, as mentioned in the Communication section. Michael noted, “I will tell you what they need to do [the facilitator's name], put signs up to show you where the toilets are because there are no signs to tell you where they are.”

Entrances

The results of this research stage showed that entrances can be problematic, which was also noted in the previous stage, and aligns with previous research (Afacan 2012). Participants noted that entrances can be inaccessible, especially with crowds. To overcome this, the participants suggested separating entrances and exits and labelling them to ease crowds around the entrances. Michael suggested, " What they should have here is a way in, a way out, because that same path is not really acceptable.”

Conclusion

This chapter presented the second research stage, Exploring, using walking interviews. It aimed to explore the accessibility challenges faced by people with a learning disability in the Cardiff Metropolitan Shopping Centre. The chapter presented both methodological and architectural insights that informed the development of the study’s two main outputs: the methodological framework and the set of architectural insights.

The methodological insights gained from this stage reinforced the significance of collaboration with the facilitator and the use of an adaptable, accessible interview structure, such as cue cards and participant-led routes. This flexibility enhanced participant engagement and allowed for a deeper understanding of how various design features impact accessibility. While the architectural insights emphasised the critical need for inclusive design features, encompassing both intangible and tangible elements, such as clear signage, strategically located rest areas, and minimised sensory overload. Tackling these barriers is essential for creating more inclusive public spaces that address the needs of people with a learning disability. These findings directly informed the next research stage, which focused on confirming the identified barriers through focus groups.

PRACTICE NOTE 2: BEYOND RESEARCH

In this practice note I reflect on three key dissemination activities conducted outside the academic research setting. These activities aimed to translate the academic findings into practical recommendations for improving the built environment for people with a learning disability. Each involved engagement with industry or policymakers to promote more inclusive design thinking, including conducting inclusive workshops with a national retailer, producing a guide for accessible retail spaces, and contributing to the revision of accessibility standards with the British Standards Institution (BSI).

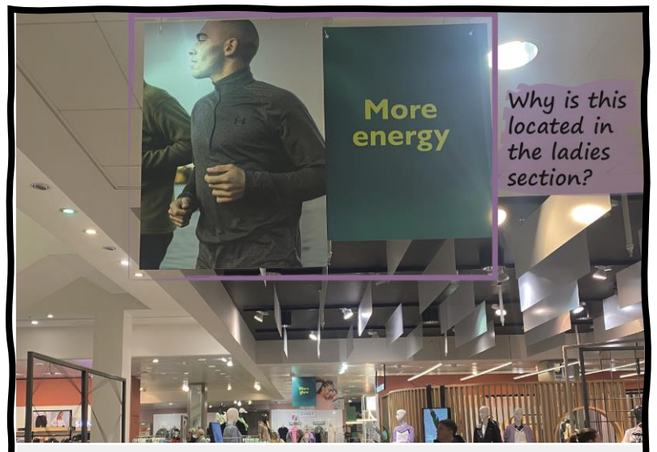
Inclusive Workshops with a National Retailer

After presenting my research findings at a disability research group meeting, I was approached by a concept designer from a major national retailer who invited me to participate as a guest speaker in their inclusion strategy workshops. These workshops were part of an ongoing project aimed at enhancing the inclusivity of their stores as part of a broader upgrade plan. This opportunity allowed me to share my research findings directly with industry professionals and offer tailored recommendations based on real-world insights.

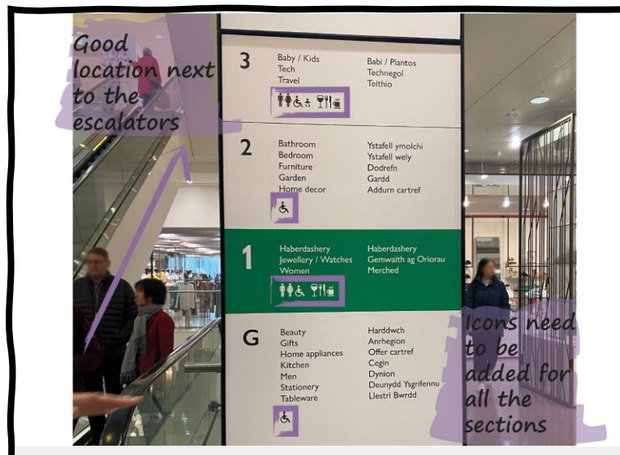
To ensure that my recommendations were specific and actionable, I visited one of their local stores alongside Hamida before the workshops. During this visit, I recorded her initial impressions of the store layout and design. She was not a frequent visitor to this store, which offered a fresh perspective on its accessibility. Her comments highlighted several key issues, including the confusing signage and the overwhelming lighting in certain sections of the store, which could make navigation difficult for people with a learning disability. She also highlighted good practices, such as material compartmentalisation and directories located next to the escalators. The following figure is a visual representation of her perspective of the store.



For some people with a learning disability, the arrow "up" means upstairs, whereas in this case, it meant straight ahead



The location of this sign, among similar ones around the store, caused confusion for Hamida. It includes a male jogging in sportswear with the sentence “more energy”. Hence, Hamida thought this was the men’s sports section, but it was the ladies' section



Hamida highlighted that having a sign like this next to the lifts and escalators is beneficial, however, it needs more icons. For example, we can see icons for toilets, accessible toilets, food and coffee; it would be great to add those icons for all the words. Which reflects Easy-Read principles



This material distinction left a positive impression as it separated the show area and the circulation area



The lighting section was noted as overwhelming, with all these products and fixtures lit up simultaneously

First workshop

The first workshop brought together a diverse group of professionals from various levels, including delivery roles and directors, as well as store designers and planners, compliance specialists, graphic designers, architects, and marketing managers, all focused on improving the inclusivity of the retailer's spaces. The session featured three guest speakers, including academics and disability research charities, each addressing different aspects of disability. In my presentation, I shared the initial impressions gathered from Hamida's visit, along with an overview of learning disability in the UK and the principles of inclusive design. I then delved into a detailed discussion of the architectural barriers faced by people with a learning disability in retail environments, providing insights from the walking interviews.

Furthermore, I highlighted the overlaps between the barriers faced by people with a learning disability and those encountered by other groups with different disabilities or characteristics. This was a key part of the discussion as it demonstrated how inclusive design could address the needs of multiple groups simultaneously, thereby enhancing the overall accessibility of the space and increasing profitability equally.

Second workshop

The second workshop adopted a more hands-on approach, with guest speakers serving as consultants to provide feedback on the inclusion strategies developed by various store teams based on the discussions from the first workshop. The participants were divided into three groups, each tasked with activities such as mind mapping and customer journey mapping, where they explored different scenarios related to disability inclusion.

After the group sessions, each team presented its findings to the entire group, and the key overlapping themes were identified and mapped out. This process allowed us to identify recurring challenges and opportunities for improving accessibility. The collaborative nature of this session helped ensure that the proposed solutions were both practical and grounded in real-world scenarios.

Third workshop

The third workshop took place at a partner brand's headquarters, involving a new team, marking a shift in focus. It was part of a Team Day attended by store designers, construction project managers, architects, and commercial managers. Similar to the earlier workshops, the session featured three guest speakers, each covering a different type of disability or specific need. What set this workshop apart, however, was that each presentation included an interactive activity designed to engage the team directly.

In my presentation, I addressed the specific barriers that people with a learning disability face in retail environments and facilitated a discussion in which the team suggested potential solutions to overcome these challenges. This more interactive format allowed the team to engage deeply with the issues at hand, generating a wide

range of ideas for creating more inclusive retail spaces and evoking critical discussions on cost and profitability.

The organiser of these workshops provided the following feedback on their impact:

“Menna has been a vital part of a drive to improve the understanding of how to improve inclusion of the disabled community in our stores. Her influence has seen her present to both small and large groups of people, informing our store design team and broader marketing and implementation functions. Her delivery and ways of working have guaranteed her return work with us - she has been consistently professional and friendly, presenting engaging material with important insight, delivered with warmth and humour.

Since the workshops and following Menna's involvement, inclusive design - including the needs of the learning disability community - have become more at the front of our designers minds, and spoken about and acted on during the concept design process. Significantly, the business has now employed an inclusive design expert to sit on its governance and compliance group, to ensure all design, marketing and other interventions have been developed and delivered with inclusion of the disabled community in mind.

The business now has ambitions to develop inclusive design guidelines to formalise the learnings from Menna. In particular, we are seeking to embed the over-lapping themes that would improve the inclusion of older, disabled and neurodivergent people - insight that Menna directly suggested and has worked with us to develop. Currently, 'inclusive design' is viewed in the business through the lens of targeting the needs of individual disability groups e.g. sensory loss, wheelchair users, autistic people. These groups are primarily selected because they either receive more attention in UK Building Regulations or are spoken about more in the media. Since Menna's involvement, we now understand that looking at the broader needs and over-lapping requirements of a variety of groups increases inclusion more effectively and efficiently. We are looking forward to working with her in the future and greatly value her academic expertise, creativity and approachable collaboration.”

Guide for Accessible Retail Spaces

The second activity stemmed from my efforts to engage more closely with retailers in Cardiff and share the findings from the walking interviews. The organisation and I aimed to collaborate with local businesses, and to turn this initiative into reality, we needed funding. To secure the necessary resources, we applied for the "FOR Cardiff City Ambition Fund" (Cotterill 2021), with me serving as the lead applicant. The fund spanned four months and had a budget of £2,000, which covered expenses for consulting, graphic design, and publicity efforts.

Developing the guide was an iterative process that involved several rounds of feedback from the learning disability community. This consultation included input on colour schemes, graphic design choices, and accessibility features, such as clear and easy-to-read fonts and the use of accessible language. Each round of revisions ensured that the guide accurately represented the voices and experiences of people with a learning disability. By incorporating this feedback, we created a guide that was both visually engaging and practical for retail managers and designers to use.

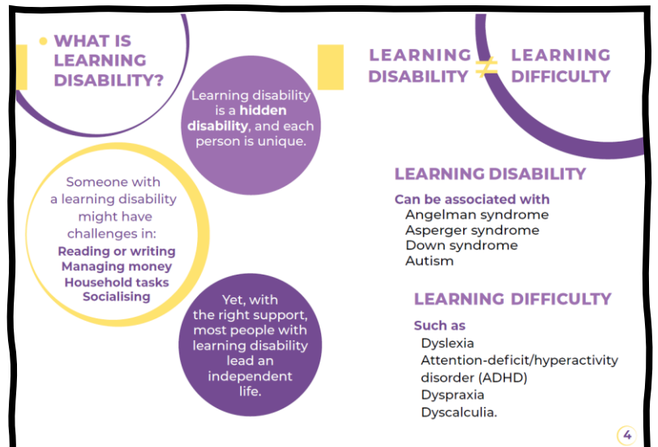
The guide was designed to be both informative and practical. It began with an introduction to learning disability. It then outlined the various barriers that people with a learning disability face in retail spaces, explaining each one in detail and proposing potential solutions. The guide concluded with a set of key recommendations categorised from minimum considerations to optimum scenarios to help retail owners and managers in their inclusive pursuits. Additionally, it provided further resources to support retailers in making their spaces more accessible.

Once finalised, the guide was primarily disseminated through the funder's website and newsletter, reaching over 6,000 contacts within Cardiff City Centre. Additionally, it was shared with the organisation's networks, further expanding its reach. The guide's electronic distribution enabled easy access and sharing by a wide range of stakeholders, helping to raise awareness about the importance of accessibility in retail spaces.

The diagram below offers a visual overview of the guide's structure and content, summarised for this PhD thesis. The full version, titled "Unified Paths: Supporting Inclusive Business Practices," can be accessed via the FOR Cardiff website (Kasem and Kaleem 2024).



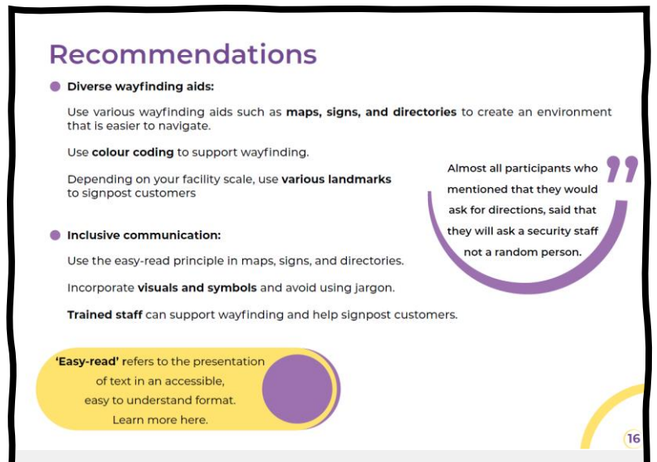
The guide included different challanges that face people with learning disability in the built environment



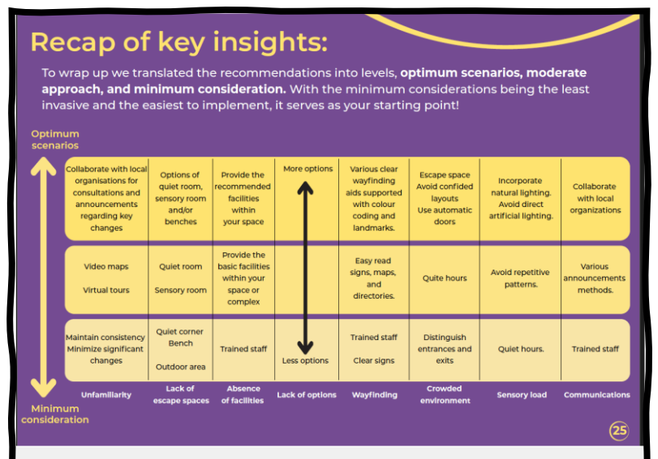
The guide started with a simple introduction about learning disability



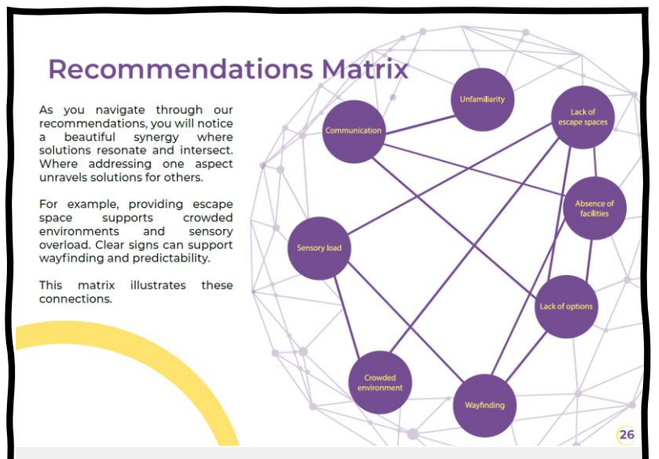
Each challange included a brief description, a quote and an image



Each challange were followed by recommendations, supported by quotes and some included links for further readings



The key insights presented the recommendations on a scale from minimum to optimum to help retail owners/managers plan their implmentaions



It concluded with the concept of overlaps between the different themes

Engagement with the British Standards Institute

The final activity involves participation in the drafting panel for the forthcoming revision of BS8300-1:2018 and BS8300-2:2018, which focus on the design of accessible and inclusive built environments (The British Standards Institution 2018; The British Standards Institution 2024). This collaboration will include working alongside a diverse group of inclusive design experts and will extend 12 to 18 months, extending beyond the completion of my research.

The primary objective of the revised standards is to better reflect the needs of all protected characteristic groups and incorporate the recommendations of PAS 6463: Design for the Mind (The British Standards Institution 2022). This represents a significant step forward in the industry, as no previous guidance exists. There is a growing demand for such guidance, fuelled in part by the increased focus on equality and diversity in recent years, as well as the introduction of the Equality Act 2010 and the RIBA Inclusive Design Overlay to the RIBA Plan of Work (Royal Institute of British Architects 2023).

In Chapter 2, I noted that the shift in the architecture industry's perspective on inclusive design can be facilitated through two main strategies: regulation (coercion) and education (persuasion). Although the BSI guidelines are not mandatory and do not guarantee systemic change, they are a crucial step towards creating more inclusive environments. My contribution to this panel is an opportunity to translate the insights and findings of this research into national design guidance, with a particular focus on representing the lived experiences of people with a learning disability, an area that has been largely absent in previous iterations of the standard. While it is premature to claim concrete outcomes or impact, my goal is to ensure that the needs of this community are reflected in the revised guidelines.

Conclusion

These interactions support my belief that research on inclusive design should be rooted in real-world applications. Engaging with industry stakeholders highlighted the importance of translating academic work into practical recommendations that can inform design practices and enhance accessibility. The experiences I gained through these interactions provided insights into communicating research to non-academic audiences. These experiences helped me understand how to bridge the gap between research and practice effectively. Ultimately, they emphasise the need for ongoing dialogue among academia, industry, and communities to mainstream inclusive design.

6. SYNTHESISING

This chapter presents the third stage of the research, Synthesising, which aimed to validate the barriers identified in previous stages in preparation for the last stage, Co-design.

Introduction

The preceding chapter examined the second research stage, Exploring, which utilised walking interviews to identify barriers people with a learning disability face in the built environment, concluding with Methodological and architectural insights. In continuation, this chapter examines the third research stage, which aimed to validate and synthesise the architectural insights identified in the previous chapters.

The chapter follows the same structure as the previous fieldwork chapters, including four sections: preparation, data collection, analysis and findings (see Figure 6-1). The preparation includes a review of the literature on best practices for conducting focus groups with people with a learning disability. Then, the focus group structure was designed and reviewed through consultations, followed by the ethical application for both stages 3 and 4. Following that, the data collection was conducted and then analysed using reflexive thematic analysis to identify key themes. Ultimately, the findings were corroborated through consultations with the facilitator, ensuring the credibility of the results. The corroborated findings from the focus groups informed the final research stage, Co-design.

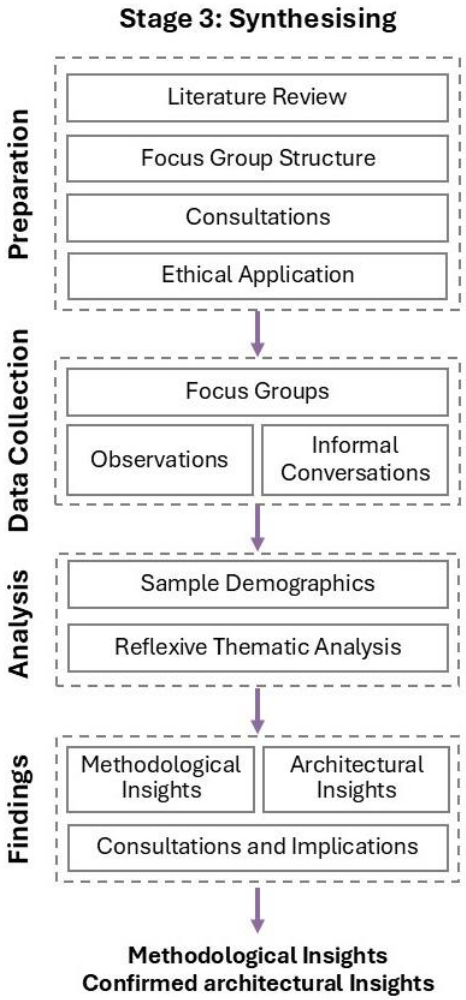


Figure 6-1: The chapter structure encompassing four sections

Preparation

The preparation commenced with a review of the literature to identify best practices for conducting focus groups with people with a learning disability. After reviewing the literature, the structure of the focus group was designed and subsequently reviewed by the facilitator to ensure that the process would be inclusive and accessible. The final section of the preparation addresses the ethical application process undertaken before the commencement of data collection.

Conducting focus groups with people with a learning disability

In addition to the guidelines on conducting interviews with people with a learning disability presented in Chapter 4, additional guidance is provided here regarding the conduct of focus groups with people with a learning disability. Considering the numbers, Mencap suggested having fewer participants per session or employing more than one moderator to enhance engagement and foster a more personal connection among participants (Mencap 2016). Consequently, the stage design consisted of three focus groups, with participants ranging from three to five, and two facilitators, the researcher and Hamida.

Regarding facilitators, previous research recommended that the researchers need to be introduced to the participants before the research, so they are not seen as an authoritative figure (Fraser and Fraser 2001), which was achieved through employment experience described in Practice Note 1. Additionally, facilitators need to be flexible and adaptable when conducting focus groups with people with a learning disability, for example, taking breaks (Gates and Waight 2007). Flexibility was adopted during the walking interviews and proved to be a valuable methodological insight; thus, it was reutilised during the focus groups.

For the focus group design and structure, it is recommended that participants sit around a table to provide focus and purpose to the group while also allowing participants to move freely (Gates and Waight 2007). Additionally, the focus groups should engage the participants in a variety of activities in addition to discussions tailored to their abilities (Gates and Waight 2007; Gary et al. 2012). Consequently, participants sat around a table during the focus groups and activities were utilised.

Lastly, when engaging carers, some researchers caution against the risk of relying heavily and uncritically on the input of support staff who speak on behalf of disabled people, as this might overshadow the voices of people with a learning disability. However, others emphasise the importance of including their voices in the design process (Gaudion et al. 2015; Sitbon and Farhin 2017). To balance this, support staff, carers, and family members were allowed to participate only in stages 3 and 4, unlike the previous fieldwork stages, while prioritising the participants' voices.

Focus group structure

The focus groups aimed to verify and synthesise the architectural insights raised in the previous stages, to inform the agenda of the co-design workshops. It aimed to answer the following questions:

- What barriers do people with a learning disability face in shopping centres?
- How do different architectural elements affect the experiences of people with a learning disability?

The agenda included the themes that emerged previously from the walking interviews to verify them (see Table 6-1). As it primarily aimed to verify the tangible, the intangible insights were not included in the agenda. The agenda was 170 minutes long, with each topic allocated 15 minutes for discussion, in addition to two breaks.

Table 6-1: The agenda of the focus groups

Duration	Topics	Tools
15 minutes	Introduction (workshop rules, project information sheet and consent)	Photo aid/ verbal admission
15 minutes	Discussing Familiarity	Photo aid/ verbal admission/ voting

	• If you are familiar with a place, will that make it more accessible to you?
	• Can you tell us how?
	• If you are going to a new place, what might help with familiarity?
	• What does familiarity mean to you in a shopping centre? (voting task)
	  ○ Familiar signs
	  ○ Familiar toilet locations
	  ○ Familiar stores/shops
	  ○ Familiar brands
	  ○ Familiar merchandise locations in the shop
	  ○ Familiar shop/store design (for example, colours)
	  ○ Familiar Staff
	  ○ Other	

15 minutes	Discussing escape spaces	Photo aid/ verbal admission
	• Do you need an escape space/quiet room/ sensory room in a shopping centre? Why? • If there is no space for a room, is there an alternative?	
15 minutes	Comfort break	

Table 6-1 (continued)

Duration	Topics	Tools
15 minutes	Discussing centre facilities	Photo aid/ verbal admission/ voting

	• Vote for the facilities you need in a shopping centre to make it more accessible to you.
	  ○ Toilets
	  ○ Seats
	  ○ Restaurants and café
	  ○ Escape spaces/quiet rooms
	  ○ Maps
	  ○ Security staff
	  ○ Security cameras
	  ○ Safe materials (non-slippery floors)
	  ○ Staff
	  ○ Other....
	• Does having different options in the shopping centre make it more accessible to you? For example: escalators, elevators and stairs?
	• What are other facilities options you think you need?	

15 minutes	Discussing wayfinding	Photo aid/ verbal admission
	• Do you use signs to help you get around the centre? • How important are signs in supporting your wayfinding? • What else would use to help you get around the centre?	
30 minutes	Lunch Break	
15 minutes	Discussing space design	Photo aid/ verbal admission
	• Do you prefer open and double-height places? Why? • How do you feel about crowds? • What is your coping mechanism with crowds? • How can an entrance be accessible? • What is an example of a good entrance?	
15 minutes	Discussing user preferences	Photo aid/ verbal admission
	• Do you prefer natural lighting? Why? • Does artificial lighting stress you? Why? • Do you prefer vivid colours more than neutral colours? Why? • Do you prefer decorative elements in the space? Why?	

Table 6-1 (continued)

Duration	Topics	Tools
10 minutes	Voting	verbal admission/ voting
10 minutes	Wrapping up (introducing the co-design workshops, signing up for the co-design workshops)	Photo aid/ verbal admission

Being present in the relevant environment proved to be a significant asset during the previous stage, as it provided a valuable prompt for many participants and elicited numerous insightful comments. However, since the workshops could not be held at the shopping centre, considering the number of participants, distractions, lack of appropriate space and valuing the participants' privacy, this was compensated by using photos from the centre in the focus group presentation (see Figure 6-2). Another prompt utilised in this stage was voting, based on the facilitator's recommendation, employment experience and previous research (Gary et al. 2012). Voting was utilised three times in the focus groups to enhance engagement (see Table 6-1).



Figure 6-2: The focus group presentation was aided by photos of the shopping centre

Following the same approach as the previous research stages, the project information sheet and consent form were prepared in Easy-Read format, primarily for the participants' records. However, the participant information sheet was not prepared in a video format, as both the consent and the participant information sheet were admitted verbally as part of the focus group presentation. In addition, an introductory question sheet was also prepared in Easy-Read format to collect general information about the participants and ensure their eligibility before the start of the discussion (see Figure 6-3).

Hello my name is	Name
	Age
	Are you man/woman/other?
	Do you have a learning disability? If yes, do you know what it is? If no what is your relationship with learning disability
CARDIFF CAERDYDD	Do you live in Cardiff? If the answer is no, do you visit Cardiff?

Figure 6-3: Introductory and eligibility questions form

Consultations

The facilitator reviewed the agenda and format of the focus group, as well as the presentation and the eligibility question form. Changes were made, including increasing the break time. Additionally, some pictures in the presentation were changed to be more representative.

Since the location of the focus groups was new to many participants, the facilitator suggested a meeting-up location in a familiar area, where she met the participants and guided them to the venue.

Ethical application

After addressing the comments from the consultations, the ethical application for both the focus groups and workshops was submitted to The Welsh School of Architecture's Research Ethics Committee, and approval was acquired (SREC), reference 23048 (see Appendix 5, p. 293).

Data Collection

The focus groups were held in three consecutive sessions, which were within the recommended range noted by Braun and Clarke for medium projects and studies in large projects (Braun and Clarke 2013). The focus groups were held at the host school

on three different days, including one on a weekend, to accommodate the varying schedules of participants.

Recruitment followed the same procedure as the walking interviews. The facilitator contacted potential participants and provided them with various session options to choose from. The eligibility criteria for participation followed the same procedure as those in the previous research stages. The participants needed to be over 18, have a learning disability, and live in Cardiff or visit Cardiff regularly.

Each focus group consisted of three to five participants and two moderators, all of whom were employees at the organisation that recruited the participants, following the aforementioned literature. This ensured the participants' familiarity with the moderators, allowing for deeper discussions and interactions. This was also enhanced by the fact that all the participants were members of the same organisation, making them familiar with each other. The participants sat around a table, following the aforementioned literature, while the moderators were mostly standing, and the supporter sat on the side (see Figure 6-4).

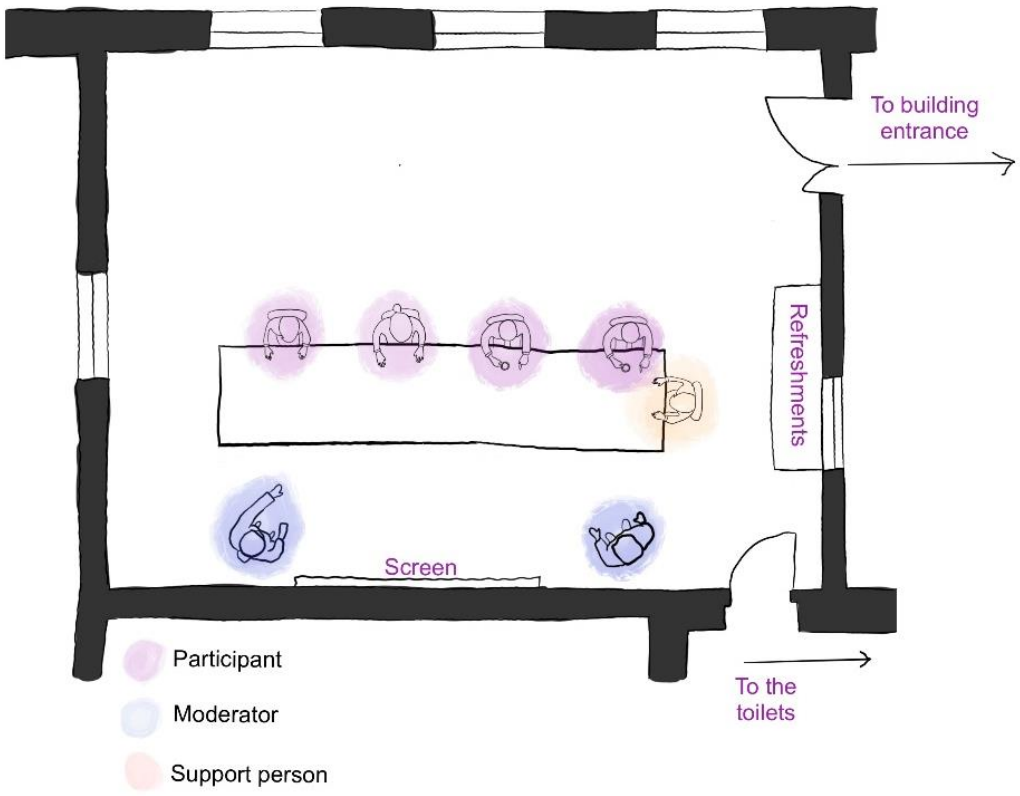


Figure 6-4: The focus group layout

Before starting the session, the focus group rules and agenda in Easy-Read format were printed out in large font and pinned up in the room for ongoing signposting (see Figure 6-5). Each focus group began by reading the rules and project information, signing the consent form, and completing the introductory form. All the focus groups were audio recorded using the university's recording software, Panopto, which was then directly uploaded and transcribed to the university's secure cloud.



Figure 6-5: Focus group rules and agenda which were pinned out before the start of each focus group

To ensure that each participant had the opportunity to discuss the topic at hand, the participants took turns answering the questions. The questions were repeated for each participant to remind them, particularly since some took longer to respond or reflect on various topics. Questions were rephrased if the participant did not comprehend the original inquiry, and the facilitator might follow up with a personal example to clarify the point. Answers were also reiterated to guarantee correct interpretation. Follow-up questions were incorporated based on participants' reflections and discussions. Participants engaged in conversations about different subjects with one another and reflected on each other's answers.

Analysis

The analysis for this stage followed the same approach as the previous stages. After transcribing the focus groups and sorting and categorising the informal conversations, observations, notes, and photos, demographics were first analysed before delving into the reflexive thematic analysis.

Sample demographics

Demographic data were analysed using simple descriptive statistics, primarily through frequency counts. The sample consisted of 12 participants aged between 26 and 65 years old. Five participants identified themselves as female, and seven identified themselves as male. Eleven participants resided in Cardiff, while only one participant regularly visited Cardiff. Some participants reported having additional conditions alongside their learning disability, including Autism and Borderline Personality. Some of the participants were accompanied by support (either staff or family members); one

agreed to participate actively, while others agreed to just facilitate (see Table 6-2). The support worker who agreed to participate signed the consent and was asked to answer the questions based on their experience as support workers for people with a learning disability.

Table 6-2: Participants' demographics for the focus groups

Focus Group Number	1	2	3	Total
Number of participants with a learning disability	5	3	4	12
Participants age range	31-65	35-62	26-60	-
Females	2	1	2	5
Males	3	2	2	7
Living in Cardiff	5	3	3	11
Visits Cardiff	0	0	1	1
Number of supports	1	2	0	3
Role of supports	Active participant	Individual support	N/A	N/A

Reflexive thematic analysis

The reflexive thematic analysis in this stage followed the standard six-phase approach, previously detailed in the Methodology chapter, Data Analysis section. In the familiarisation phase, the researcher identified key themes, such as familiarity with spaces, which remained crucial for accessibility. However, participants also noted that even familiar spaces could be confusing, particularly if wayfinding were unsupported. The importance of staff was emphasised, with participants highlighting that staff presence helped to reduce unfamiliarity and facilitate navigation.

During the code generation phase, key codes, such as wayfinding, the need for staff, and recovery spaces, became apparent. Participants noted that familiarity and staff facilitated navigation, while inadequate facilities and unclear signage were prevalent obstacles. The recovery space emerged as a vital necessity for stress relief, with participants emphasising the importance of quiet rooms or private areas for managing sensory overload, particularly during peak times.

In the theme construction phase, the codes were grouped into methodological insights and architectural insights. Methodological insights emphasised the importance of the facilitator and utilising open-ended questions, allowing participants to express their thoughts in depth. The architectural insights highlighted both intangible insights, such as the need for trained floor staff, and tangible insights, like wayfinding difficulties, lack of recovery spaces, and inadequate signage.

The reviewing themes phase refined the themes further, with intangible and tangible insights emerging as essential for navigating public spaces. Wayfinding was a critical

issue, with participants expressing that better signage and more staff could alleviate stress. Recovery spaces were seen as necessary for mental well-being, and sensory overload was a frequent concern, particularly regarding bright artificial lighting.

In the naming and defining themes phase, the final themes were consolidated into methodological insights and architectural insights. Familiarity, facilities, and recovery spaces were key to improving accessibility. Wayfinding remained a significant challenge, underscoring the need for clear signage, landmarks, and staff assistance.

Ultimately, the findings were presented, which underscored the necessity for collaborative research methods and inclusive design solutions that prioritise familiarity, wayfinding, recovery spaces, and sensory management. The findings from this stage will be discussed in detail below.

Findings

This section presents the themes raised from the analysis, including methodological insights and architectural insights that encompass both intangible and tangible aspects, and contextualises them within the existing literature. The section concludes with consultations to verify the findings and discuss their implications for the next stage.

Methodological insights

While conducting and analysing the focus groups, several insights regarding the accessibility of the research process itself emerged. These insights will later be incorporated into the methodological framework for conducting architectural research with people with a learning disability. The insights are presented to follow a logical progression. Accordingly, this section first discusses the role of the facilitator, then the value of open-ended questions, and concludes with prompts.

Facilitator

The facilitator's role remained prominent at this stage. Alongside her earlier responsibilities, she undertook new tasks at this stage, such as meeting participants at a designated point and guiding them to the venue. Furthermore, she co-moderated the sessions, often offering personal examples to participants who were uncertain about specific questions. For example:

Researcher: What is an example of a good entrance? You [referring to Sam] said [shop name].

Sam: [shop name]. Yeah, definitely. Definitely that.

Sophia: I am trying to think.

Hamida: What about the [building name]?

Sam: Yeah, [building name] is the best, Oh yeah.

Sophia: You walk in, and it opens

Sam: It opens yeah, it is like it opens like that.

Open questions

Open-ended questions proved invaluable during the earlier stages. With the aim of deeper exploration, they were chosen to provide participants with greater expressive freedom. This was crucial at this stage as it significantly boosted the participants' engagement not only with the moderators but also with one another. This aligns with Mencap's recommendations on communicating with people with a learning disability (Mencap 2016).

Prompts

During the two previous stages, cue cards played a significant role in prompting participants, and being in the environment proved invaluable as well. However, both were not utilised in this stage but were compensated in aiding the session presentation with photos (see Figure 6-2), which the participants regularly reflected on. For example, Michael noted: "Too much for me cause I don't like it. Gives me migraine. I prefer something like on the picture".

Additionally, voting was also utilised to overcome the monotony of the discussion (see Table 6-1). The last vote aimed to prioritise the theme to support the design of the co-design workshops. The participants were asked to raise their hands if they thought the theme was important. However, the groupthink effect was sometimes clear in this task compared to the other sections of the workshop, which is a potential challenge in focus groups (Bhattacherjee 2012; Lucas 2016). Consequently, the qualitative data from the focus groups' discussion were more valuable and indicative than the voting task.

Architectural insights

The primary aim of this stage was to validate the architectural insights that emerged in the previous stages. Although the stage was directed towards tangible barriers, the data also revealed intangible barriers with a similar effect on accessibility as tangible ones. Additionally, the data yielded some solutions to overcome these barriers, although this was not the primary aim of this stage; accordingly, each theme begins with discussing the barriers, followed by the solutions.

Intangible insights

The participants highlighted two intangible insights, including the intersection of needs and staff, which were also mentioned in the previous stage.

Intersecting needs

In the previous chapter, the Inclusive empathy theme was discussed, as people with a learning disability pointed out accessibility barriers for other disabilities, such as the lack of wide aisles for wheelchair users. During the focus groups, this remained clear; however, reflections on other conditions or situations the participants themselves may have experienced were also noted. For example, navigating to a toilet while having a

learning disability and impaired mobility makes the process mentally and physically exhausting.

Notably, multiple intersectionalities with learning disability may exacerbate accessibility barriers, for example:

- People with a learning disability are 10 times more likely to have a visual impairment compared to the general population (The United Kingdom Practice and Development Team and Royal National Institute of Blind People Visual Impairment Learning Disability and Complex Needs Services 2015).
- 40% of people with a learning disability are reported to have a hearing impairment (Carvill 2001).
- 28.6% of people with a learning disability also have autism (National Health Service England 2020)
- People with a learning disability have higher rates of diabetes, asthma, arthritis, cardiac disease, hypertension, and mental health conditions (Cooper et al. 2007; Reichard and Stolzle 2011; Slayter 2016; Hatton et al. 2017; Dembo et al. 2018; Hatton et al. 2018; Reichard et al. 2019).

These examples underscore the need for a holistic approach to accessibility, as many disabilities often co-occur, as was also evident in the sample demographics. Interestingly, to the best of the researchers' knowledge, no previous research addressed this point.

Staff

Staff are an essential asset in building accessibility. Participants interpreted staff in two different ways: support staff and floor staff. Hence, whenever staff was mentioned, there was a follow-up to ensure the intended meaning. This section focuses on floor staff. For many participants, the availability of staff, whether security personnel or floor staff, meant familiarity. The attendance of trained staff to signpost helps to overcome unfamiliarity. Participants highlighted a lack of staff, as it is not easy to find a person to ask for directions. Freya said, “They are all busy”, which creates stress in the wayfinding process, especially if the person has another disability.

Another note related to staff was the information desk. Participants highlighted that the centre had only one information desk, located on the first floor. Several participants noted that its location was unclear, and many were unaware of its existence entirely. They emphasised the need for multiple information points, ideally positioned near key entrances, to improve visibility and access upon arrival, aligning with previous research (Castell 2012).

Tangible insights

The main aim of this stage was to validate the architectural barriers identified in the previous stages. The insights are presented from general perceptions, including: familiarity, wayfinding, sensory overload, flexibility and safety, to specific design

elements, including: space proportions, recovery space and facilities, concluding with the building's exterior and access.

Familiarity

In the previous research stages, familiarity emerged as a key feature in accessibility, encompassing both intangible and tangible attributes. During the focus groups, familiarity remained a key aspect of accessibility, as the majority of participants stated that familiarity with a place makes it more accessible to them. Interestingly, since the focus groups aimed to explore the barriers in detail, it was found that participants translated familiarity into other accessibility features, such as wayfinding, facilities, safety, brands, and staff. Some of these accessibility features were asserted by most participants during the focus groups, wayfinding and facilities, while others were mentioned less frequently (see Figure 6-6).



Figure 6-6: Participants' interpretation of familiarity during the focus groups

Most participants interpreted familiarity as the ability to navigate the space. However, it does not guarantee full accessibility; some participants said that they might still feel confused around places they are familiar with. As Daniel highlighted:

> *"Yes, it is familiar. Sometimes it is a bit confusing when I ask myself where certain shops are, where do I get a bit confused. Sometimes I got to ask somebody a security or a member of staff on the customer service."*

To overcome this, participants recommended various wayfinding aids. These included both non-architectural features, such as support staff and floor staff, as well as architectural features, including a reception desk, landmarks and signs. Moreover, Freya highlighted that a lack of familiarity leads to a stressful wayfinding process, which will be detailed in the Wayfinding section.

In addition to wayfinding, there was a clear connection between familiarity and the availability of facilities; the presence of various facilities meant higher accessibility, regardless of whether the place was familiar or not. These included toilets, lifts, and signs, as well as the maintenance, locations, and availability of these, which will be discussed in detail later in the Facilities section. A participant also made a connection between familiarity and safety. Another connection was with brands/chain stores, which was also mentioned in the walking interviews and correlates with the existing literature

(Mathers 2008). In addition, participants reported that having support staff or friends with them also helped them overcome unfamiliarity, a point also mentioned during the walking interviews.

Wayfinding

Wayfinding was identified as a clear challenge during the previous research stages and in the existing literature (Salmi 2007; Castell 2012). During the focus groups, participants translated familiarity as an easy wayfinding experience, meaning that if they are familiar with a place, they can navigate through it easily. Not being able to navigate can cause stress and might lead people with a learning disability to leave, especially if the space is crowded, which increases their stress.

Wayfinding is also more stressful if the participant has another disability, such as a physical impairment, which will make the wayfinding task more physically and mentally exhausting. Another added stress is if the user is desperate to reach a destination, such as an exit, recovery space, or toilet. What adds to this stress is that many participants will not ask for directions due to shyness or a lack of trust, and their primary way of wayfinding is to keep walking. For example, some would keep walking, following the crowds, in case they remembered something or to reach an entrance. This wayfinding mechanism was also clear in the walking interviews.

Similarly, it was clear during the walking interviews and in the focus groups that the centre lacked wayfinding cues, as it was hard for the participants to signpost themselves or find what they were looking for. These included signs, maps, and landmarks. Participants noted that signs would help overcome unfamiliarity and support both interior and exterior navigation. Signs were not only translated by the participants as directional signs but also as labels, maps, and directories.

Moreover, the participants highlighted the significance of clear signs, noting that the centre lacked sufficient signs and that the existing signs were also unclear. This also agrees with the walking interviews. They suggested that signs be located at the entrances, as many people would go to the entrance to ask for/need advice as soon as they arrive. Additionally, participants highlighted various features of signs to make them more accessible (see Figure 6-7).

To start with, signs need to be evenly distributed around the building and outside of it. They also need to be in large print and have a good colour contrast with their surroundings, as well as a good colour contrast between the background and the writing, especially for people with visual impairments, considering the intersectionality of learning disability and visual impairment, as mentioned earlier. This aligns with the existing literature (Salmi 2007; Castell 2012). Additionally, signs should be in Easy-Read format or include standard symbols, particularly for individuals who are illiterate. Highlighting the fact that only 36% of people with a learning disability in England undertake some form of education or training (Emerson and Hatton 2008).

Participants mentioned that a clear sign should indicate where you are; it also needs to be accessible for different disabilities, for example, being tactile for people with visual impairments. The building should also offer options for signs, such as directional signs, directories, maps, and electronic maps. Signs should also be visible and well-lit. Since all signs in Wales need to be bilingual, participants emphasised the importance of maintaining a clear distinction between English and Welsh. Signs should also provide directions. Lastly, participants emphasised that signs should be provided at multiple heights and in different formats, not only to ensure visibility for a range of users (e.g. standing adults, wheelchair users), but also to serve varied functions: directing movement, confirming location, and reassuring users of their route.

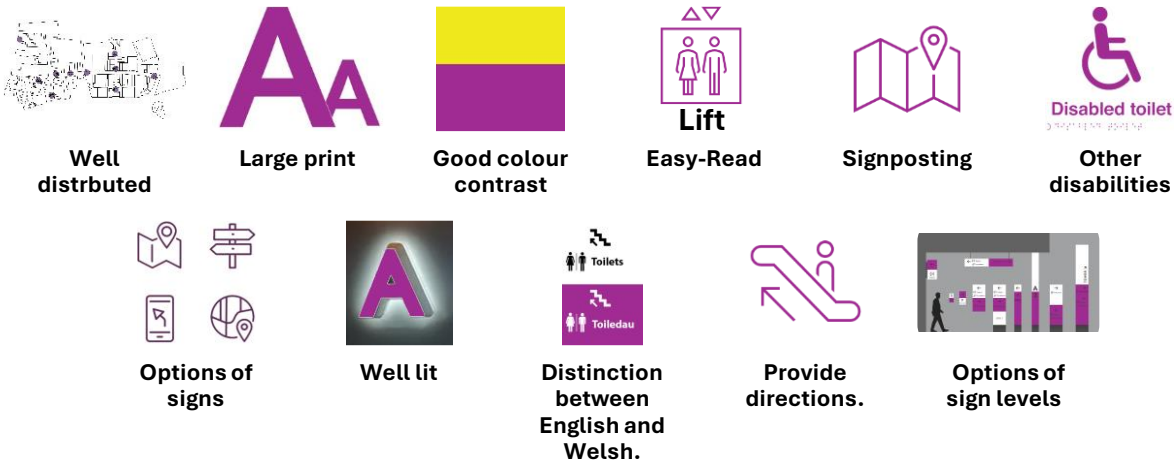


Figure 6-7: Accessible signs' features as highlighted by participants during focus groups

Similar to familiarity, having support staff aids the wayfinding process. Moreover, landmarks are another wayfinding cue mentioned by participants, aligning with existing literature (Salmi 2007; Castell 2012). Examples of landmarks mentioned by the participants included statues, decorative features such as Christmas trees, and famous/major shops. Maps were another wayfinding cue suggested by the participants. They can be a great wayfinding aid for some people with a learning disability. Although not all of them were good with maps, some of them preferred using them. This highlights the importance of flexibility and having options. Similar to signs, options for maps should be available, such as wall maps, leaflets, and electronic maps. The accessibility of the maps should also be considered, with options available in Easy-Read and large font.

Sensory overload

During the walking interviews, the most prominent sensory stressors were visual, auditory, and tactile, all of which were echoed in the focus groups. Sound and touch will be discussed in the Space Proportion section, specifically in relation to crowds; therefore, this section will focus on the visual aspect.

During the focus groups, there was a clear inclination towards natural lighting; a mix of natural lighting and artificial lighting was also considered a good design approach. Participants liked the skylights in the centre, aligning with the walking interviews (see Figure 6-8).

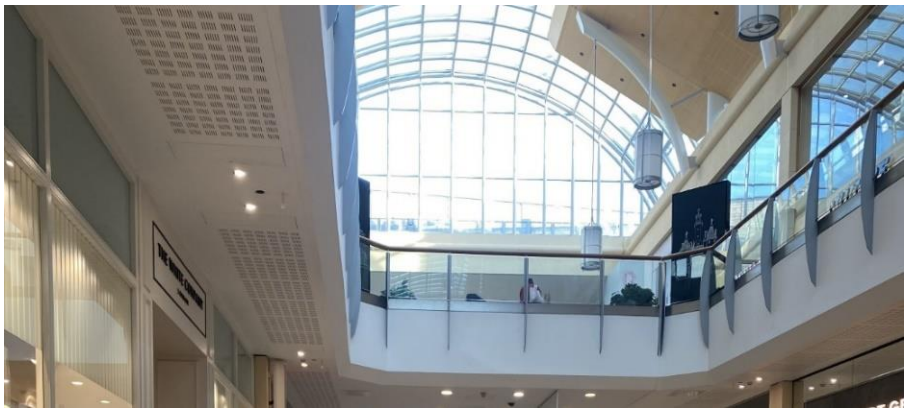


Figure 6-8: An example of skylights in the centre that were preferred by the participants.

On the other hand, artificial lighting was not preferred. Participants reported leaving if the light was too bright. They had several reasons why they did not enjoy artificial lighting; these were amplified if the lighting was blurry or flickering, which relates to the maintenance aspect of the facilities. The reasons included:

- “My skin changes, it goes red”, “It is blinding, tiring”, Sophia.
- It changes the colour of the product.
- Causes headache.
- “It can make you feel too hot”, Grace.
- “It gives me migraine”, Michael.
- Lack of transition between inside and outside
- “It hurts my eyes”, Sam.

However, if it cannot be averted, the glare should be avoided, aligning with previous research (Castell 2012). Participants described good lighting as relaxing and not too bright. It also needs to be dimmable.

There was an inclination toward adding more colour, but not too many colours. That was the same for decorations. Participants preferred having more decorations in the centre, not only during festive periods, but also not too many decorations. Sam mentioned that decorations are uplifting and “brighten up the mood.” Some participants preferred the decorations inspired by nature, such as greenery and flowers.

Flexibility

Similar to the previous stage, participants preferred different options, as evident in the various architectural insights, which allowed them to choose what works best. It was clear that a lack of options might stop people from visiting the place altogether. Participants highlighted that options are more important for disabled people, which aligns with existing literature (Mathers 2008). They discussed having options in vertical

connections, as many participants preferred lifts to escalators. However, it was mentioned that it is not easy to find a lift, and they are usually “tucked away”. Participants also highlighted the importance of having options in recovery spaces, signs and entrances.

Safety

Safety was a clear feature of an accessible environment. Participants noted several features that enhanced the perceived sense of safety, which aligns with previous research (Barr et al. 2003). These include security personnel and floor staff. However, participants highlighted that they can be hard to find. Another safety feature is the use of security cameras; participants elaborated on how they make them feel safe, as everything is being monitored. Safety was also ensured through the use of safe materials, especially non-slippery floors. The last safety feature mentioned was access to a first aid station in the event of an emergency.

Space proportions

In general, participants preferred spacious, open places, as these felt less busy and reduced crowd stress. However, participants noted discomfort with spaces that appeared excessively vast, creating feelings of overwhelm. It was further observed that the perception of scale could be significantly affected by how crowded a space was; even a generously sized space could feel cramped and claustrophobic when densely populated (see Figure 6-9). Participants generally favoured environments designed to a human scale but appreciated occasional variations in scale to alleviate crowding. Thus, a balanced mix of scales could be beneficial. This aligns with previous research that space proportion affects the feelings of users with a learning disability (Hafez et al. 2021).

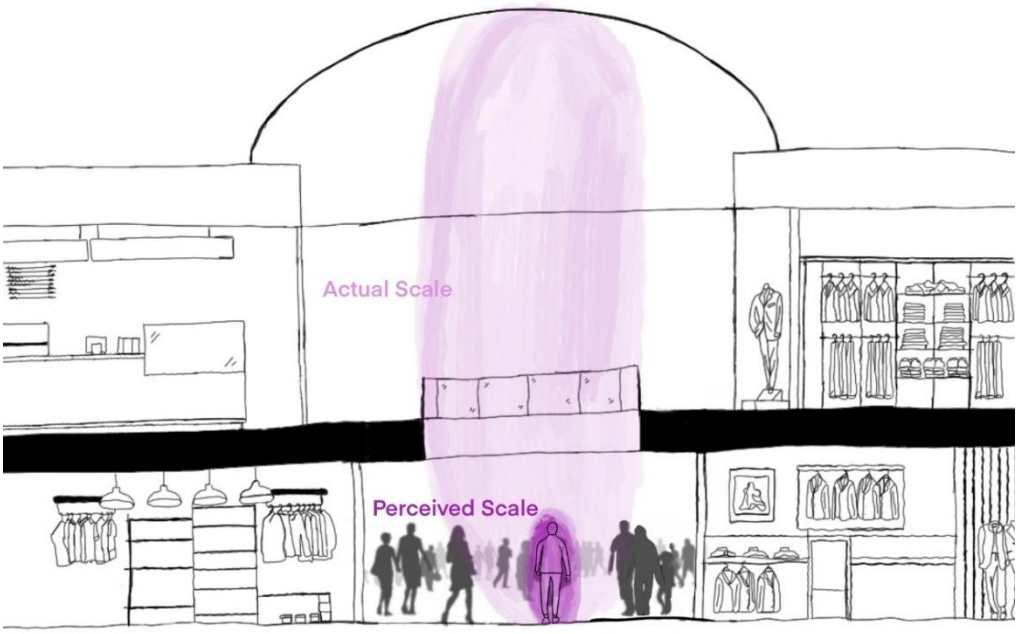


Figure 6-9: Actual architectural scale versus perceived scale for people with a learning disability in crowded environments.

Participants did not enjoy being around crowds, echoing the findings of the walking interviews. They reported that crowds caused stress, claustrophobia, anxiety, nervousness, panic, anger, and feelings of being overwhelmed. Michael described it as "a nightmare; I just couldn't bear it." Participants valued their personal space, which they perceived as being invaded by the crowds. Crowds can be particularly overwhelming in confined spaces, which can exacerbate feelings of claustrophobia.

As crowds cannot always be avoided, participants had their own ways of coping with crowds, as mentioned in the walking interviews and echoed during the focus groups. These included leaving the centre or returning later, moving to a less crowded space, such as a coffee shop, shop, or outdoor area, while others would try to find their own space. Some would avoid visiting the centre altogether during busy periods or only when accompanied.

Participants provided recommendations to ease crowds. Starting with having a recovery space, which alleviates anxiety, as mentioned earlier. They also suggested implementing a one-way traffic system to manage crowds more effectively. Additionally, they expressed a preference for more spacious shops to avoid feeling confined. Furthermore, they recommended having different exits and entrances, as these are typically busy locations, which will be discussed in detail in the building's exterior and access section.

Recovery spaces

The walking interviews revealed a clear need for space to recover and escape from stressful environments. During the focus groups, all participants emphasised the importance of having a permanent recovery space for mental well-being. Reasons for that included feeling overwhelmed, experiencing panic attacks, suffering from anxiety, dealing with claustrophobia, feeling nervous, needing to rest, or desiring privacy. The primary causes for these various states were crowds and noise.

Participants described the recovery space as "personal" and "quiet". A place where they can take a break, "chill out", "relax", "get a hug", and/or "gather their thoughts". They noted that if such a place existed, they would be able to recover and return to the centre. Therefore, they pointed out that such space needs to be central to all shops. They also pointed out that the centre has numerous empty shops and spaces that can be utilised as recovery spaces.

If a designated room is not feasible, participants suggested different forms of escape space. For example, a quiet corner, a booth, and outdoor spaces can be used as long as they are not busy. Some participants have already used coffee shops or restaurants as a recovery space. However, these areas need to have specific characteristics: they should be spacious, uncluttered, and offer different seating options and zones.

On the other hand, some participants insisted that the recovery space should be a room, emphasising the user's privacy. They highlighted that people with a learning disability who have other conditions such as epilepsy or hearing impairment may need

a room with higher privacy, and they also need to break out totally from the crowds. However, some participants emphasised the importance of privacy, even without these specific conditions. Michael said he does not want people to look at him when he is stressed: “Come and look at people with a learning disability”. Additionally, some participants suggested having more than one recovery space, as they did not want to share a room with others.

Participants highlighted other features in addition to privacy. These included windows, whether in a standalone room or a quiet corner. Openness was also a key feature; the recovery space was often described as being “more open,” a place where the personal space is not invaded.

Some preferred that the space be located near coffee shops where they could have a drink while relaxing. Although the recovery space was not referred to specifically as a sensory room, Grace mentioned that they had a recovery room with sensory lights, which she really preferred. However, other participants had not previously experienced sensory rooms, so they did not comment. Another key feature was knowledge about the space and advertising its availability, which connects to Communication previously mentioned in Chapter 5.

A participant suggested that offering quiet hours can be an alternative in case a recovery space is not feasible, which aligns with the recommendation for accessible shopping centres for disabled people (Vilnai-Yavetz et al. 2024). However, they noted that quiet hours need to be accessible, meaning they should be evenly distributed across weekdays and weekends, with different time slots to accommodate various lifestyles.

Facilities

During the walking interviews, participants highlighted various facilities as essential assets for shopping or simply being in the centre. These included toilets, seats, and staff. During the focus groups, many participants equated familiarity with facilities, as previously mentioned. This suggests that the availability of adequate facilities renders the building more accessible to them. The location, quantity, and availability are crucial to the accessibility of each facility. Another observation from the participants was regarding the maintenance and upkeep of the facilities. For instance, some facilities exist but are neither functional nor clean, rendering them inaccessible. This aligns with earlier research, where people with a learning disability emphasised the importance of having facilities and the ability to use them independently (Barr et al. 2003; Mathers 2008).

Participants highlighted the importance of having toilets in general and disabled toilets in particular. They highlighted the lack of toilet locations and their limited numbers, as well as the difficulty of accessing them, describing them as “tucked away,” especially for users with additional disabilities. A participant also highlighted that the signs leading to the toilets are unclear and that it is a long distance to reach. Participants felt that the toilet locations privilege car owners as they are usually located near the car park.

Another important facility is the seats. Participants emphasised the need for more seats, especially more comfortable ones. Restaurants and coffee shops were also discussed as important facilities. Since the centre had an adequate number of restaurants and coffee shops, the participants did not request any additional ones. However, they mentioned that they use them not only for eating and drinking but also to escape the crowd, as previously mentioned.

Building's exterior and access

Entrances were one of the most crowded areas reported by participants. Participants highlighted that they can be extremely crowded and difficult to access and navigate. Additionally, navigating through the crowds to reach the exit can be a stressful experience. Furthermore, Daniel highlighted some external entrance barriers, including trees that cover parts of the building, making it easy to miss. Coupled with a lack of exterior signs bearing the building's name, especially in cases of periodic historical locations where buildings may share similar exterior styles and materials. Although one participant raised this issue, it was clear through employment experience.

Participants gave examples of entrances they found accessible (see Figure 6-10), which mainly included these features:

- Having more than one entrance/exit
- Clear of obstacles
- Wide enough for a wheelchair user and a carer (double doors)
- Automatic doors were preferred over push/pull doors or push-button doors.
    - Push/pull doors can be unsafe during crowds, creating more crowds around the entrance.
    - Push-button doors can be inaccessible for individuals with limited hand mobility.
- Sliding doors were preferred to swinging doors.
    - Swinging doors can be unsafe during crowds and create more crowds around the entrance.
- Entrances and exits are labelled.



Figure 6-10: An example of a good entrance suggested by the participants (it is wide, opens automatically, slides to the side, clear of obstacles, has more than one option of entrance)

Consultations and implications for the next stage

The tangible insights were discussed with the facilitator to prioritise the themes and translate them into accessible co-design activities for the workshops. Notably, the themes intersected, and some suggested solutions overlapped. For example, a good signage system helps alleviate unfamiliarity and wayfinding, while a recovery space eases sensory overload and enhances the feeling of safety. The discussion can be summarised in the following mind map (see Figure 6-11). As a result, the three topics selected for the co-design workshops were recovery spaces, facilities and wayfinding.

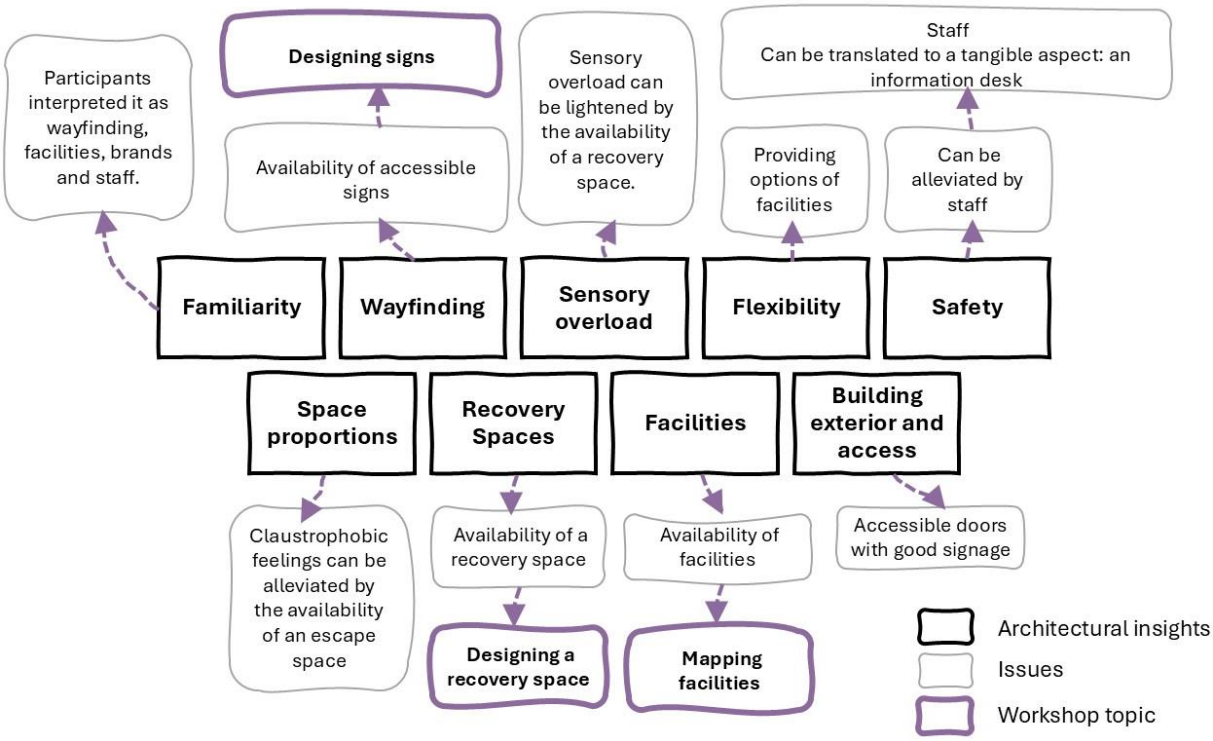


Figure 6-11: The mind map for selecting the co-design workshop topics

Conclusion

This chapter detailed the Synthesising stage of the research, which aimed to validate and synthesise the architectural insights identified in the previous stages. The focus groups served as a critical platform for deepening participant engagement, enabling the collaborative review of earlier findings. The focus groups reinforced and expanded on the previously identified insights, shedding light on the nuanced interplay between tangible and intangible dimensions of the built environment.

The chapter yielded methodological and architectural insights that will be utilised in the following stage, as well as in the formation of the methodological framework and architectural insights, the study's primary objectives. The methodological insights gained from this stage reinforced the importance of collaboration with the facilitator and the use of open-ended questions and various prompts. While the architectural insights emphasised key themes, such as the significance of familiarity, wayfinding, the

need for recovery spaces, and the importance of well-located and accessible facilities. These discussions not only confirmed the credibility of earlier findings but also provided rich insights that directly informed the subsequent research stage, Co-design.

7. CO-DESIGN

This chapter presents the last research stage, Co-design, which aimed to co-design architectural solutions for the barriers identified in the previous stages.

Introduction

The preceding chapter examined the third research stage, Synthesising, which utilised focus groups to validate the identified barriers people with a learning disability face in the built environment. Its conclusion can be categorised into two categories, the methodological insights and the architectural insights, including intangible and tangible barriers. The chapter also concluded with three topics that guided the workshops' structure: recovery spaces, facilities, and wayfinding. In continuation, this chapter presents the last research stage, which aimed to co-design architectural solutions through co-design workshops.

The chapter follows the same structure as the previous fieldwork chapters, including four sections: preparation, data collection, analysis and findings (see Figure 7-1). The preparation started with a literature review on creative methodologies with people with a learning disability, followed by designing the workshop's structure, and then consultations with the facilitator. Then, the data collection included co-design workshops with people with a learning disability. After the data collection, the data were analysed using reflexive thematic analysis to identify key themes. Finally, the findings were presented in accordance with the workshop's structure. The validated findings from the workshops informed the development of the methodological framework and architectural insights presented in the following chapter.

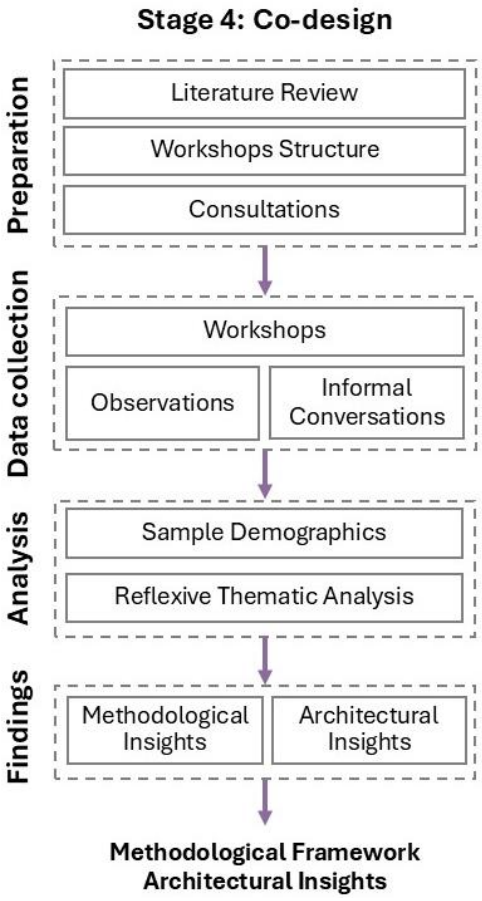


Figure 7-1: The chapter structure encompassing four sections

Preparation

The literature review for conducting group discussions with people with a learning disability was previously discussed in the previous chapter, alongside the focus group preparation. Additionally, the project information sheet, consent form, and introductory question sheet were prepared, similar to those used in the focus groups. Ethical approval for the workshops was also obtained alongside the focus groups.

The preparation also involved reviewing the existing literature on creative methodologies with people with a learning disability, followed by designing the structure of the workshops, utilising the three topics derived from the focus groups: recovery spaces, facilities, and wayfinding. The structure was then discussed with the facilitator through consultations.

Creative methodologies with people with learning disability

Traditional talk or text-based research methods may be inaccessible to many autistic people with additional learning disabilities (Gaudion and Pellicano 2016). Therefore, unless disability studies researchers work to develop inclusive methodologies, the perspectives of some disabled people will continue to be 'missing', as the methods rooted in the dominant individual/medical model often serve to undermine the possibility of such perspectives (Boxall 2010). It is the researchers' responsibility to develop alternative methodologies that enable the participants to engage with and participate in research.

Consequently, creative methodologies should be encouraged to promote personalised care and greater representation in learning disability research (Kennedy and Brewer 2016). Creative methodologies refer to research strategies that go beyond conventional methods by incorporating visual, tactile, performative, and participatory techniques (Gauntlett 2007). They enable participants to contribute on their terms, creating an enjoyable and rewarding experience (Kennedy and Brewer 2016; Fudge Schormans et al. 2019).

These methods provide ways of involving research participants, which are potentially more accessible to disabled people compared to the traditional approaches (Boxall 2010). Hence, they can be beneficial when working with people with a learning disability, for whom traditional methods may limit participation and expression (Nind and Vinha 2016).

Recent qualitative research highlights the value of employing creative and participatory methodologies when engaging people with a learning disability. Prompting researchers to explore innovative multimedia and tactile methods to facilitate active participation and meaningful engagement (Boxall 2010; Kennedy and Brewer 2016). These approaches help address communication barriers and move beyond deficit-based perspectives by promoting personalised, inclusive, and accessible research practices (Gaudion et al. 2014; Kennedy and Brewer 2016).

Integrating creative and participatory methodologies ensures that people with a learning disability actively and meaningfully contribute to the research process. Such inclusive methods not only empower participants by amplifying their voices but also significantly enrich the quality of the research outcomes, ultimately contributing to more inclusive and responsive environments, hence utilised in this stage.

Workshops structure

The workshops aimed to co-design solutions to the challenges raised in the previous research stages. Consequently, answer the final research question: What design strategies can make buildings more inclusive for people with a learning disability? Notably, previous research stages also contributed to answering these questions, as the participants recommended different strategies to overcome accessibility barriers.

Designing a recovery space

The first activity was to design a three-dimensional model of a recovery space individually. Since the design process can be challenging for non-designers and people with a learning disability, the design activity was translated into prompt questions, each of which included various tools and materials. These questions were added to a presentation aided with photos as additional prompts (see Figure 7-2).

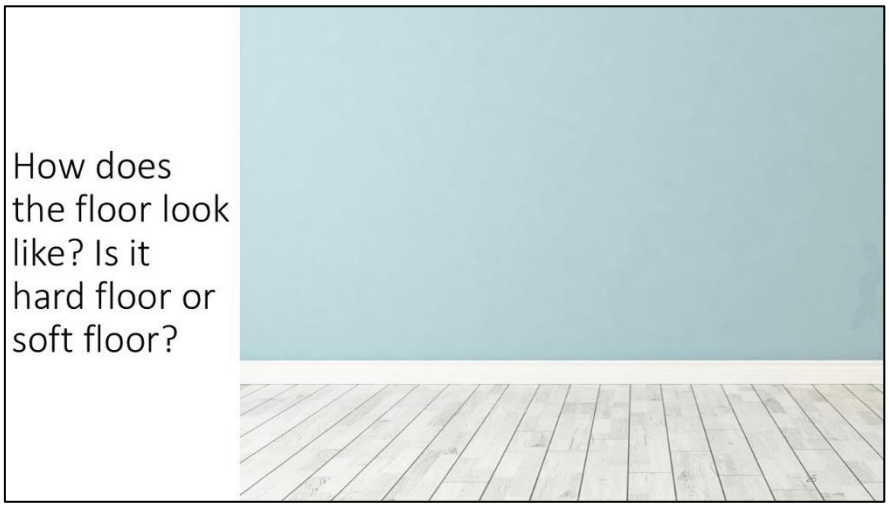


Figure 7-2: The workshops' presentation was aided by prompt photos

1. Where is your recovery space?

Participants were provided with the centre map in large print with the location of main facilities and landmark shops, informed by the walking interviews (see Figure 7-3).



Figure 7-3: The map used to locate recovery spaces with the existing facilities and landmark shops (redacted for anonymity)

2. What is the type of your recovery space?

- Quiet room
- Sensory room
- Quiet corner
- Outdoor space
- Bench
- Other: .....

Participants who chose a closed space were given a cube model to resemble an empty room. The model was constructed from foam boards and glued on only six edges, allowing it to be easily detached for manipulation (see Figure 7-4). The dimensions of the model were inspired by BS 8300-2 (The British Standards Institution 2018). It specifies the minimum size of the quiet room as 2.1 m x 2.3 m. The size chosen for the room was 4 m x 4 m, forming a square for easier manipulation in the subsequent design activities. The selected architectural scale was 1:20, which was sufficiently clear for the participants to create detailed designs for their space.

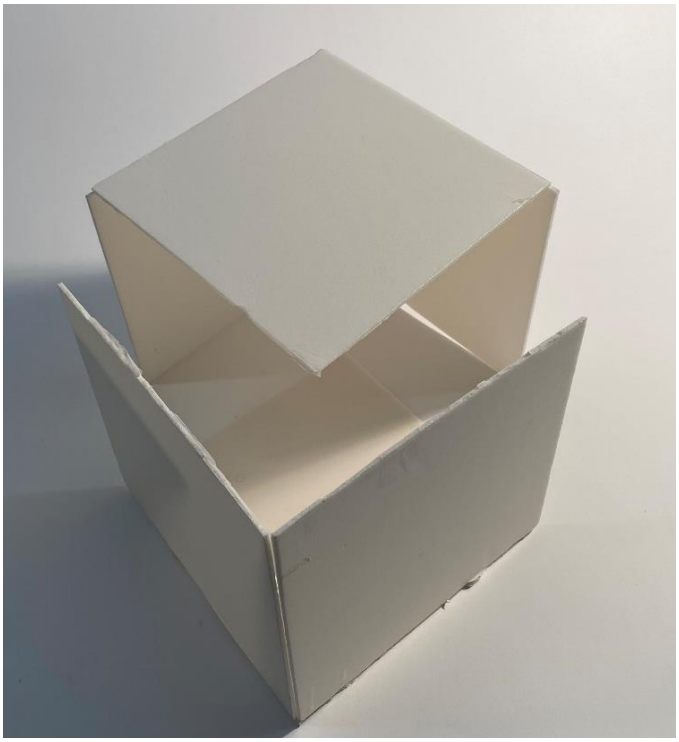


Figure 7-4: Recovery space base model

3. What are the colours of your space?

Participants were provided with coloured papers resembling paint to select their wall colours (see Figure 7-5).



Figure 7-5: Wall colour selection

4. How does the floor look like? Is it a hard floor or a soft floor?

Participants were provided with a selection of printed hard floors and soft floors in soft foam and felt (see Figure 7-6).



Figure 7-6: Floors selection

5. Does it have doors, windows or skylights?

Participants were provided with a printed selection of different doors, windows, skylights, and occupancy indicators for those who wanted to design a single-occupancy room (see Figure 7-7).



Figure 7-7: Openings selection

6. What is the furniture like in your room?

Participants were provided with a 3D-printed selection of different furniture (see Figure 7-8). The furniture selection was inspired by the guidance in PAS 6463:2022 Design for the Mind-Guide (The British Standards Institution 2022) on quiet spaces furnishing:

- Provide comfort.
- Easily repositioned.
- A variety of movable seating to meet a range of user needs, including informal and lower options, such as beanbags and floor cushions.

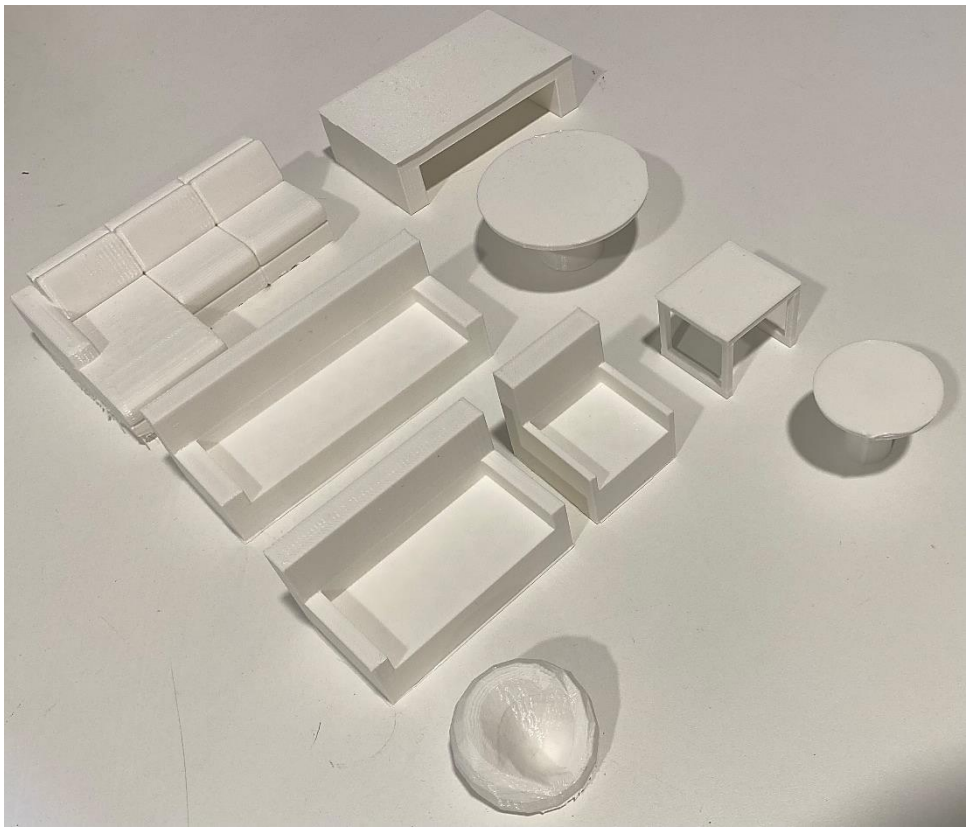


Figure 7-8: Furniture options

7. Now, describe your design

Participants were asked to interpret their design and justify their design decisions verbally.

Locating facilities

The second activity was to identify areas where additional facilities are needed around the centre as a group. The participants were provided with six A1 maps with landmark shops, informed by the walking interviews (see Figure 7-9). Each map focused on a single facility; the maps were:

- Restaurants and coffee shops
- Electronic maps

- Information desk
- Seats
- Toilets
- Vertical connection nodes
- Other (participants can add any facility they need)



Figure 7-9: An example of the centre maps provided to participants with existing seats, signposted by facilities and landmark shops, which the participants used to locate extra seats where needed (redacted for anonymity)

These categories were chosen based on the results of walking interviews and the focus groups. The participants were also given stickers so they could place them where they needed more facilities. The facilities key on the maps and stickers had the same shape, size, and colour, making it easier for participants to interact with the activity.

Designing signs

The last activity was designing signs individually. Like designing recovery spaces activity, the design process was divided into stages with different prompt questions. These questions were also added to the workshop presentation, aided with photos as additional prompts.

1. **Which type of sign are you designing?**

   Participants chose what type of sign they wanted to design (see Figure 7-10).

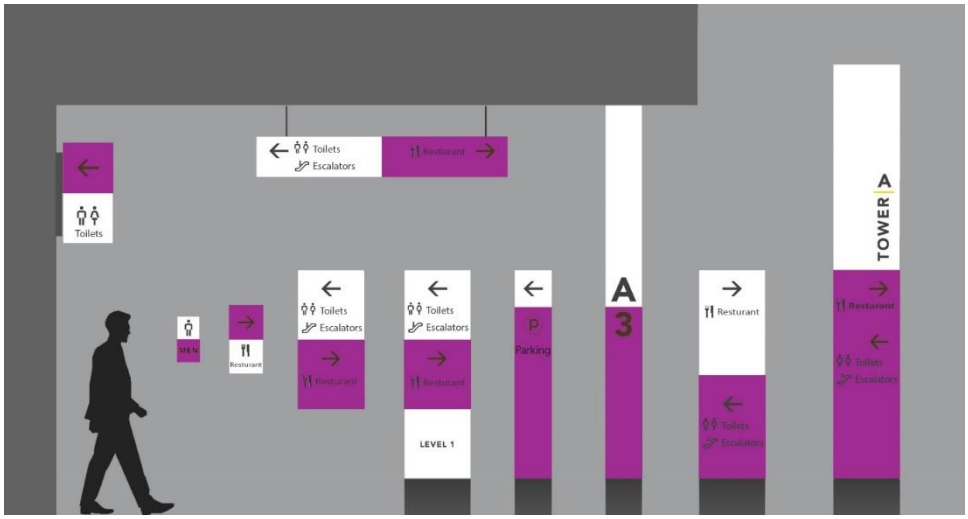


Figure 7-10: Signs types for the participants to choose from

2. What is the colour of your sign? Is it one colour?

Participants were provided with coloured papers and pens to select the colour of the signs and text (see Figure 7-11).



Figure 7-11: Coloured papers and pens for sign designing sign

3. Don't forget the Welsh translation

Participants were provided with the Welsh translation for common signs and asked whether they wanted different colours for Welsh and English or just one colour (see Figure 7-12).

Toilets	Toiledu
Escalator	Grisiau Symudol
Restaurant	Bwyty
Men	Dynion
Women	Merched
Disabled	Anabl
Cafe	Caffi

Figure 7-12: Welsh translation for common signs

Consultations

The facilitator reviewed the workshop's agenda and structure. Additionally, a pilot study was conducted with her to assess the accessibility of the workshop and estimate the time needed for each activity. The facilitator designed her recovery space before the workshop so it could be used as an example for the participants (see Figure 7-13).

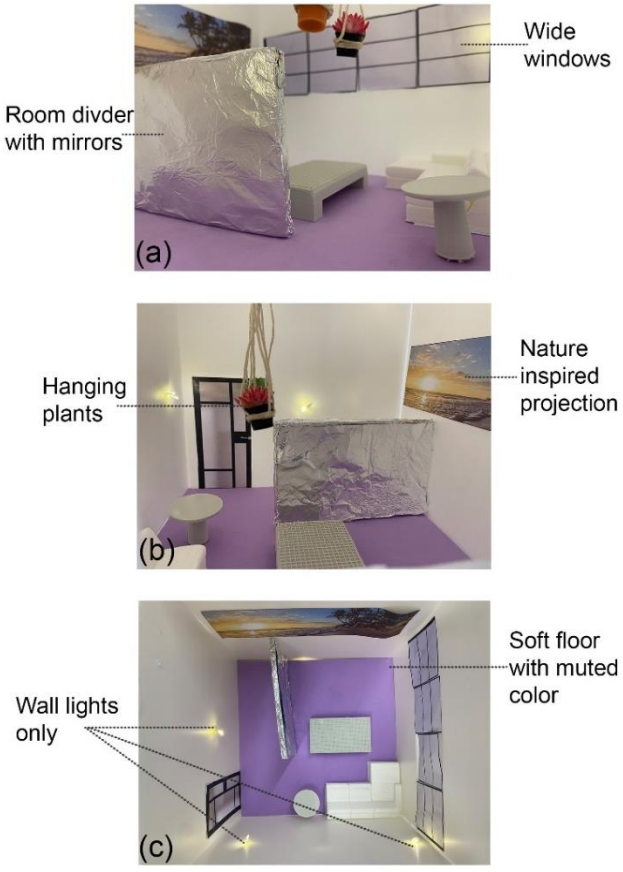


Figure 7-13: The facilitator recovery space model as viewed from (a) the window, (b) the door, and (c) the ceiling.

Another aspect of the design process, sensory features, was added based on Hamida's design. The different sensory features were selected based on her suggestions and the recommendation of PAS 6463:2022 Design for the Mind-Guide (The British Standards Institution 2022)

7. Do you want to add any sensory items?

Participants were provided with different sensory features (see Figure 7-14):

- Lighting options
- Glow sticks
- Plant pots and trees
- Tactile features
- Visual features
- Nature-inspired projections
- Televisions of different sizes
- Foil paper to mimic mirrors

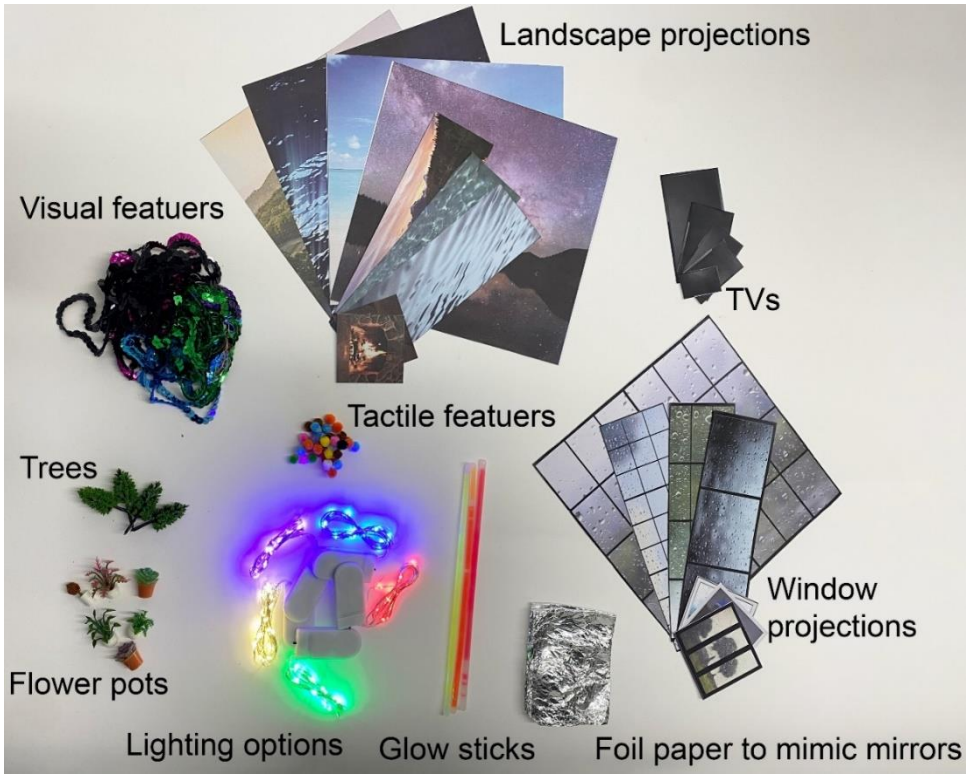


Figure 7-14: Sensory features

Following the consultations, the agenda of the workshops was developed, divided into three sections, with a break between each section (see Table 7-1). The workshop lasted 180 minutes. Unlike the focus groups, the duration of each section varied depending on the activities and tools used.

Table 7-1: The agenda for the co-design workshops following consultations

Duration	Topic	Activity	Tools
15 minutes	Introduction	N/A	Verbal admission
70 minutes	Recovery spaces	Designing a recovery space	Verbal admission Centre maps Various 3D design tools
30 minutes	Lunch break		
20 minutes	Facilities	Locating facilities	Centre maps Colour-coded stickers
15 minutes	Comfort break		
30 minutes	Wayfinding	Designing signs	Coloured papers and markers

Data Collection

Similar to the focus groups, the workshops were held in three consecutive sessions, with participants ranging between three and five. They were held in the host school on three different days, including one on the weekend. Each session had two moderators: the researcher and Hamida. Recruitment also followed the same approach as the focus groups, with the same eligibility criteria. Since the workshops were also conducted in the same venue as the focus groups, the facilitator met the participants in an agreed location in the City Centre and led them to the venue. Following the same manner as the focus groups, the workshop rules and agenda in Easy-Read format were also printed out and pinned up in the room before the start of the workshops.

Similarly, the workshops began with reading out the workshop rules and project information, signing the consent form, and completing the introductory form. All the workshops were audio recorded using the university's recording software, Panopto, which was directly uploaded and transcribed onto the university's secure cloud. Support staff and family members were also allowed to attend the workshops. The workshop space was arranged into different zones for each design activity to support fresh starts (see Figure 7-15).

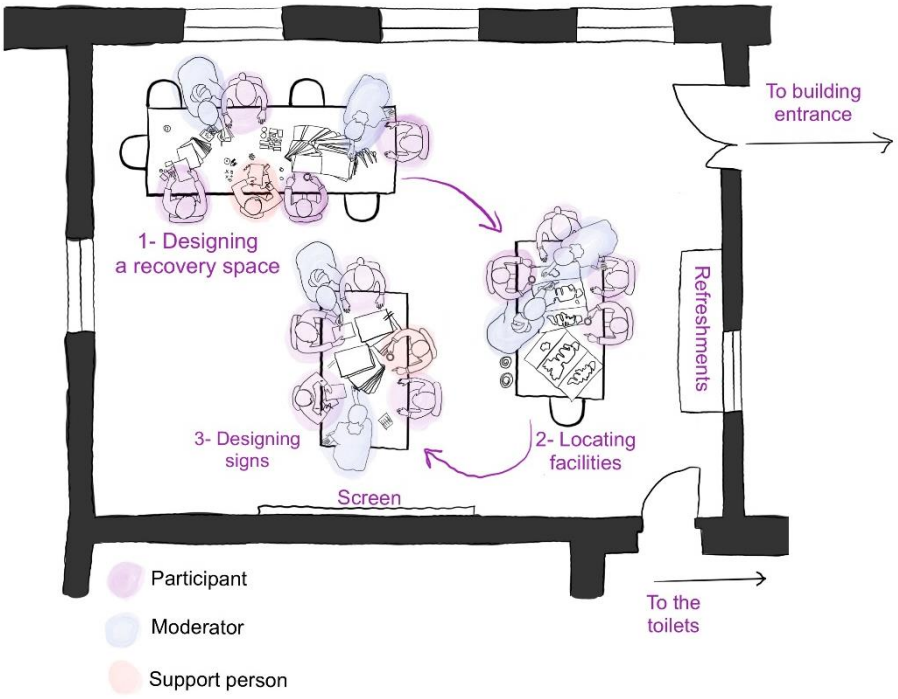


Figure 7-15: The layout of the workshop space, with zones for the different activities

The first activity was designing a recovery space. The participants were shown the facilitator's design as an example of what they could achieve (see Figure 7-13). The facilitator also explained her design decisions to them. The participants' ability to manipulate the different design tools provided varied widely. Ranging from participants who were totally independent and did not require any support to those who were totally dependent on the researcher, facilitator, or their support staff, while only indicating their preference. This was the most engaging activity during the workshop, although it was the longest (see Figure 7-16).

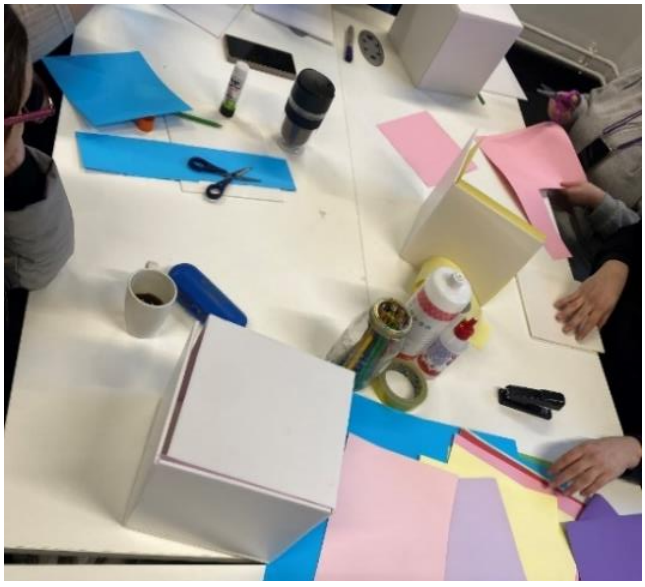


Figure 7-16: Participants working on their recovery space design

After the lunch break, the second activity was to locate facilities, where the participants worked together to decide whether the existing facilities were sufficient and, if not, where new facilities should be added (see Figure 7-17). Since this activity heavily involved understanding a map, each location chosen was reinterpreted in relation to its surroundings to ensure the correct interpretation of the choice. Additionally, the group discussed their decisions and helped each other interpret the map.

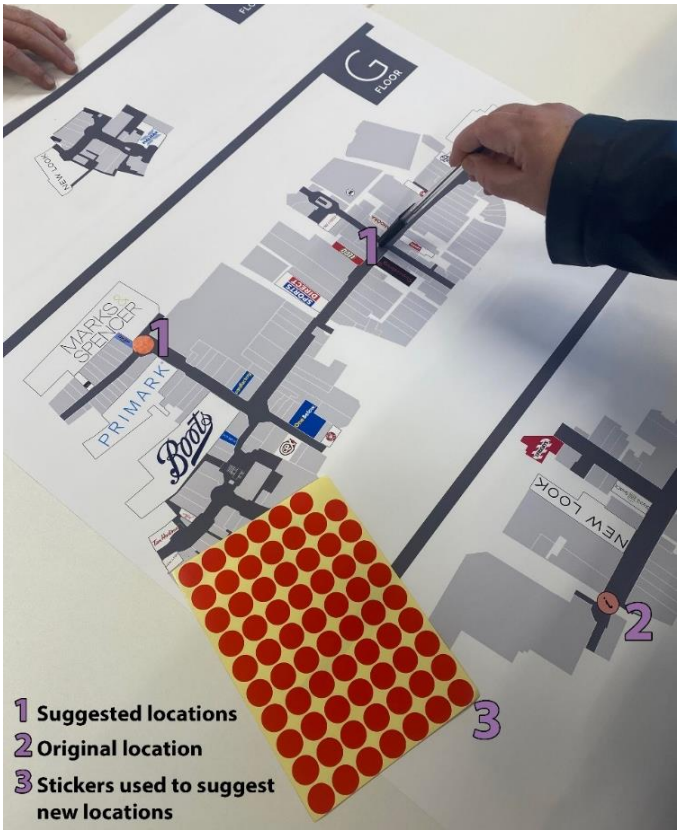


Figure 7-17: Participants locating extra information desks around the centre

After a brief break, participants began the final task, designing signs. During the first workshop, it was noted that the participants found the task confusing, and their engagement levels varied. Hence, the task was translated into verbal admission, where participants were asked to choose the colours of the sign and the font colour without drawing or writing the sign.

Analysis

This stage's analysis followed the reflexive thematic analysis approach. After transcribing the workshops, the outputs were sorted and categorised alongside the informal conversations, observations, notes, and photos, which were collectively analysed as one integrated qualitative dataset. Before thematic coding, the sample demographics were analysed.

Sample demographics

Demographic data were analysed using simple descriptive statistics, primarily through frequency counts. The sample consisted of 14 participants aged between 26 and 65 years old. Seven identified as females and seven identified as males. Twelve participants resided in Cardiff, while two participants regularly visited Cardiff. Some of the participants were accompanied by support persons (either staff or family members), but none of them agreed to participate actively; however, some supported the participants during the design activities (see Table 7-2).

Table 7-2 : Participants' demographics for the co-design workshops

Workshop number	1	2	3	Total
Number of participants with a learning disability	4	5	5	14
Participants age range	36-54	26-66	35-62	-
Females	2	4	1	7
Males	2	1	4	7
Living in Cardiff	3	4	5	12
Visits Cardiff	1	1	0	2
Number of supports	1	1	3	4

Reflexive thematic analysis

The reflexive thematic analysis followed the same process as previous stages, which was previously detailed in the Methodology chapter, Data Analysis section. During the familiarisation phase, the researcher engaged with the workshop outputs, including the transcriptions, models and maps. The significance of personalisation in the design process was initially identified. Moreover, participants emphasised the need for designs that accommodate diverse abilities, ensuring equal participation regardless of physical or cognitive limitations. Additionally, the facilitator's role remained pivotal as she assisted participants with limited manual abilities in expressing their ideas.

In the code generation phase, key codes emerged, some of which resonated with findings from previous stages. For instance, personalisation in the co-design process, recovery space design, and preferences for vibrant colours were highlighted. During the theme construction phase, codes were categorised into methodological insights and architectural insights. Methodological insights included the significance of the facilitator’s role, personalisation, and the role of carers. Architectural insights encompassed recovery spaces, the strategic arrangement of facilities, and accessible signage.

The themes were refined during the review phase. Recovery spaces were characterised as private, tranquil incorporating features that connected them to nature. The theme of signage was broadened, emphasising the necessity for clear, large signage with an emphasis on colour contrast and symbols.

In the naming and defining phase, the final themes were as follows: methodological insights, personalisation of tasks, and support. Architectural insights: Key design solutions comprised recovery spaces with privacy, strategic placement of facilities, and accessible signage.

In the writing phase, the researcher integrated the findings, emphasising the need for personalisation and collaboration in the design process. Recovery spaces and well-placed facilities were highlighted as essential components of accessible environments, alongside accessible signage that used bright colours, large fonts, and symbols to aid navigation, which will be discussed in detail below.

Findings

This section presents the themes raised from the analysis, including methodological insights and architectural insights.

Methodological insights

The co-design workshops yielded methodological insights related to conducting architectural research with people with a learning disability. This included personalisation, aligning with previous research stages and support, which is a novel theme in this stage.

Personalisation

Activities were adapted to suit each participant's abilities, ensuring equal opportunity for contribution regardless of individual differences. This flexible approach enabled all participants to produce meaningful outputs, demonstrating the importance of tailoring design methods to individual capabilities. This aligns with the findings of previous stages and emphasises the vitality of utilising creative methodologies.

Moreover, the use of prompts, such as questions, photographs, maps, and both 2D and 3D tools, proved vital in guiding participants through the design process. These materials helped simplify abstract tasks, made ideas more tangible, and improved communication across a range of cognitive and communicative abilities. Their effective use in every research stage underscores the value of prompt-based engagement in inclusive research, which aligns with previous research (Kindon et al. 2007; Fudge Schormans et al. 2019).

Support

The presence of both familiar moderators and supportive carers was vital. The facilitator's support proved indispensable throughout all stages of the research. In this phase, her role expanded to include assisting participants with limited manual abilities in expressing their ideas during the model-making and design tasks. This effort would have been difficult for a single moderator (see Figure 7-15).

Additionally, carers were allowed to participate in the workshops. They played a supporting role. Although they did not actively participate in the design process, their

presence helped some participants with communication or motor challenges engage more fully in the workshops (see Figure 7-15).

Architectural insights

The architectural insights in this stage provided an in-depth exploration of accessible design strategies for recovery spaces, facilities, and signs. They are presented in accordance with the workshops' agenda.

Recovery spaces

Throughout the design process of recovery spaces, their features were clarified. Some were revealed at earlier stages, while others were unique outcomes of the workshops. They will be discussed based on the design activity questions.

Firstly, in terms of location, some participants placed their recovery space near their favourite shop or where they often used the centre, while others situated it near cafes and toilets, aligning with the findings from the previous stages. One group located their spaces outside the centre or on the outer perimeter, where they usually go when stressed. It was noted that no one placed their space on the lower floor, which can be attributed to the lower footfall noted in the walking interviews (see Figure 7-18).



Figure 7-18: Recovery space location selection, either around familiar routes (from the walking interviews), facilities, or outside the centre

Regarding space type, all the participants chose to design a room that was either a sensory room, a quiet room, or just a regular room. This contradicts the findings of the walking interviews and focus groups, where some participants mentioned that a recovery space does not necessarily have to be a dedicated room.

Wall colour selection varied widely among participants, with some choosing one colour and others choosing two colours. Half of the participants chose blue and green hues, and half chose white in their selection. Around a third of the participants used bright, vivid colours (see Figure 7-19).



Figure 7-19: Participants' selection for the recovery space wall colours

For floor material, most choices were soft floors, which can be linked to the safety theme emphasised in earlier stages, with wooden floors being the second most preferred option. The colours were mainly nature-inspired, neutral, or muted, contrasting with the wall selections (see Figure *7-20*).



Figure 7-20: Participants' selection for the recovery space floor material

Regarding openings, each participant had at least one door and one window. However, most of them had a selection of windows and skylights (see Figure 7-21). The occupancy indicator was only used twice, although participants described the room on different occasions as “personal”. Some participants expressed concerns about the room's accessibility and whether the provided door was wide enough for wheelchair users, highlighting the inclusive empathy and intersecting needs themes from the previous stages.

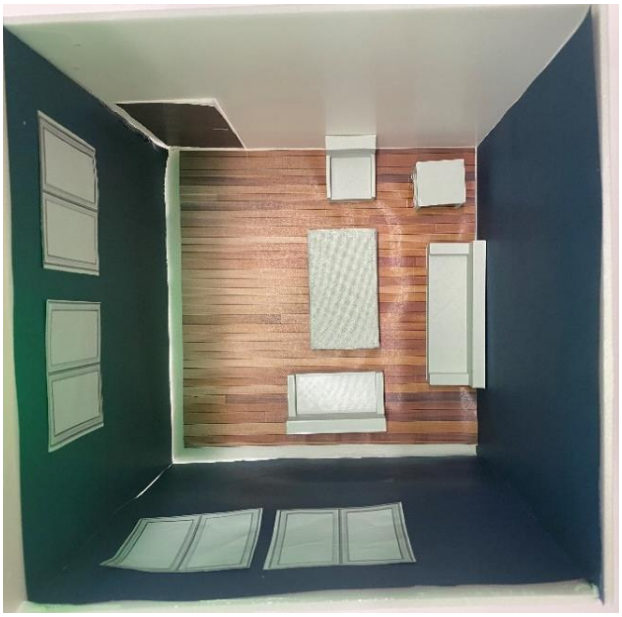


Figure 7-21: Top view of Sebastian's recovery space, where he used four windows on two walls

Participants arranged the furniture similar to a home setting, and some chose to add a television, which increased the home feeling (see Figure 7-22). All the different furniture provided was used.



Figure 7-22: Top view of Skylar’s quiet space, where she arranged the furniture in a homely manner: a simple L-shaped sofa with a coffee table facing a television

All participants added various sensory items; the most popular sensory items were the lights and plants. No one used mirrors except the facilitator. Each design had at least two features that connected the space with nature, such as a window, skylight, the use of natural materials such as wood, or the incorporation of greenery (see Figure 7-23).

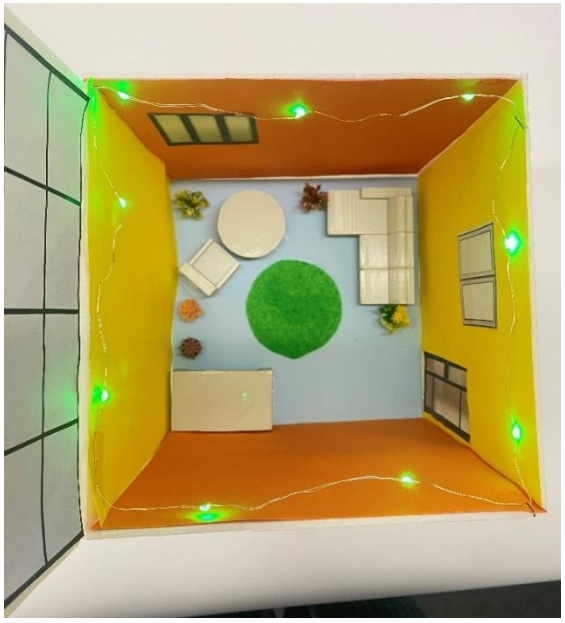


Figure 7-23: Top view of Sam's design where he incorporated two windows and a full skylight ceiling in addition to plants and nature-inspired hues, floors, and lights

The final task of designing the recovery space was to describe the design; however, not all participants were able to do so, emphasising the vitality of creative methodologies previously mentioned, where people with a learning disability might be able to express themselves in creative tasks compared to words. The descriptions featured the space as comfortable, quiet and relaxing. Examples of the descriptions were:

- *"I basically like it because when I am anxious or if I am really stressed, I can go there. I think for the design itself it is quite a comfort zone as well where I can come and chill and like hear the rain"* Skylar.
- *"Someone can go and have a break when shopping. I was thinking of the sky when I was doing it"* Leo.
- *"It is more about me if I get confused and I want to relax"* Rose.

Facilities

Facilities were mentioned in previous research for enhancing accessibility for disabled people (Afacan 2012), however, there is no specific guidance on the accessibility features or their locations. The participants interacted with the facilities' activity through six maps. In general, it was observed that the participants tried to balance the distribution of each facility around the centre and across the different floors.

Restaurants and coffee shops: The participants added new coffee shops and restaurants across the three different floors. However, the third workshop did not introduce any additional coffee shops or restaurants. Rose highlighted that the coffee

shops should be situated on the perimeter and entrances, stating, “You need a coffee shop when you are walking in from the cold” (see Figure 7-24). These placements indicate a strong association between hospitality facilities and comfort, with participants demonstrating an intuitive understanding of how spatial positioning enhances usability and welcome.



Figure 7-24: Existing coffee shop/restaurant locations vs suggested locations added by the participants

Electronic maps: Two of the three groups proposed installing an electronic map on the lower floor, each aiming to ensure an even distribution across the centre’s floors.

Additionally, two groups selected closely situated locations for maps on the ground floor, with the shared goal of maintaining balanced spacing between the maps (see Figure 7-25). These suggestions indicate a clear understanding among participants of the value of accessible and logically distributed navigation aids in large, multi-level spaces.



Figure 7-25: Existing electronic maps locations vs suggested locations added by the participants

Information Desk: Although participants mentioned that maps can be useful, they emphasised the importance of an information desk, stating it can be more beneficial than a map, corroborating the findings of previous stages. Some participants were keen on locating an information desk at each entrance. Participants from different workshops selected the exact location for an information desk on the ground floor, while another pair chose very close locations for an information desk, as both were attempting to balance the distances between the information desks on the ground floor (see Figure 7-26). These consistent suggestions highlight the perceived importance of face-to-face support and participants' strategic thinking in ensuring equitable access to human assistance across the centre.



Figure 7-26: Existing information desk location vs suggested locations added by the participants

Seats: In locating seats, two groups had similar decisions on locating seats on the lower floor and an identical one on the ground floor. The third group added seats only to the ground floor, although it has the largest number of seats. However, they noted that these seats are usually busy, aligning with the walking interviews (see Figure 7-27). These choices reflect participants' prioritisation of rest points in high-traffic areas, underlining how crowdedness and availability influence perceptions of accessibility and comfort.



Figure 7-27: Existing seat location vs suggested locations added by the participants

Toilets: For the toilets, two groups added toilets on the ground floor. Two groups reported that the toilet on the lower floor was no longer functioning, and they requested its restoration. A participant noted that toilets should be located near entrances. Another noted that in addition to more locations, toilet opening times need to align with centre opening times (see Figure 7-28). These reflections highlight how both physical accessibility and operational reliability contribute to perceptions of whether a facility is truly usable.



Figure 7-28: Existing toilet locations vs suggested locations added by the participants

Other facilities: No group added any extra means for vertical connections (stairs, lifts and escalators). Only one group added extra facilities, which were charging points and drinking fountains. They located the charging points next to the seats, and they did not add any on the lower floor (see Figure 7-29). These additions demonstrate attention to everyday usability and comfort, suggesting participants were responsive to modern accessibility needs beyond traditional infrastructure.



Figure 7-29: Suggested charging points and drinking fountain locations.

Designing signs

Most participants chose distinct colours to differentiate between English and Welsh, with each language often allocated a unique, vivid colour to enhance clarity and visibility, echoing findings from earlier stages and previous literature (Castell 2012) (see Figure 7-30). Figure 7-30 shows a wide range of colour preferences across participants, including vivid hues like red, green, yellow, and turquoise. These preferences reinforce

the participants' desire for high visibility and easy navigation through colour-coded information.

Regarding text, four participants chose black and four chose other dark hues (e.g., dark blue or dark green), underscoring the critical importance they placed on legibility and clarity. These preferences reflect a shared understanding that high contrast between text and background is essential for making signage readable (see Figure 7-30), aligning with previous research (Castell 2012).

Beyond colour, participants provided additional recommendations about text design, consistently recommending large and readable fonts. The inclusion of international symbols, pictures was also suggested to support people who may be illiterate or have additional learning difficulties, aligning with the findings of the previous stages. Participants also emphasised the importance of avoiding jargon and designing signage that facilitates navigation for a range of disabilities, including sensory and cognitive differences. These insights align with and extend findings from the earlier stages.

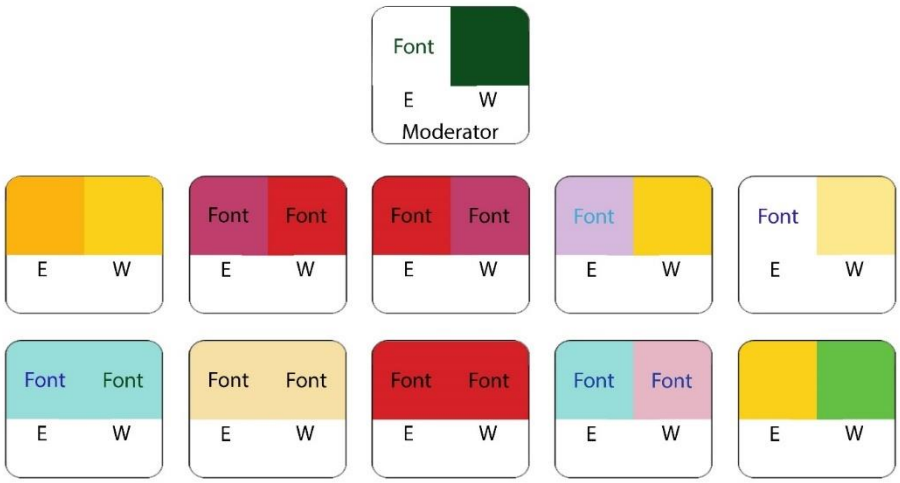


Figure 7-30: Signs colours for English and Welsh chosen by participants

Note: This figure only features ten participants as some participants left early across different workshops.

Conclusion

This chapter presented the final research stage, Co-design. Building on the validated findings from the focus groups, this phase presented participatory architectural solutions through a series of tailored workshops utilising creative methodologies. Although the previous research stages provided solutions, the workshops facilitated a deeper exploration of them, covering key areas such as the integration and placement of recovery spaces, the distribution of facilities across floors, and the design of inclusive signage.

It concluded with recommendations for designing recovery spaces, such as a central location, and recommendations for the facilities' locations, including balancing them across floors and accessible signs through large, clear fonts. Methodologically, the

workshops reaffirmed the critical importance of facilitation and personalisation of tasks. These insights not only enhanced the richness of this stage but also added further depth to the overall methodological framework. The next chapter synthesises the insights from the different research stages and contextualises them into the broader literature to articulate the final research contributions.

PRACTICE NOTE 3: HAMIDA

In this practice note, I reflect on my collaborative work with Hamida, the research facilitator who played a pivotal role in the research process. Building on the insights shared in Practice Note 1, where I discussed my experience as Hamida's Personal Assistant (PA) at the self-advocacy organisation, this note explores another aspect of our professional relationship. While Hamida was involved from the outset of the research, as outlined in Chapter 3, I have chosen to present this practice note towards the end to offer a reflective account of the various roles she undertook during the different stages of the research. This enabled me to capture the evolution of her contributions and the pivotal impact she had on shaping the research, particularly in terms of accessibility, inclusivity, and participant engagement.

Working with Hamida

Hamida's role was essential in ensuring that the research was both accessible and inclusive, guaranteeing that the voices of people with a learning disability were authentically represented throughout the study. Her involvement was vital in fostering an inclusive research environment, ensuring the accessibility of all processes, documents, and communications with participants.

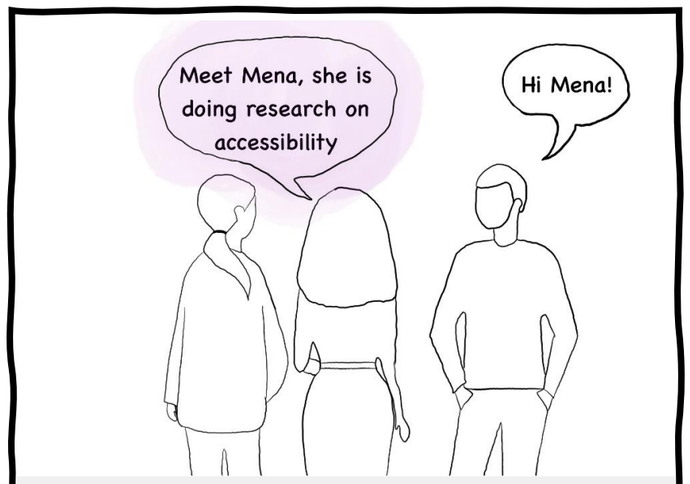
Her involvement aligns with the principles of inclusive research, highlighting the importance of involving people with a learning disability beyond mere participation (Walmsley 2001; Walmsley 2004; Strnadová et al. 2016; Walmsley et al. 2018; Strnadová et al. 2020). Hamida's role exemplified this, as her insider knowledge and lived experience were crucial in ensuring the accessibility of the research methods and creating a supportive environment for the participants. Her contributions significantly nurtured an atmosphere where participants could engage confidently on their own terms.

Her involvement had a profound impact on my understanding and approach to the research process. Her insights shed light on the often-overlooked barriers faced by people with a learning disability, prompting me to approach the research with greater empathy, cultural sensitivity, and a commitment to inclusivity. Hamida's deep connection to the community enabled her to effectively anticipate the needs of participants. This personal approach not only improved recruitment but also laid the groundwork for a trusting relationship, which was essential for the research's success.

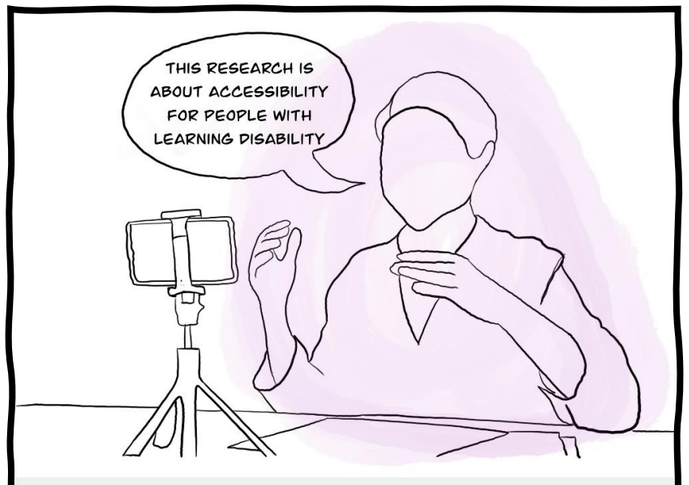
Having Hamida as a facilitator enriched the research in ways that extended beyond accessibility. Her position as an insider within the disability community enhanced the ethical integrity of the research by fostering a safe and supportive environment for participants. This trust enabled more candid and authentic data collection, as participants felt comfortable sharing their experiences openly, knowing they were supported by someone who truly understood their perspectives. Below, I review the multifaceted roles Hamida played throughout the research process, detailing her contributions and their significant impact on the study.



Engaging with the learning disability community can lead to a wide range of assumptions. Hamida helped me to address prejudice surrounding learning disability. Prior to the research, I had no previous relationship or experience with the disability community. Having her to guide, advise, and consult me was a significant step in overcoming this prejudice



Hamida assisted me in building rapport with the participants, who needed reassurance from a familiar face. She was a recognised figure within the community, fostering trust among the participants. Additionally, she consistently assured them about their privacy



She played a vital role as an accessibility officer. We discussed the research processes, and she offered advice on making it inclusive and friendly for participants. For example, converting the participant information sheet into a video and providing participation certificates



Before each research stage, Hamida facilitated the recruitment process. Being an insider made it easier for her to connect with and recruit participants. Furthermore, as noted in Practice Note 1, the experienced officers were well-acquainted with the members' preferences. As a result, the recruitment process was relatively smooth



Hamida was also a conversation facilitator. Although the language of all the materials presented to participants was simplified before the data collection, there were instances when participants struggled to understand the questions or tasks. At these moments, Hamida would intervene, providing explanations along with personal examples and reflections, which made the conversation more accessible



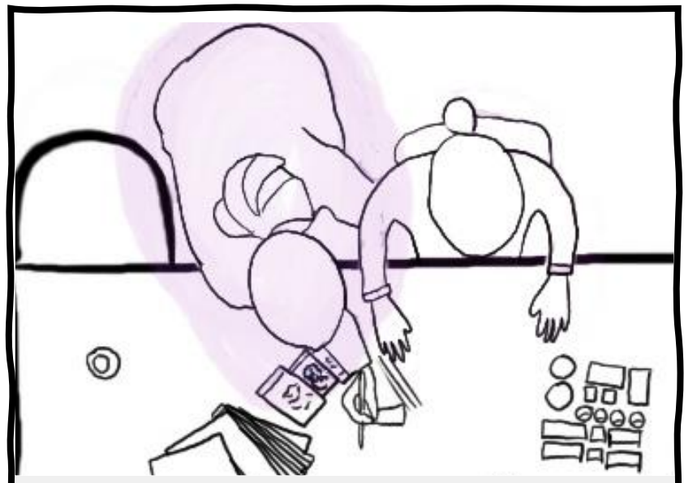
During the walking interviews, Hamida gave me a larger observation space, as she supported administering the questions while I stepped back to record observations, including the participants' interactions with the space and their confidence levels



Hamida also supported the pilot studies, helping me to practically capture any inaccessible features of the research process



During stages 3 and 4, Hamida also guided the participants to the venue. This may have been harder without her, as the venue location was not familiar to the participants. I would help by providing her with a list of the expected participants



Hamida also had a prominent role during the co-design workshops. She helped support the participants with limited motor skills. This highlights the importance of having more than one moderator and the value of prior acquaintance with the participants

My collaboration with Hamida was overall positive and instrumental in shaping an accessible and inclusive research environment. It is also important to reflect on the nuances and dilemmas that accompanied our working relationship. As both a researcher and Hamida's PA at various points, sometimes even on the same day, I had to consciously navigate the dual roles of supporter and academic, which occasionally raised questions about blurred boundaries and power dynamics. Although we worked collaboratively, the nature of solo doctoral study and single authorship meant that I held ultimate responsibility and control over the research narrative and outputs. These tensions prompted continuous reflection and a desire to ensure that her work was acknowledged meaningfully. In response, I always sought to include her in various dissemination and advocacy activities. For example, I invited Hamida to co-present our work on different occasions; she is also listed as a co-author in the Guide for Accessible Retail Spaces previously discussed in Practice Note 2.

Additionally, we have been working on a publication on the dynamics of our relationship during the research. These actions aimed to extend recognition beyond tokenism and toward a more equitable sharing of credit. Reflecting on our relationship has deepened my understanding of the ethical complexities of inclusive research and strengthened my belief in the value of co-production, not as a seamless process, but as one that demands transparency, humility, and ongoing negotiation.

Hamida's Reflections

The previous section outlined Hamida's critical role in facilitating this research from my perspective. However, it is equally important to understand her viewpoint on the process. Below is Hamida's reflection on her role and experiences expressed in her own words:

> *"Menna first approached [organisation name] via one of the group's many outings – Menna promoted the project verbally so that anyone interested in taking part got familiar with Menna, the project and its details. Menna then promoted a job opportunity for a person with lived experience with a learning disability. I was the privileged one who got chosen!*
>
> *I shared experiences, e.g., the best times, days of the week, and best ways to communicate with members. I was also given the chance to tweak the words, e.g., the consent forms, or do an explanatory video format of what the project is all about. There were incentives such as certificates and a one-off tea or coffee with cake or pastry at a café of the participant's choice as a thank-you for their time!*
>
> *I now appreciate and respect the architecture and different visuals everyone provided during each of their sessions. It feels lovely and important being part of a team alongside Menna, who will change the outcome of future architectural outcomes with lived disability experiences involved!"*

Hamida's reflections offer invaluable insights into the research, not just from a facilitator's perspective but also as someone with lived experience of a learning disability. Her words emphasise the importance of her role in bridging the gap between research and lived experience. Additionally, they highlight how research can either facilitate or impede the participation of people with a learning disability. Her unique position enabled her to provide critical feedback on the process, ensuring that the research was not only theoretical but also grounded in real-world experiences.

Conclusion

Reflecting on Hamida's role in this research underscored the impact that lived experience can have on shaping inclusive research practices. Hamida's insights into communication, recruitment, and data collection fostered an environment where participants felt safe, valued, and empowered to share their experiences. Through her guidance, I overcame my own biases and assumptions, gaining a deeper understanding of the subtle barriers faced by people with a learning disability. Her role as an insider within the community provided an ethical and culturally sensitive approach to the research, ensuring that the process was both inclusive and respectful.

8. Discussion

This chapter synthesises the findings of all the research stages and contextualises them with the existing literature.

Introduction

The preceding chapters 4, 5, 6 and 7 presented the different research stages; this chapter synthesises their findings. It begins with conducting a reflexive thematic analysis of the output from all research stages. Following that, it contextualises the results with the existing body of literature, discussing how the results align with, challenge, or expand upon the existing body of knowledge. These include previous official inclusive design guidelines, whether in general or specifically for people with a learning disability or neurodiversity regarding the architectural insights. While the methodological insights are contextualised within the learning disability related research across different disciplines.

The originality of this research stemmed from two main contributions. First are the methodological insights shaped by the personalised research process, and secondly, the architectural insights that examined the needs of people with a learning disability. Hence, this chapter is organised into two sections. The first section focuses on the methodological framework, critically analysing the participatory methods employed to actively involve people with a learning disability in the research process. This section addresses the first research question regarding the inclusion of people with a learning disability in architectural research. It reflects on the methodological outcomes and highlights enabling measures that can inform future research.

The second section explores architectural insights, focusing on both intangible and tangible aspects. Each theme in the architectural section comprises three components, each addressing a research question. First is how the theme emerged, which answers the second research question on how people with a learning disability experience and interact with buildings. Second, the challenges related to this theme, addressing the third research question regarding the architectural barriers faced by people with a learning disability. The final section involves identifying potential solutions to overcome these challenges, thereby addressing the final research question of design strategies that can make buildings more inclusive for people with a learning disability. Finally, the architectural insights section concludes with a synthesis of the relationship between the different themes.

Methodological Framework

Participatory research involving people with a learning disability is relatively underexplored in the field of architecture (Castell 2008; Park et al. 2020). Therefore, this study aimed to address this gap by actively involving people with a learning disability in the research process. As a result, the research provided methodological insights that can inform future architectural research involving people with a learning disability as well as other disciplines.

The participant-centred nature of this study was invaluable across all the research stages, enabling contributions that ranged from consulting on the selection of the case

study to suggesting enabling measures for research. This approach cultivated an inclusive research environment aligning with the current scholarly consensus highlighting the efficacy of inclusive research methodologies (Armstrong et al. 2019; Gjermestad et al. 2020). By prioritising the voices of people with a learning disability, this research aligned with current research directions advocating for greater autonomy and agency within disability studies (Walmsley 2001; Gilbert 2004; Tuffrey-Wijne and Butler 2010; Strnadová et al. 2016; Rojas Pernia and Haya Salmón 2021).

The participant-centred approach fostered a research environment that actively engaged with the participants lived experiences, ensuring that the findings accurately reflected their realities. Contrasting with traditional approaches in architectural research, which often rely on the perspectives of carers or medical professionals rather than directly engaging with the experiences of people with a learning disability (Emira and Thompson 2011; Castell 2012; Sherman and Sherman 2013; Casson et al. 2021; Hafez et al. 2021; Jebril and Chen 2021). The effectiveness of this approach is evident across various disciplines. For example, education (Rojas Pernia and Haya Salmón 2021), social sciences (Rojas Pernia and Haya Salmón 2021), care (Barr et al. 2003), technology (Sitbon and Farhin 2017; González et al. 2020), urban design and landscape (Cantarero-García et al. 2023) and transportation (Davies et al. 2010).

While the ideal scenario, as suggested by Walmsley (2001), advocates for complete control by disabled persons over every research facet, from funding to dissemination. The constraints of the doctoral study necessitated a more measured approach. However, this study achieved a solid level of inclusivity by actively empowering participants to contribute throughout the research process. This led to creative and impactful results, which were evident in previous research (Walmsley 2001; Gjermestad et al. 2020). For instance, participants provided valuable input on their personal coping mechanisms when faced with inaccessible environments. Although this was not a research aim, it deepened the understanding of the practical challenges they encounter within architectural spaces.

Analysis

Each research stage provided its own set of results, whether methodological or architectural. Reflexive thematic analysis was conducted throughout these insights through the six phases previously detailed in the Methodology chapter, Data Analysis section, as follows.

In the familiarisation phase, the researcher engaged with all the findings from all the research stages, highlighting the facilitator's crucial role in fostering meaningful participant contribution. Prompts were also a key insight, integral at all stages. In the code generation phase, several key codes emerged besides the facilitator role, such as personalising research tasks to participants' abilities.

During theme construction, methodological insights were grouped into three categories: Logistical, Technical, and Emphatical. Logistical covered planning and organisation; Technical related to data collection methods; and Emphatical focused on

relationship dynamics among participants, researchers, and facilitators. In the reviewing themes phase, the researcher refined insights by examining stage-specific themes to determine whether they should be merged or split. The final themes were clearly defined during the naming and definition phase, then integrated into a cohesive report in the writing phase.

Throughout the research stages, key themes such as facilitation, collaboration, employment, and prompts remained consistent. While some themes, such as carers and personalisation, appeared only at specific stages due to their unique nature. New themes also emerged during collective reflexive thematic analysis. These themes were grouped into the three categories, each of which is crucial for capturing participants' perspectives and ensuring successful recruitment and engagement (see Figure 8-1).

Figure 8-1 visualises the synthesis of methodological insights gained across the four research stages using reflexive thematic analysis. It maps the continuity and evolution of themes, identifies stage-specific themes (e.g., carers, personalisation) and illustrates how these insights coalesced into a comprehensive methodological framework.

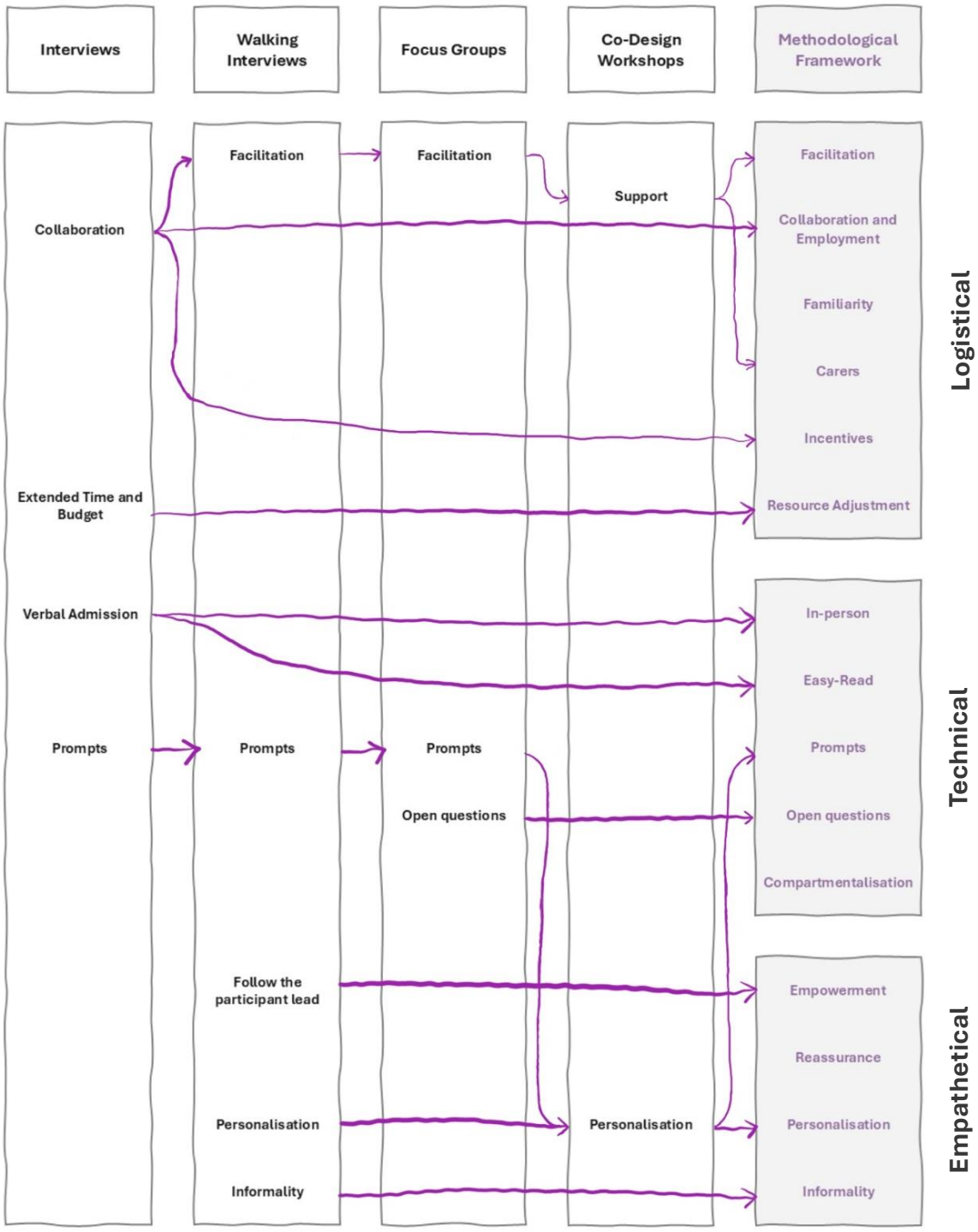


Figure 8-1: A visualisation of the reflexive thematic analysis for the methodological insights from the different research stages

Findings

The holistic themes represent enabling measures implemented throughout the data collection to ensure accessibility and inclusivity within the research environment. They were inspired by the participants, the facilitator, employment experience, and previous research. The details of the measures' implementation were outlined in the previous

chapters. The following Table 8-1 presents a summary of the enabling measures used in the research and lists their significance.

Table 8-1: Summary of enabling measures used in this research, their significance and position in the research stages

Enabling measure	Significance	Stage 1	Stage 2	Stage 3	Stage 4
Logistical					
1. Facilitation: employing a disabled facilitator	-Conversation mediator -Accessibility officer -Engagement advisor -Recruiter -Tackle prejudice -Building rapport	√	√	√	√
2. Collaboration and employment: with a self-advocacy organisation	-Enhanced recruitment -Building rapport -Deepened the understanding of the challenges faced by participants	√	√	√	√
3. Familiarity: conducting activities in familiar locations	-Reduced stress -Facilitated comfort and openness in discussions	√	√		
4. Carers: inclusion of support workers and carers	-Provided context for some insights -Provided support, especially for participants with lower physical mobility			√	√
5. Incentives: offering non-monetary incentives for participation	-Increases participant motivation -Participants felt valued	√	√	√	√
6. Resource adjustments: extended time and budget	-Non-rushed communication -Allowed the employment of the facilitator	√	√	√	√
Technical					
1. In-person: verbal admission and face-to-face interactions	-Facilitated a higher independence level for the participants -Building rapport -Allowed more observational space	√	√	√	√
2. Easy-Read: all participant-facing materials were in Easy-Read format	-Enhanced comprehension and independence among participants	√	√	√	√

Table 8-1 (continued)

Enabling measure	Significance	Stage 1	Stage 2	Stage 3	Stage 4
3. Prompts: using cue cards, activities and photos	-Kept the research process interesting -Simplified the complex ideas -Aided memory -Created a more casual atmosphere	√	√	√	√
4. Open questions: using open-ended questions	-Allowed expressive depth -Participants felt that their opinions were valued	√	√	√	√
5. Compartmentalisation: clustering different activities into different locations	-Organised and focused the workshop experiences -Supported fresh starts				√
6. Personalisation: accommodating tasks based on the participant's abilities	-Made the research less formal and, consequently, more approachable -Enhanced engagement		√		√
Empathetical					
1. Empowerment: prioritising participant voices and suggestions	-Enabled a higher independence level for the participants -Ensured their perspectives led the design of the activities	√	√	√	√
2. Reassurance: continuous reassurance and empathy about privacy and anonymity	-Reduced stress -Fostered a supportive research environment -Participants felt less stressed -Encouraged openness, securing trust and deeper insights	√	√	√	√
4- Informality: casual research interaction	-Enhanced engagement -Building rapport	√	√	√	√

Logistical measures

The logistical measures included employing a disabled facilitator, which the organisation recommended at the outset of the collaboration. This role was presented in the previous chapters and Practice Note 3. It ensured an inclusive research environment and helped the participants to share their insights more freely, which was evident in previous research (Gary et al. 2012). Previous research also noted the value of the deeper involvement of disabled people in research beyond traditional participation roles (Tuffrey-Wijne and Butler 2010; Gary et al. 2012; Strnadová et al. 2016; Armstrong et al. 2019).

The logistical measures also included collaborating with the self-advocacy organisation. While this collaboration initially aimed to support recruitment, it evolved significantly and continued beyond the completion of planned fieldwork activities. This collaboration occurred on two levels: first, the researcher commissioned the organisation as a recruiter, and second, the organisation employed the researcher as a workplace personal assistant, as previously detailed in Practice Note 1.

Both led to an enhanced understanding of the participants' accessibility needs by the researcher, which was evident in the number of recommendations during the preparation consultations of each stage. In the earlier stages, the recommendations were more extensive, while towards the end, they were less so. Highlighting the effect of implementing methodological insights arising from each stage on the next, and the researcher's enhanced understanding of the community needs.

This collaboration was invaluable in building rapport with participants, a key element in participatory research, especially when the researcher is an outsider to the target community. This aligns with previous research (Walmsley 2001; Tuffrey-Wijne and Butler 2010; Strnadová et al. 2016; Armstrong et al. 2019; Walmsley 2023). Moreover, regular interactions with participants outside of the research activities deepened the understanding of their challenges and needs. This ensured that the study was anchored in the real-world experiences of the learning disability community. It also heightened the relevance of the architectural insights, ensuring alignment with the needs and preferences of the target community, consistent with findings from previous research (Rojas Pernia and Haya Salmón 2021).

Logistical measures also included conducting the research activities in familiar locations, which made the participants feel at ease. The value of familiarity will be discussed in detail later in the architectural insights. However, this was not feasible at all stages of the research. When the activity was held in an unfamiliar place, this was compensated for with the presence of support staff, family members, and friends, which helped alleviate unfamiliarity, as mentioned. Unlike the first two stages, participation by support workers was allowed in Stages 3 and 4. The support workers provided context for some insights during the focus groups. During the workshops, they assisted the participants, especially during the hands-on activities, which aligns with the findings of previous research (Gaudion et al. 2015).

Another logistical measure was the provision of non-monetary incentives. During consultations with the facilitator, she recommended that participants receive non-monetary incentives to recognise and appreciate their time, effort, and contributions. The facilitator suggested providing participants with a participation certificate as a tangible acknowledgement of their valuable input into the research process. Such incentives are recognised in qualitative research as beneficial practices, promoting participation and conveying genuine appreciation without ethical concerns associated with monetary incentives such as influencing the response rate (Grant and Sugarman 2004; Head 2009). It is important to note that the facilitator received monetary compensation through employment. Such remuneration acknowledges the facilitator’s

critical role, professional expertise, and the substantial time investment required for meaningful involvement, which goes beyond volunteerism, tokenism or informal engagement.

The last logistical measure was resource adjustment; actively engaging people with a learning disability in the research necessitated adjustments to the research's initial resource allocation, which is typical in inclusive research where flexibility is crucial (Tuffrey-Wijne and Butler 2010; Strnadová et al. 2016; Rojas Pernia and Haya Salmón 2021). It also required time extensions to the preliminary research plan, which was also evident in previous research (Fudge Schormans et al. 2019).

Time adjustment initially aimed to avoid rushing the communication with the participants, following the literature recommendations (Gary et al. 2012; Mencap 2016; Fudge Schormans et al. 2019). However, it was also accompanied by unforeseen challenges. For example, some participants withdrew from activities due to insufficient support from their housing or last-minute changes to their schedules, which can be attributed to a lack of control over their daily activities, aligning with previous research (Emerson and Hatton 2008; Fudge Schormans et al. 2019). This was coupled with the fact that around 25% of people with a learning disability in England live in supported housing (Learning Disability and Autism Housing Network 2023).

Budget adjustments are also commonly cited in inclusive research projects (Tuffrey-Wijne and Butler 2010; Gary et al. 2012; Strnadová et al. 2020). This project required modifications to the original budget, for example, adjusting the budget to include the facilitator's expenses. This emphasises the need for careful planning and adaptability from the outset, echoing findings from past studies that inclusive research typically requires more resources, time, and involvement than conventional methods conducted solely by academic researchers (Walmsley et al. 2018).

Technical measures

The first technical measure was verbal admission and face-to-face interactions. This measure was inspired by Mencap recommendations on communicating with people with a learning disability, the researcher's experience through employment and the facilitator's recommendations (Mencap 2016). Conducting the activities in person provided a larger observation space and facilitated building rapport with the community.

Although the activities rarely relied on written materials, providing the participants with documents in Easy-Read format was beneficial for the participants who were curious and wanted to engage more with the research, which is the format recommended by different organisations (National Health Service England 2018; Mencap 2024). However, it was less vital than verbal admission.

The use of various prompts, such as cue cards and activities, helped overcome the formality of the research, supported understanding of the task, and aided memory. This was inspired by the recommendations of organisations and previous research (Gaudion

et al. 2015; Mencap 2016; Fudge Schormans et al. 2019). Another technical measure was using open questions, which allowed a bigger space for self-expression and reflection, following Mencap guidance on communicating with people with a learning disability (Mencap 2016). Consequently, the participants felt that their perspectives were valued, as many people with a learning disability relish the opportunity to be listened to (Gary et al. 2012). Another technical measure was compartmentalisation for the co-design workshops, where each activity had its designated zone in the workshop space to minimise confusion, promote fresh starts, and enhance focus.

Lastly, there were different levels of personalisation and flexibility in all stages. For example, the recruitment process supported different contact methods according to participant preference. Moreover, the researcher was flexible about the participants' schedules. For example, some research activities were conducted on weekends, resulting in increased participation. Additionally, most of the research activities were designed to be adaptable, for example, having more breaks and choosing the break location in the walking interviews. This aligns with recent findings that emphasise the need for flexibility in knowledge production with people with a learning disability (Gjermestad et al. 2020; Rojas Pernia and Haya Salmón 2021).

Empathetical measures

Empowering the participants by prioritising their voices was a vital empathetical measure, especially during stages 3 and 4 when support workers were invited to participate. Additionally, the design of the walking interviews depended mainly on following the participants' lead in a personalised manner, maximising their contribution space. Moreover, both the researcher and the facilitator ensured continuous assurance regarding privacy and anonymity during the different stages. This was inspired by the facilitator and was highly appreciated by the participants.

The last empathetic measure was informality, which was supported by casual interactions outside of research activities due to employment leading to building rapport with the community. As a result, many participants provided lengthy, detailed examples of their preferences and the barriers they encountered. This was also where the facilitator's role shone, as she reflected on her own experience, making it more relatable to the participants. The participants enjoyed long conversations during the breaks. Although those conversations might not have been directly related to the research topics, they helped build rapport between the researcher and participants, resulting in a substantial amount of qualitative data totalling over 1,500 hours of engagement, including employment. This is a result of some participants considering the researcher as a friend due to the familiarity that arose from employment. However, it is essential to acknowledge that dedicating over 1,500 hours to participant engagement was made possible due to the unique privilege of having an employment position that facilitated continuous informal interactions, which may not be replicable for professional research teams with different resource constraints.

These enabling measures, tailored to the needs and preferences of people with a learning disability, offer a framework that can guide future architectural research.

Researchers can create a more inclusive research environment by thoroughly addressing these methodological considerations. This approach not only enhances the engagement and contribution of disabled participants but also ensures that the resulting architectural insights genuinely reflect their needs and experiences.

Despite the study's strengths in fostering inclusive engagement, several practical and ethical limitations emerged that merit reflection. The participant sample was drawn primarily from individuals affiliated with a local self-advocacy organisation, meaning that participants were generally more ‘well networked’ and confident in group settings. This inevitably limited representation across the full spectrum of the community, particularly individuals with high support needs or limited verbal communication. The researcher’s dual role as both a familiar community member and a researcher also introduced challenges, as rapport and trust may have blurred professional boundaries, potentially influencing participant responses.

Additionally, some activities presented unforeseen dilemmas, such as raising hands for voting in the focus groups, which may also have encouraged groupthink. Furthermore, although stages 2 and 3 suggested that recovery spaces do not have to be a room, the design workshops consistently resulted in participants creating enclosed rooms. This outcome likely reflected the facilitator’s example, which may have inadvertently constrained participants’ imagination. Materials and colour choices available during the workshops may also have influenced design outcomes.

Architectural Insights

This section follows the same structure as the previous methodological framework section. Starting with the reflexive thematic analysis for the architectural insights throughout all the research stages, followed by the synthesised themes in the findings section, which contextualise the findings within a broad range of accessibility research. Inspired by the concept that frames inclusive design as simply “Good Design”, previously discussed in Chapter 2. It highlights that by addressing the needs of one group, the needs of other groups can be mutually addressed. However, the section also highlights the different needs between different groups, if any. Finally, this section reviews the synergy between the different architectural insights.

Analysis

To form the architectural insights, the datasets from all research stages, along with reflections from employment, underwent reflexive thematic analysis in the six phases previously detailed in the Methodology chapter, Data Analysis section. During familiarisation, the researcher identified common insights. A key theme was familiarity, which made participants feel more comfortable and confident. However, familiarity alone was not enough for accessibility, as participants still faced issues with wayfinding and sensory overload, even in familiar spaces. The presence of staff was also crucial, as it helped reduce unfamiliarity and assisted with navigation. Recovery spaces were vital for alleviating sensory overload, stress, and anxiety in public environments.

During code generation, codes captured participants' experiences, including wayfinding challenges, noting that familiar locations could be confusing due to poor signage, landmarks, or layouts. The need for recovery was also evident, highlighting preferences for private, quiet rooms to reduce sensory overload. During theme construction, codes were clustered into two categories: intangible and tangible insights. The distinction between intangible and tangible barriers emerged in the second research stage and was maintained throughout, as it was well-representative.

Intangible insights included social experience, holistic accessibility awareness, and communication. Tangible insights included wayfinding, facilities, and recovery. During review, themes were refined and merged, such as Recovery and Safety. In the naming and defining phase, the final themes were clearly articulated to capture their central concepts. During the writing phase, the researcher integrated insights into a cohesive report within the literature.

This holistic review of the architectural insights revealed that many themes, such as familiarity and wayfinding, had been apparent since the initial research stage. Conversely, other themes, including social experience and coping mechanisms, emerged only during a specific phase. While collectively reviewing the themes, similar elements, such as inclusive awareness and intersectionality, were consolidated. Notably, the co-design workshop did not introduce any new themes, which is understandable given its aim: to co-design solutions for the proposed themes; however, it offered an expanded understanding of the potential solutions (see Figure 8-2).

Figure 8-2 presents a visual synthesis of the architectural insights that emerged across the four research stages using reflexive thematic analysis. It traces the continuity of specific themes such as familiarity, wayfinding, and facilities, from the early interviews through to the co-design workshops.

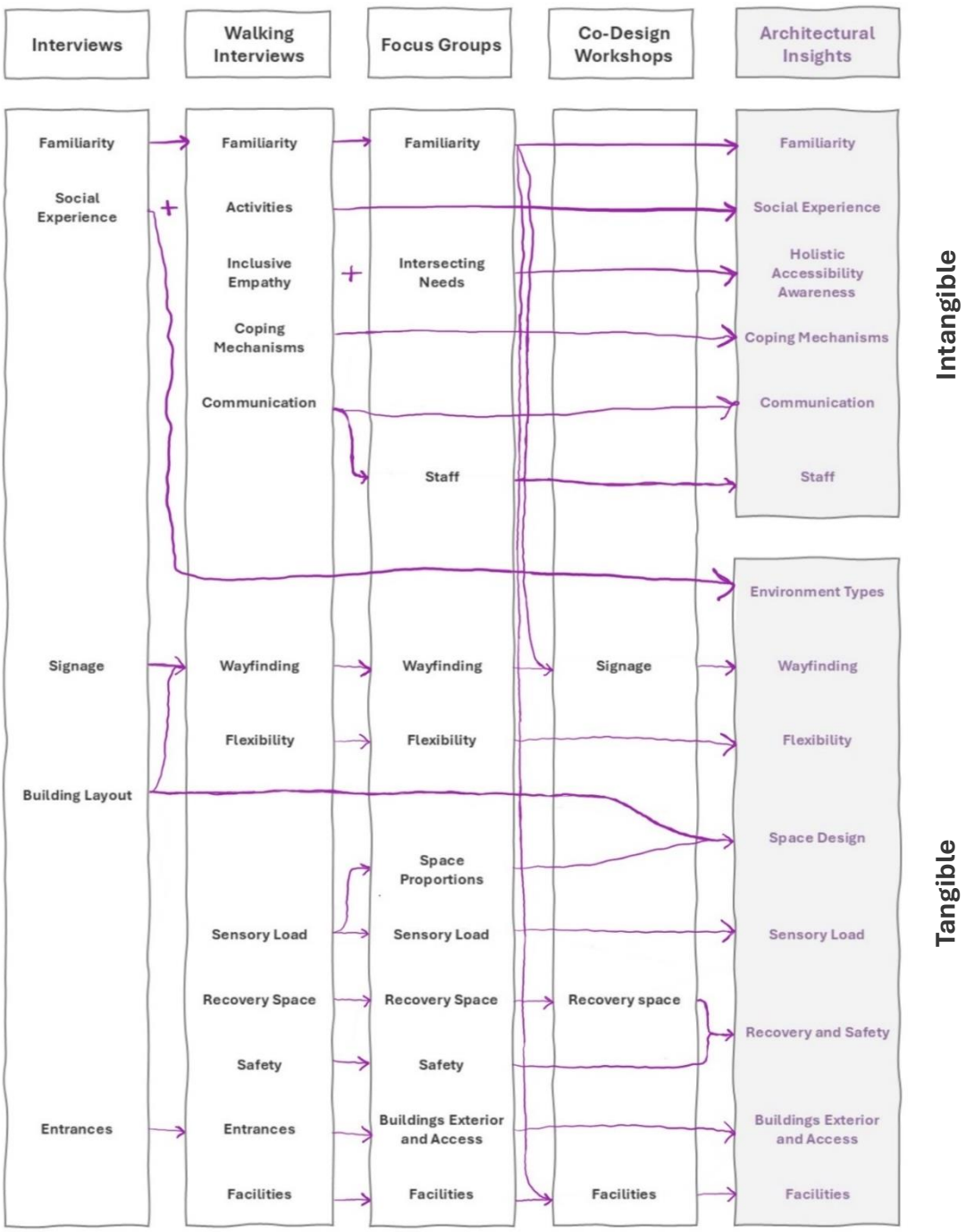


Figure 8-2: A visualisation of the reflexive thematic analysis for the architectural insights from the different research stages

Findings

This section reviews the synthesised architectural insights in a structured manner. Starting with how the theme initially emerged, followed by defining the theme and highlighting the barriers related to it and finally recommendations related to the theme. Consequently, answering research questions 2, 3, and 4 on how people with a learning disability experince buildings, what barriers they face in the built environment and what design solutions can be utilised to address these barriers.

Intangible insights

The intangible insights gained from this research offered a nuanced understanding of how people with a learning disability interact with the built environment, underscoring the intricate interplay between tangible structures and intangible social dynamics. Before examining the tangible aspects, this section summarises the intangible themes which extend beyond mere physical accessibility to tackle the broader social and attitudinal barriers that often marginalise disabled people, deeming them inferior or of lesser value (Imrie and Hall 2001). By situating these findings within the existing body of literature, this discussion reveals both alignments and deviations. The insights are presented from general perceptions, including familiarity, social experience, holistic accessibility awareness, and coping mechanisms, to more specific elements, such as communication and staff.

Familiarity

Familiarity emerged as a key theme throughout all the research stages. Nevertheless, the understanding of familiarity evolved throughout the stages. During Scoping, it became evident that participants preferred buildings with which they were familiar. Unfamiliar buildings frequently induce stress and anxiety. MacLennan et al. (2023) emphasised this issue, noting that unpredictability in unfamiliar environments presents a significant barrier for many autistic adults. Furthermore, Barr et al. (2003) noted that a lack of familiarity with local community facilities often undermines independence and confidence, leading to frustration and withdrawal from activities. However, the preference for familiar buildings was not absolute; some familiar buildings still caused stress for participants due to poor design or previous negative social experiences, which will be discussed further in the next section on Social Experience.

During Stage 2, familiarity was found to impact accessibility, but it did not guarantee complete accessibility. While most participants were frequent users of the Cardiff Metropolitan Shopping Centre (17 out of 18), some still abandoned their shopping trips due to various stressors. These stressors included unpredictable changes, navigation difficulties, and inadequate facilities. The adverse effects of unfamiliarity on people with a learning disability can be exacerbated if participants approach these buildings alone, without support from friends, support workers, or family members. Stages 2 and 3 also revealed that people with a learning disability tend to visit the same places rather than explore new ones, which aligns with the findings of Mathers (2008).

Later, during the focus groups, familiarity was discussed in detail, where participants translated it as factors related to accessibility, such as the availability of facilities, effective wayfinding, and a sense of safety. This viewpoint contrasts with the findings of MacLennan et al. (2022), who found that unpredictability was perceived by autistic individuals' with uncertainty regarding sensory environments, inconsistency across settings, and a lack of information. Despite these differences, both studies indicate that unfamiliarity can lead individuals to abandon their planned activities, such as shopping trips.

Recommendations for addressing unfamiliarity issues included both intangible and tangible suggestions. The intangible recommendations involved consulting with the community regarding changes, particularly major ones, and avoiding unannounced alterations. Furthermore, employment experience demonstrated that recorded walk-in videos could also assist in overcoming unfamiliarity, reinforcing the findings of prior research and guidelines (The British Standards Institution 2022; MacLennan et al. 2023). However, they may not be accessible to everyone, for instance, those who lack internet access.

Furthermore, many participants preferred company while visiting various buildings. This was a clear observation made during employment and resulted from stages 2 and 3. When visiting a new place, stress was alleviated by the presence of company, friends, family, or colleagues, which helped overcome the unfamiliarity. Notably, it can also help overcome other stressors, such as claustrophobia or sensory overload. However, this has not been extensively discussed in prior research, although Mathers (2008). highlighted that the support of staff in the preparation process before visiting a new place or conducting a new activity helps in overcoming unfamiliarity.

The tangible suggestions included maintaining consistent colours and materials across various stores of the same brand, which was not addressed in the previous literature. Additionally, the participants emphasised the importance of accessible wayfinding cues, such as maps, to alleviate unfamiliarity, which supports existing literature (The British Standards Institution 2022; MacLennan et al. 2023). Furthermore, fostering a perceived sense of safety, such as the presence of security cameras, alongside the overall maintenance of the building, also helps reduce unfamiliarity. Lastly, similar to this research, Mathers emphasised the significance of facilities in easing unfamiliarity (Mathers 2008).

Social experience

Social experiences affect how people with a learning disability interact with and perceive buildings, which resonates with existing research (Mathers 2008; Sherman and Sherman 2013). The fieldwork revealed that negative social experiences could deter individuals from visiting certain places and influence their perception of them, matching the findings of Mathers (2008). The social experience can overshadow accessibility. For example, a building might possess excellent accessibility features, yet if a person with a learning disability has previously encountered negative social interactions, they may choose to avoid it entirely. This highlights the importance of intangible elements in creating genuinely inclusive environments.

During the Scoping stage, some participants reported that schools were stressful environments due to experiences of bullying, which created lasting negative associations with these spaces. Similarly, hospitals were linked to anxiety and discomfort due to their association with illness and being unwell. Conversely, positive social experiences can greatly enhance perceptions of a building. For example, some participants enjoyed visiting museums, where they had positive interactions with staff

during various events. These uplifting encounters made the visits enjoyable, encouraged repeat visits, and fostered a sense of belonging and comfort.

To mitigate the impact of negative social experiences, staff should receive comprehensive training to understand and accommodate the needs of people with a learning disability. This aligns with earlier research findings and will be explored further in the Staff section. Furthermore, creating opportunities for positive social interactions can help counterbalance earlier negative experiences. For instance, organising inclusive events, providing support groups, and establishing safe spaces where people with a learning disability can engage positively with others can make a significant difference. Encouraging feedback from people with a learning disability regarding their social experiences can also yield valuable insights for continuous improvement, aligning with previous research (Vilnai-Yavetz et al. 2024).

Additionally, increasing community awareness about disability can foster a more inclusive and welcoming environment, mitigating the adverse effects of past negative social experiences. Unfortunately, learning disability is still associated with stigma due to the lack of awareness in society (Sherman and Sherman 2013). This contrasts with the attention given to other groups. For example, Cardiff Council committed to becoming Wales's first Neurodivergent Friendly City to ensure services remove the barriers neurodivergent individuals face in Cardiff (Cardiff Council 2023). Similar campaigns and strategies should be implemented for people with a learning disability. The positive effect of awareness was evident in previous literature. MacLennan et al. (2022) noted that the acknowledgement of autism has been shown to influence attitudes about it positively.

Holistic accessibility awareness

Stages 2, 3 and 4 revealed that people with a learning disability not only advocate for their accessibility needs but also the accessibility needs of disabled people in general. On several occasions, participants mentioned the needs of individuals with physical and sensory impairments. For example, participants would describe a space as inaccessible if it lacked a ramp or adequate space for wheelchair manoeuvring. This holistic awareness enriched the tangible architectural recommendations discussed later in this chapter.

To the best of the researcher's knowledge and based on the literature reviewed, this finding is a novel contribution, as it has not been discussed in previous literature. This empathetic perspective among participants may have stemmed from several factors. First, learning disability usually overlap with other disabilities. For example, adults with learning disability are 10 times more likely to be blind or partially sighted compared to the general population (The UK Practice and Development Team and RNIB Visual Impairment Learning Disability and Complex Needs Services 2015). Many participants had multiple disabilities, which potentially broadened their understanding and concern for a range of accessibility needs. This is not unique to learning disability but is prevalent across the disability community, with approximately 75% of disabled people experiencing more than one type of impairment (Sport England 2016).

Second, the social networks of people with a learning disability often encompass other disabled people. Previous research showed that disabled individuals frequently socialise with others who have similar or differing impairments. (Mathers 2008; Liu et al. 2018; Lee [no date]). This social interaction likely enhances their awareness and understanding of various accessibility challenges. Lastly, the empathy shown by the participants towards others may stem from their own lived experiences with disability, fostering a deeper appreciation for the broader spectrum of accessibility needs.

This suggests that accessibility is perceived as a comprehensive concept for disabled people rather than a fragmented perception. It challenges the conventional perspective that able-bodied individuals often hold regarding accessibility, which tends to focus primarily on a single impairment and especially physical impairments (Sherman and Sherman 2013; Castell 2014; Danso et al. 2017; Shuayb 2020). This highlights the importance of involving disabled people as accessibility experts in research, a practice well-supported by existing literature (Emira and Thompson 2011; Castell 2012; Gary et al. 2012; Sherman and Sherman 2013; Casson et al. 2021; Hafez et al. 2021; Jebril and Chen 2021).

Holistic accessibility awareness emphasises a crucial aspect of inclusive design, which considers the needs of all individuals. To address this aspect, the approach to accessibility ought to be transformed into a holistic strategy rather than an afterthought or a superficial remedy for visible disabilities. Recommendations for achieving this include involving diverse groups in the design process to gather a broad range of perspectives and needs, which aligns with the recommendation of the Inclusive Design Overlay to the RIBA Plan of Work (Royal Institute of British Architects 2023).

Furthermore, providing comprehensive training for designers and planners on inclusive design principles starting from undergraduate education can cultivate a more empathetic and effective approach to accessibility. Ultimately, policies and regulations should reflect this holistic approach, encouraging or mandating inclusive design practices that consider various abilities. This fosters a shift towards a more comprehensive perspective on inclusive design, aligning more closely with the reality that disabilities do not exist in isolation but often intersect and overlap.

Coping mechanisms

During stages 2 and 3, participants frequently discussed various coping mechanisms they employ to manage the challenges presented by inaccessible environments, which echoes findings from previous research on disabled people (Goodall 2010). These mechanisms are crucial in navigating inaccessible environments. Participants described strategies such as taking breaks outside the building or in nearby coffee shops or restaurants, turning off their hearing aids, covering their ears with their hands, or, in some cases, choosing to abandon the task or trip altogether. Similar coping mechanisms have been identified among autistic individuals (Manning et al. 2024).

Some participants preferred the company of others in crowded environments or during peak activity within the centre. The presence of a companion mitigated the

overwhelming effects of crowded spaces and provided a sense of security and support, akin to their role in overcoming unfamiliarity. However, it is essential to note that these coping strategies do not always lead to successful navigation of the space. Despite a companion's presence, the intensity of the sensory environment can still compel participants to withdraw from the activity. Additionally, people with a learning disability often plan their visits during off-peak hours to avoid the busiest times, demonstrating a proactive approach to managing this stress. This is also a strategy employed by autistic individuals (MacLennan et al. 2023). This planning underscores the limitations imposed on their independence and ability to participate freely in everyday activities.

The insights gained from these coping mechanisms are instrumental in guiding the development of inclusive environments. By minimising or eliminating the need for these coping strategies, designers and planners can create spaces that accommodate the needs of all users, promoting inclusivity and accessibility. These coping mechanisms can also serve to inspire creative design strategies (see Table 8-2).

Table 8-2: Coping mechanisms utilised by the participants and examples of design strategies inspired by them

Coping mechanism	Design strategy	
	Intangible	Tangible
Taking breaks outside the building	Encourage access to outdoor areas and advertise them in an accessible way	Design sheltered outdoor recovery spaces with clear visual and physical links to interior spaces
Taking breaks in nearby coffee shops/restaurants	Encourage partnerships with local hospitality venues for accessibility	Integrate quieter zones within hospitality venues' layouts, using soundproofing and spatial buffers
Turning off hearing aids	Provide quiet hours and sound-cancellation headphones	Create acoustically insulated, quiet rooms or zones within the building
Covering ears	Limiting music volume and avoiding unnecessary announcements throughout the day	Include designated sensory-friendly rooms or pods, strategically distributed throughout the building
Accompanied visits	Offer training for staff to assist individuals with diverse needs	Place visible, centrally located support/help desks or hubs in key areas for visitor assistance
Plan visits during off-peak hours	Communicate peak/off-peak times in accessible schedules	Implement digital sensory maps to indicate live occupancy and noise levels

Table 8-2 illustrated how designers may use coping mechanisms to inform their design decisions. Many of these strategies were discussed throughout the architectural insights, addressing other challenges as well.

Communication

The need for clear and accessible communication was prominent in stage 2 and throughout the subsequent research stages. People with a learning disability frequently encounter challenges in accessing key information due to the lack of accessible materials. The inability to access clear and understandable information can lead to increased stress and anxiety, which was highlighted by Mencap (Mencap 2016), potentially causing individuals to abandon shopping trips or other planned activities. This issue is particularly pronounced when it comes to changes, whether temporary or permanent, for instance, changes in opening hours or modifications in the built environment, which are often not communicated effectively to people with a learning disability (see Figure 8-3).



Figure 8-3: A major change in the centre was announced through one small notice in A4 size (identifiable information was redacted)

Communication challenges also include the lack of different communication versions and complex information, which agrees with previous research on accessibility for autistic people (MacLennan et al. 2023). Inaccessible communication methods also encompass online-only information, which may necessitate specific mobile applications or internet access. Even when such devices are utilised, the information can be challenging to locate or comprehend, as observed during employment, for example, using mobile navigation applications to navigate to new places. Consequently, many people with a learning disability prefer to visit the city centre for shopping rather than rely on online shopping options. Remarkably, while online communication can be a barrier for people with a learning disability, it is often more accessible for autistic people (MacLennan et al. 2023). Inaccessible communication

methods also include complex signs and inadequate distribution of information within buildings, which will be discussed in detail in the Wayfinding section.

To address these issues, several recommendations can be adapted. Changes must be communicated clearly and promptly to avoid confusion, which aligns with the recommendation of PAS 6463 regarding accessible communication for neurodivergent (The British Standards Institution 2022). Prioritising word of mouth is an effective strategy for conveying significant changes and key announcements, consistent with Mencap's suggestions on communicating with people with a learning disability (Mencap 2016). However, some autistic individuals benefit more from communication methods that do not rely on spoken language (MacLennan et al. 2023). These differing needs underscore the importance of diversifying communication methods to accommodate a broader range of users, a suggestion that is also applicable to enhancing communication with autistic individuals (Manning et al. 2024). This should encompass a range of formats, including flyers, in-store screens, banners, web communications, and mobile applications.

Additionally, using plain English and easy-to-read formats in all written communications is essential to ensure that information is accessible and comprehensible, as supported by the literature (Mencap 2016). Lastly, empowering floor staff to assist with communication can also significantly enhance accessibility, which will be discussed in detail in the following Staff section.

Staff

This need for well-trained floor staff was evident during stages 2 and 3. The presence of support staff, friends, or family members can help people with a learning disability overcome both tangible and intangible barriers in the built environment. Since one of the goals of this research was to promote independence, the availability of trained floor staff can significantly contribute to this by increasing the confidence of people with a learning disability in navigating buildings independently, without the need to rely on friends or family members. This aligns with existing literature, which highlights the importance of trained staff in supporting autistic people (MacLennan et al. 2023).

The importance of providing trained staff stems from the fact that people with a learning disability often prefer to seek assistance from staff or security personnel rather than approach a random person. This preference may be due to shyness, lack of confidence, or concerns about stereotypical perceptions related to learning disability, which was clear in the walking interviews. This aligns with the previous literature regarding stigma as an invisible barrier (Abbott and McConkey 2006; Emerson and Hatton 2008; Hall 2010; Sherman and Sherman 2013; Boys 2014; Hassanein 2015; Scior and Werner 2015; Mencap 2022a). Stigma and lack of understanding as a barrier were also reported by autistic individuals (MacLennan et al. 2023).

Trained floor staff can play a crucial role in mitigating various challenges by providing navigation support, assisting with wayfinding, and directing individuals to necessary services and facilities. They also contribute to a perceived sense of safety and

maintenance within the environment. Recommendations for improving staff support include comprehensive training programs that focus on empathy, effective communication, and strategies for assisting people with a learning disability. This was also recommended by Manning et al. (2024) to enhance accessibility for autistic people.

While the presence and training of floor staff are not directly architectural, the design implications may involve creating an environment that supports their effective visibility and availability. Noting that the participants highlighted the lack of staff during stage 3. Architectural strategies could include ensuring clear lines of sight within buildings, strategically positioning staff stations or information desks at regular intervals and critical decision-making points, and integrating architectural elements such as clear signs and landmarks, which will be discussed in detail in the wayfinding section. These strategies would facilitate easier and more intuitive access to support, enhancing the independence and confidence of users. The detailed architectural recommendations explicitly related to the information desk are discussed further in the facilities section.

Tangible insights

The following themes represent an evolution of insights that emerged at various stages of the research, progressively refining the understanding of how architectural design can better accommodate the needs of people with a learning disability. It acknowledges their right to equal access to core buildings and services such as healthcare, education, and employment, as well as to leisure facilities and services. Through the discussion of these themes, it becomes evident how they overlap and connect with each other, as well as the previously mentioned intangible themes. The insights are presented from general perceptions, including: environment types, wayfinding, flexibility, space design, sensory load and recovery and safety, to more specific elements, including: building exterior and access and finally facilities.

Environment types

The first research stage, Scoping, revealed that specific environments can be more stressful for people with a learning disability, highlighting the need for further inclusive revisions. However, it is important to note that these insights are not solely based on the physical environment but are also influenced by intangible factors. Similarly, some of these findings may be subjective or specific to a particular building in Cardiff. While social experience and familiarity were some vital decisive factors for categorising accessible buildings for people with a learning disability, the crucial decisive factor for autistic individuals was sensory load (MacLennan et al. 2023).

Participants perceived educational environments, such as schools, universities, and libraries, as stressful. Schools were linked to negative memories of bullying, resulting in an overall aversion. In contrast, universities felt unfamiliar and, therefore, unwelcoming to participants who had never attended one. This aligns with McClimens et al. (2014) findings, in which a participant noted that they had never entered a university building because they believed they were not allowed to. Libraries were described as overwhelming due to their complex layouts, making navigation difficult.

Similarly, previous research for autistic individuals highlighted that educational buildings can be disabling (Mostafa 2021; The British Standards Institution 2022; MacLennan et al. 2023). PAS 6463 indicated that educational spaces could present barriers due to the density of people and the high concentration required for study, compounded by the difficulty in escaping to quieter or restorative spaces, given the formal structure of lessons, which contrasts with the results (The British Standards Institution 2022). Mostafa (2021) reasoning also contrasts with this research as she highlighted that the barriers in university can be attributed to social, educational and sensory challenges.

Equally, civic buildings, such as community halls and hubs, also received negative feedback, with participants finding their layouts confusing. However, no specific mention of hubs was made in the literature reviewed. Conversely, cultural buildings such as historical sites, museums, and theatres were generally well-received. For example, Cardiff Castle was a familiar and frequently visited location for many participants, which positively influenced their perception. Museums were also popular, largely due to regular, positive interactions with them through various activities. The accessibility and frequent visits, whether planned or unplanned, were coupled with free entry to these museums. This is consistent with the opinions of autistic individuals on cultural buildings (MacLennan et al. 2023). However, this conflicts with PAS 6463, which noted that arts and cultural buildings can be challenging environments (The British Standards Institution 2022).

Stadiums also received positive responses, particularly from participants who regularly attended sports events. This aligns with some aspects of previous research with autistic individuals (MacLennan et al. 2023). The familiarity and enjoyment associated with these environments contributed to the overall positive experiences reported. Although they are considered loud and crowded places, the fact that users are prepared for this sensory overload beforehand helps to alleviate their inaccessibility.

Retail environments, including shopping centres and stores, also garnered positive feedback. Conversely, BS 8300:2 noted that retail environments present some retail-specific challenges for some people (The British Standards Institution 2018). Echoing MacLennan et al. (2023) findings that shopping centres and retail environments can be challenging for autistic individuals.

Coffee shops and restaurants were also favoured by the participants, who frequently visited the same places, underscoring the significance of familiarity. This corresponds with McClimens et al. (2014) who observed that people with a learning disability often choose coffee shops when financially viable. However, this contrasts with MacLennan et al. (2023) findings that restaurants and coffee shops can be challenging for autistic individuals. BS 8300-2 also note that background noise in restaurants and coffee shops can be challenging, especially for people with hearing impairments and people with sensory/neurological processing difficulties (The British Standards Institution 2018).

Employment observations revealed that eating out, having a coffee, shopping and window shopping are staple daily activities for people with a learning disability. Many people with a learning disability may visit the City Centre daily, not only for shopping but also for socialising, consistent with previous research (McClimens et al. 2014). Many of them considered these activities as leisure activities as their weekly routine is often unchanged for years or decades, which may focus mainly on attending Day Services and work placements with their learning- disabled peers (Mathers 2008), increasing the importance of accessibility in shopping and hospitality environments.

Wayfinding

Research stages 2, 3 and 4 consistently highlighted the challenges people with a learning disability face in navigating buildings, which aligns with previous literature on accessibility for people with a learning disability and autistic individuals (Salmi 2007; Castell 2012; The British Standards Institution 2022). Unclear signage can lead to confusion and frustration, often causing individuals to abandon their efforts to reach a destination. This aligns with previous literature on wayfinding for people with a learning disability (Salmi 2007; Castell 2012).

Accessible wayfinding is crucial for people with a learning disability, as it enhances their sense of independence. Some people with a learning disability may feel shy or lack confidence in asking for directions. Consequently, without clear signs, they may continue searching aimlessly, leading to increased physical and emotional stress and dependency. Effective, predictable wayfinding is not only necessary for reaching specific destinations but is also essential for accessing important facilities, such as toilets, recovery areas, or exits, when the environment becomes overwhelming.

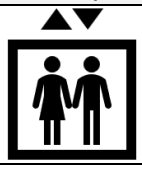
It is essential to incorporate various wayfinding cues to create environments that are easier to navigate. This diversification was recommended by previous research regarding accessibility for people with a learning disability and autistic individuals (Salmi 2007; Castell 2012; The British Standards Institution 2022). Landmarks can be effective in supporting navigation, such as sculptures, fountains, memorable wall features or art pieces, an insight also noted in the literature (Castell 2012; The British Standards Institution 2022). In the case study building, which lacked prominent landmarks, participants relied on alternative features such as favourite shops, major stores, and escalators to orient themselves and describe their location, especially during the wayfinding activities. PAS 6463 also mentioned that escalators can be used as landmarks (The British Standards Institution 2022).

Previous research highlighted that maps can be problematic for people with a learning disability. Hence, they need to be simplified and aided with symbols, “you are here” locators and colour coding (Salmi 2007; Castell 2012). However, during the walking interviews, participants' abilities to read and interpret maps varied widely. Thus, it is recommended to diversify the wayfinding aids to support various abilities.

Wayfinding cues, such as maps, signs, and directories, should include specific features to enhance accessibility and usability. These features can be categorised into placement and distribution, design and visual, and functional and navigational aspects.

1. **Placement and distribution**
   - Well-distributed: Signage should be placed strategically throughout the building, especially near entrances and key junctions. This supports existing guidelines (The British Standards Institution 2018; The British Standards Institution 2022)
   - Signs level: Signs should be placed at or near eye level to ensure users do not overlook them.
   - Contextual visibility: Signage should stand out from surrounding commercial signs and be easily distinguishable, reinforcing the recommendations of previous research and guidelines (Castell 2012; The British Standards Institution 2018; The British Standards Institution 2022).
   - Multiple levels of signage: Signs should be located at different levels to direct, confirm, and assure users as they navigate, consistent with PAS 6463 (The British Standards Institution 2022).
2. **Design and Visual Features**
   - Easy-Read format: Signage should use simple language without jargon, have clear instructions and short descriptions, and include symbols or pictures to accommodate varying levels of literacy. This matches the recommendations of previous research and guidelines for disabled people and autistic individuals (Castell 2012; The British Standards Institution 2018; Mostafa 2021; The British Standards Institution 2022). Moreover, only standardised symbols should be used; if no standardised symbols exist, photos or clear symbols should be used. When photos are used, they should have a clear background and good colour contrast and should not be cluttered (see Table 8-3). In line with the recommendation of previous research and guidelines (Castell 2012; The British Standards Institution 2018).

Table 8-3: Examples of aiding signs with standardised symbols or photos

Examples of standardised symbols			Examples of photo aids		
					
Lift	Toilets	Restaurant	Eggs section	Make-up/ beauty section	Bakery section

   - Bilingual clarity: If signage is bilingual, there should be a clear distinction between languages using different colours or separate signs. This was not previously highlighted in research but emerged in the results due to the geographical context.

- Multi-disability support: Signage should accommodate different abilities, such as visual or hearing impairments, aligning with the holistic accessibility awareness theme previously discussed. This was also recommended by PAS 6463 and BS 8300-2 (The British Standards Institution 2018; The British Standards Institution 2022).
- Large print: Signs should feature large print that is both easily readable from a distance and accessible to people with visual impairments. Which parallels earlier recommendations (Castell 2012; Mostafa 2021).
- Good colour contrast: Effective colour contrast between the sign background and font to enhance visibility and legibility, consistent with previous findings (Castell 2012).
- Lighting: Signage should be well-lit to ensure visibility, especially in dimly lit areas. Good lighting was not directly mentioned in the literature; however, it was highlighted that the position of signs should avoid glare (Castell 2012; The British Standards Institution 2018).

3. **Functional and navigational features**
   - Directional clarity: Signs should feature clear directional arrows that differentiate between directions, such as "straight ahead" versus "upstairs" (see Figure 8-4).

Sign		
Intended meaning	Straight ahead	Upstairs
Perceived meaning by people with a learning disability	Upstairs	Upstairs

Figure 8-4: Example of the complexity of directional arrows for people with a learning disability

- Navigating floors: Floor numbers with a brief directory should be clearly visible and accessible near the stairs and escalators, both inside and outside the lifts. Reinforcing prior recommendations of BS8300-2 (The British Standards Institution 2018). Moreover, lifts can be provided with both visual and auditory systems to announce the floor number, as some participants were confused about when to leave the lift during the walking interviews. This aligns with the recommendations of Part M (The United Kingdom Government 2024).
- Signposting support: Maps should include a “You Are Here” locator to help users orient themselves, congruent with the recommendations of previous research and guidelines (Salmi 2007; Castell 2012; The British Standards Institution 2018; Mostafa 2021).
- Variety of sign types: To cater to diverse needs, different sign formats such as wall signs, pop-up signs, digital signs, and floor decals should be incorporated.

Flexibility

Throughout stages 2 and 3, participants repeatedly emphasised the importance of flexibility in architectural design. They strongly preferred having various options available, as they associated this with greater independence and control over their environment. This resonates with existing literature for people with a learning disability and autistic individuals (Mathers 2008; MacLennan et al. 2023).

Flexibility was highlighted as essential in both the tangible and intangible aspects of the built environment. Intangible flexibility encompasses a range of payment methods, including cash, card, and contactless options, which cater to diverse preferences and varying levels of technological confidence. Employment experience has shown that most people with a learning disability rely on cash in their daily transactions, which makes contactless payments a barrier for them, especially with the increase in contactless payments following the COVID-19 pandemic. Interestingly, this contradicts the findings of Borowski-Beszta et al., who noted that contactless payment can be utilised to empower disabled people (Borowski-Beszta et al. 2023). However, their research sample was limited to internet users, and insights from this research showed that many people with a learning disability rarely use the internet.

Participants also highlighted some tangible flexibility options, for example, a variety of seating options, which will be discussed in the Facilities section. Similarly, the diversification of wayfinding cues aforementioned enhances navigational ease for all users, acknowledging the different ways individuals process spatial information. Further elaboration on how flexibility is integrated into recovery spaces will be explored in the subsequent Recovery and Safety section.

Participants also highlighted the importance of options for vertical connections, as they may use a mix of them. During the walking interviews, the most used vertical connection was escalators, although some were not confident in using them, followed by lifts. Notably, the escalators in the centre are located in high-traffic areas. Moreover, participants highlighted that the locations of the lifts can be unclear, and some found them claustrophobic. There was no mention or use of the stairs during the walking interviews, as their locations are peripheral. However, the employment observations showed that people with a learning disability use lifts and stairs almost equally, with lifts being mostly used by individuals with limited physical mobility.

Flexibility is critical, as inclusive design for individuals with a learning disability is a relatively new and evolving field. Designers are not yet certain what works best for them. Disabled people communicate their needs and challenges to designers, suggesting potential solutions. However, it remains the designers' responsibility to create suitable solutions that stakeholders can test, thereby informing the subsequent design process.

Space design

The complexity of the building's layout was identified as a barrier during stage 1, while the scale and design of the spaces were evident throughout all the research stages. This complex layout affected perceptions of accessibility, resulting in confusion, which

aligns with previous research (Salmi 2007). Regarding scale, an overly intimate scale can create a claustrophobic feeling, while a monumental scale may be intimidating, leading people with a learning disability to feel overwhelmed. Accessible layouts should avoid both extreme scales, monumental and intimate. Hafez et al. (2021) noted that space proportions significantly affect the feelings of their users, especially people with a learning disability. Therefore, a human scale is recommended as it promotes a more inclusive and comfortable environment.

Additionally, combining different scales by varying ceiling heights can be effective, as this approach was positively noted during the walking interviews. Utilising ceiling height variation parallels PAS 6463, as a lower ceiling creates a more intimate and quiet space. Results also agreed with PAS 6463 in providing generous open spaces where possible (The British Standards Institution 2022).

Sensory load

Sensory overload emerged as a source of stress during stages 2 and 3. Among the various sensory factors, lighting, acoustics and touch were the most concerning for people with a learning disability, which corroborates existing literature on learning disability and autism (Castell 2012; Mostafa 2014a; Mostafa 2014b; The British Standards Institution 2022; Manning et al. 2024).

- Visual

Bright or flashing lights, glare, and reflections were reported as overwhelming. Additionally, repetitive and complex visual patterns contributed to feelings of distress. To manage visual sensory load, it is recommended to prioritise natural lighting wherever possible using windows and skylights. Echoing the recommendations of previous guidelines for autistic individuals (Mostafa 2021; The British Standards Institution 2022). However, glare and distraction should be controlled, which aligns with previous literature and guidelines (Castell 2012; The British Standards Institution 2018; The British Standards Institution 2022)

When artificial lighting is necessary, indirect lighting should be utilised, with the option to control its colour and intensity consistent with ASPECTSS 2.0 recommendations (Mostafa 2021). Regular maintenance of artificial lighting is essential, as flickering or blurry lights can increase stress levels. Managing glare and reflections is equally vital whether in natural or artificial lighting, requiring careful selection of non-reflective materials to reduce visual discomfort, resonating with recommendations of BS 8300-2 (The British Standards Institution 2018).

Colours and decorations within the building should be used thoughtfully to create a balanced environment. While vivid colours can add variety and counteract monotony, they should be applied in moderation. These elements can also reinforce the identity of different spaces, such as through branding, as discussed in the Familiarity section. Colours can further serve as landmarks and aid in wayfinding and navigation. However, complex and repetitive patterns should be avoided to prevent visual discomfort, in line with PAS 6463 recommendations (The British Standards Institution 2022).

Another suggestion is to integrate biophilic design principles, which encapsulate the innate human desire to connect with nature (Kellert et al. 2008). This theme, subtly noted during walking interviews, became more prominent in stages 3 and 4. Biophilic design can be implemented at various scales, such as integrating outdoor spaces into layouts, natural colours and materials and nature-inspired decorations, such as indoor plants (see Figure 8-5). Previous guidelines recommended using colours that are in abundance in nature, such as greens and light, warm, neutral colours, as they are soothing and should be used on surfaces which might be in view for longer periods of time (Mostafa 2021; The British Standards Institution 2022), which aligns to some extent with the findings of stage 4.



Figure 8-5: Examples of nature-inspired decorations used in the centre, which were favoured by the participants

- Auditory

Unpredictable noise, whether from crowds or announcements, heightened anxiety. To mitigate audio overload, sound-reflective materials should be avoided, as they can amplify noise and create echoes, which can also be confusing for people with visual and hearing impairments, as noted by PAS 6463 (The British Standards Institution 2022).

When noise cannot be avoided, providing recovery spaces and offering quiet hours can help individuals recover from sensory overload, which affirms earlier recommendations (The British Standards Institution 2018; The British Standards Institution 2022; Manning et al. 2024; Vilnai-Yavetz et al. 2024), a topic that will be explored in more detail in the following Recovery and Safety section.

- Touch

Crowds are another sensory concern, as they can be stressful and overwhelming, often prompting people with a learning disability to leave the building. This was also a barrier for autistic individuals (The British Standards Institution 2022; MacLennan et al. 2023). Thus, spaces must be sufficiently designed to facilitate comfortable circulation, thereby reducing the likelihood of physical contact and invasion of personal space, which can lead to increased stress and anxiety.

To minimise the impact of crowds, participants suggested implementing strategies such as a one-way traffic system, separating entrances and exits and designing wide

pathways to facilitate movement and reduce congestion. In situations where crowds are unavoidable, it is crucial to provide recovery spaces. These can be indoor or outdoor; if indoor recovery areas are not feasible, it is advisable to establish a connection to outdoor spaces.

Additionally, prioritising open layouts over confined, cluttered spaces can help alleviate the stress caused by crowds; for example, avoiding low ceilings and implementing wide aisles and low shelving can further support this concept by making spaces feel more accessible and less overwhelming, echoing the Sensory-Inclusive Supermarket Guide (Manning et al. 2024). In addition to the Space design consideration previously mentioned.

Recovery and safety

There was a unanimous consensus on the need for a space to recover in stages 2, 3 and 4. People with a learning disability often require opportunities to recover from various stressors within the built environment. This matches findings from prior inclusive guidelines (Mostafa 2014a; Mostafa 2014b; Technical Committee B/559 2018; The British Standards Institution 2022; MacLennan et al. 2023). Without the ability to recover, people with a learning disability may feel compelled to leave or abandon tasks altogether. Recommendations for fostering recovery include both intangible and tangible solutions.

Intangible recommendations include establishing quiet hours with various time slots, including mornings, afternoons, and evenings across weekdays and weekends, aligning with previous recommendations (The British Standards Institution 2022; Vilnai-Yavetz et al. 2024). If quiet hours are not feasible, offering a schedule that highlights less crowded periods can help users with a learning disability plan their visits during calmer times. Effective communication of these options is essential, as discussed previously in the Communication section.

Tangible recommendations to foster recovery include providing designated areas for recovery. Ideally, multiple recovery spaces should be available to cater to different needs, which aligns with the recommendations of PAS 6463 (The British Standards Institution 2022), such as a combination of indoor and outdoor areas. Where a dedicated room is not possible, alternative options like a bench in a quiet corner or outdoor seating can serve as a substitute. Recovery spaces should include specific features to ensure their accessibility (see Figure 8-6). These features can be categorised into three categories: privacy and accessibility, sensory environment and materials and furniture.

1. **Privacy and Accessibility**
    - Privacy and security: Spaces should offer a sense of privacy and security, which can be managed by the building operations team. An occupancy indicator could be provided for those who prefer solitude. Which corroborates the recommendations of PAS 6463 (The British Standards Institution 2022).

- Proximity to facilities: Recovery spaces should be conveniently located near essential facilities, particularly toilets and hospitality spaces.
- Universal access: Spaces should include features that support individuals with wide spectrum of needs, aligning with the holistic accessibility awareness concept mentioned earlier. For instance, sufficient space should be available for wheelchair users, which was not explicitly emphasised in the reviewed literature.
- Central location: The recovery space should be located centrally within the building, ensuring easy access from various areas and a stress-free journey to the space, allowing users to continue their journeys smoothly. Affirming the recommendations of PAS 6463 (The British Standards Institution 2022).
- Effective communication: Signage leading to the recovery space should be clear and simple, with additional banners around the building and information about the space available on websites or mobile applications, accompanied by photos to enhance predictability.
- Non-claustrophobic space: The recovery space should be large enough to comfortably accommodate at least two people, allowing for the presence of caregivers, friends, or family members (see Figure 8-6). Resonating with the guidelines of PAS 6463 (The British Standards Institution 2022).



Figure 8-6: Top view of Leo's recovery space, where he arranged the room to accommodate more than one person

2. **Sensory environment**
    - Natural lighting: Natural light should be prioritised through windows and skylights while avoiding glare by providing controllable blinds (see Figure 8-7). Consistent with the recommendations of PAS 6463 (The British Standards Institution 2022).



Figure 8-7: Top view of Summers's recovery space, where she chose a full skylight ceiling

- Connection to outdoors: Recovery spaces should be linked to outdoor areas, either through windows, skylights, balconies, or direct access to parks or seating areas within the public realm. Echoing the recommendations of designing a recovery space for autistic individuals (Mostafa 2021).
- Controllable lighting: Artificial lighting should be adjustable in both colour and intensity, allowing users to customise the environment to their needs. Which aligns with the guidelines of PAS 6463 (The British Standards Institution 2022).
- Quietness: Recovery spaces must be shielded from noise, both from the busy centre and from mechanical, electrical, or plumbing systems. Congruent with the recommendations for designing recovery space for neurodiversity (Mostafa 2014a; Mostafa 2014b; The British Standards Institution 2022; MacLennan et al. 2023).
- Sensory features: Controllable sensory elements, such as sensory lights, projectors, or sounds, should be incorporated (see Figure 8-8). Additional sensory aids, such as fidget toys, noise-cancelling headphones, or weighted blankets, can also be provided.



Figure 8-8: Top view of Amelia's recovery space, where she chose a whole wall as a projector screen featuring a sea landscape

3. **Materials and furniture:**
    - Comfortable and flexible furniture: Informal, home-like furniture, such as bean bags, should be accessible to promote a relaxed environment (see Figure 8-9). Spaces may also include movable or adjustable furniture, allowing users to adjust it as needed, which aligns with the Flexibility theme previously discussed. Resonating with existing guidelines for designing recovery space for neurodiversity (Mostafa 2014b; Mostafa 2014a; The British Standards Institution 2022).



Figure 8-9: Top view of Daniel's recovery space, where he arranged the furniture in a home-like setting, adding a TV and a bean bag

    - Nature-inspired designs: Natural materials, colours and elements should be used, including wooden furnishings with nature-inspired hues for walls and flooring. Incorporate plants or views of nature to create a calming atmosphere, matching the recommendations of PAS 6463 (The British Standards Institution 2022).
    - Materials: Light and sound reflective materials should be avoided, in addition to avoiding non-slippery floors, consistent with the recommendations of PAS 6463 (The British Standards Institution 2022).

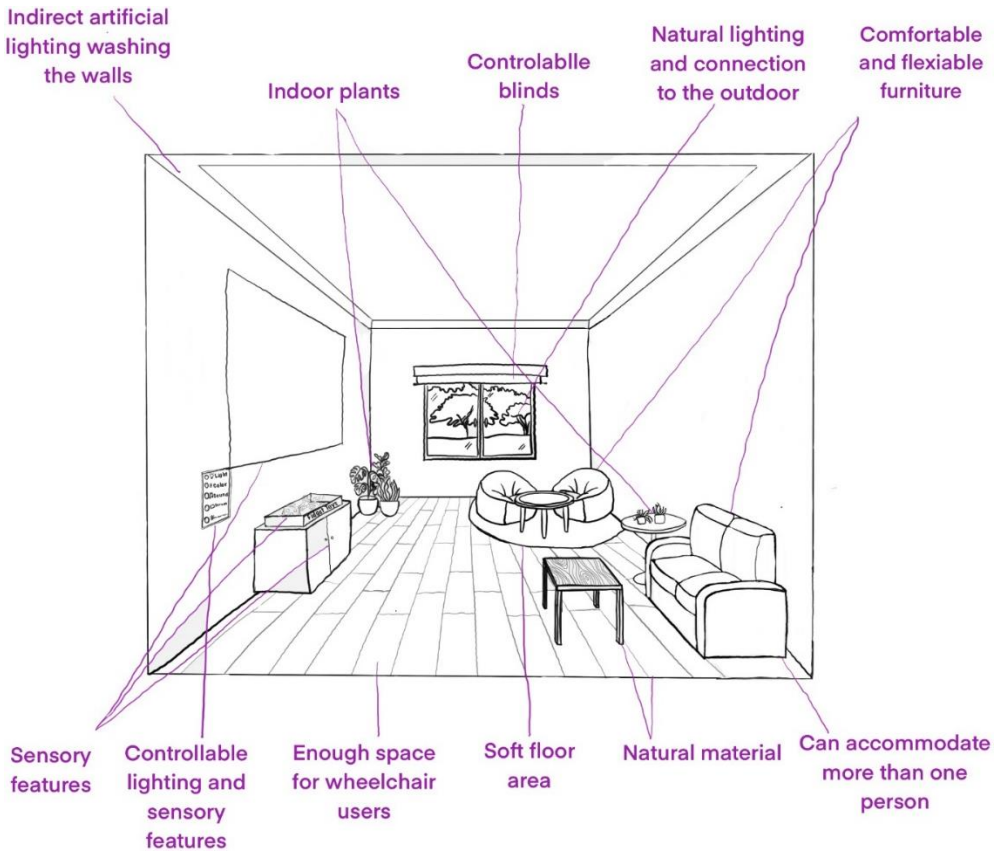


Figure 8-10: A visual synthesis of the participants' designs and comments for a recovery space

Another prominent theme in research stages 2 and 3 was the importance of feeling safe. A perceived lack of safety can lead to stress and anxiety, potentially discouraging individuals from visiting a location entirely. This concern is especially pronounced in unfamiliar buildings or those linked to prior negative experiences. Previous research noted the importance of safety for people with a learning disability and autistic individuals (Barr et al. 2003; Mostafa 2014b; Mostafa 2014a; The British Standards Institution 2022)

Suggestions for improving safety involve security features. For instance, having security personnel and well-placed security cameras can foster a sense of safety for users. Moreover, participants emphasised the importance of safe materials, such as anti-slip flooring, to prevent accidents, which supports the recommendations of PAS 6463 (The British Standards Institution 2022). Lastly, first aid boxes should be accessible throughout the building to address any health emergencies.

Building exterior and access

While the primary focus of the fieldwork was on the interiors of buildings, insights regarding the exteriors were uncovered during research stages 2 and 3. In stage 3, both participants and the facilitator emphasised the difficulty of locating the workshop's venue. This issue stemmed from the architectural style of the campus and the presence of dense tree cover (see Figure 8-7). Similar observations were made during employment.



Figure 8-11: The main road leading to the stage 3 and 4 venue. The university campus has dense tree cover and buildings of similar materials and colours

To address these challenges, it is recommended to utilise clear, accessible signage around building entrances, supporting the recommendations of BS 8300-2 (The British Standards Institution 2018) following the recommendations previously discussed in the Wayfinding section. Additionally, the strategic placement of landscaping, particularly trees, should be considered to guide people to the building rather than obscuring it.

The design and accessibility of entrances were also frequently discussed during different stages. Entrances and exits are typically busy areas, which can cause stress and feelings of being overwhelmed (The British Standards Institution 2018). Especially if the entrance lobby is too small, it can create a claustrophobic atmosphere. Moreover, poorly designed entrances that lack clear, accessible signage, reception desks, or floor staff can create confusion and hinder wayfinding.

To enhance the accessibility of entrances, it is recommended to minimise crowds whenever possible. One way to achieve this is by separating entrances from exits and using automatic sliding or folding doors, which can manage foot traffic more effectively than swing doors. Participants also noted that swing doors can cause injuries during periods of high activity. Entrances and exits should be evenly distributed throughout the building to prevent bottlenecks. Additionally, entrances should be free of obstacles to increase safety and improve clarity. Doors should also be wide enough to accommodate a wheelchair user and a carer, ideally utilising double doors. Finally, entrances and exits should be clearly labelled to reduce confusion and ensure a smooth flow of movement. PAS 6463 reinforces the recommendations on reducing crowds around entrances, in addition to providing alternative entrances and exits with clear signage (The British Standards Institution 2022).

Facilities

The need for accessible facilities emerged as a significant concern during research stages 2 and 3. Participants indicated that the availability of various facilities, such as toilets, hospitality services, information desks, and seating areas, among others, is crucial to their shopping and leisure experiences. A lack of such facilities is often viewed as a lack of accessibility, leading individuals to avoid certain buildings. Moreover, the absence of adequate facilities can contribute to feelings of stress, fatigue,

and anxiety. This aligns with earlier research, where people with a learning disability emphasised the importance of having facilities and the ability to use them independently (Barr et al. 2003; Mathers 2008). To be accessible, facilities should be regularly maintained and evenly distributed throughout the building. Participants highlighted several essential facilities, including toilets, hospitality facilities, information desks, and seating areas, among others, which will be discussed below.

- Toilets

This was one of the most frequently mentioned facilities, especially in stage 2. Toilets should be evenly distributed throughout the building, with a sufficient number of cubicles, as participants highlighted that they may wait for a long time in a queue to use a toilet. This is compounded by the fact that the disabled toilet may not always be accessible, and not all participants have a RADAR Key, which is the key that grants access to closed disabled toilets around the UK. This agrees with BS 8300-2**,** which highlighted that the time taken to reach a toilet is an essential element to be considered in designing toilet facilities (The British Standards Institution 2018).

Although many people with a learning disability do not use disabled toilets, following the holistic accessibility awareness concept, they highlighted the importance of the availability of disabled toilets in line with the recommendations of UK building regulations, Approved Document M and BS 8300-2 (The British Standards Institution 2018; The United Kingdom Government 2024). They also highlighted the need for a Changing Places facility, sanitary accommodations for individuals with multiple and complex disabilities, accompanied by one or two assistants (Changing Places Consortium 2015), affirming the recommendations of BS 8300-2 (The British Standards Institution 2018).

- Hospitality facilities

Restaurants and coffee shops can serve as recovery spaces where individuals can relax and recharge. Some participants preferred coffee shops and restaurants with outdoor space, as they may serve as a recovery space. Although hospitality facilities may not be quiet, they can serve as an alternative if a quiet room is not available. This adaptation was not highlighted in any of the literature reviewed. Restaurants and coffee shops could embrace this by providing a quieter zone in their layouts, as mentioned in the Coping Mechanisms section. This is also recommended for people with noise sensitivity (Fink 2024).

- Information/reception desk

Information desks are crucial for supporting signposting and wayfinding, which agrees with the recommendations of BS 8300-2 (The British Standards Institution 2018). Information desks should be strategically placed throughout the building, especially near entrances, to enable individuals to seek and receive assistance at the outset of their visit. Consistent with previous research and guidelines (Castell 2012; The British Standards Institution 2018; The British Standards Institution 2022).

Salmi elaborated on the design of the information desks, recommending that they should not be intimidating and should be staffed by readily identifiable personnel (Salmi 2007). Although the participants did not explicitly highlight that, some found it intimidating to approach the information desk during the walking interviews, noting that it had a simple design but was located in the centre of a relatively highly trafficked area, while others only approached staff members (see Figure 8-8).

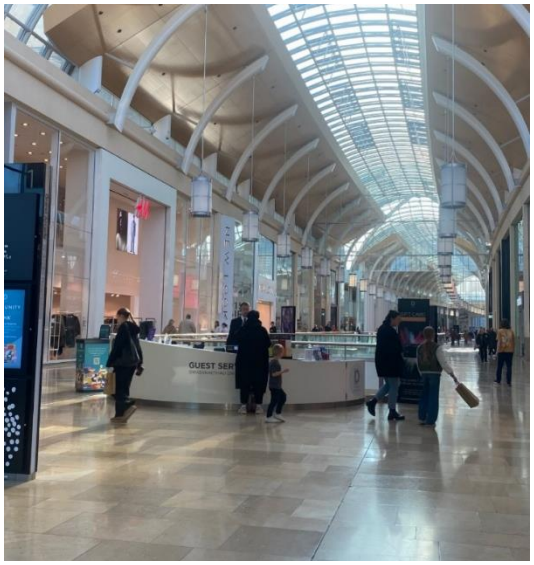


Figure 8-12: The information desk location on the first floor

- Seats

Similar to hospitality facilities, seats can act as recovery spaces, offering a place to rest and regain composure, which was also highlighted in BS 8300-2 recommendations (The British Standards Institution 2018). Like toilets, seats should be evenly distributed throughout the building.

The provision of seats should also include a variety of seats. For example, providing various designs, such as backless or cushioned options, along with adjusting their locations, positioning them in both bustling communal areas and quieter, more secluded spots, both indoors and outdoors, addresses the diverse needs for social interaction and solitude among users, thereby enhancing flexibility. This aligns with the recommendations of BS 8300-2 (The British Standards Institution 2018)

- Other facilities

Charging point facilities emerged during the workshops. Participants noted that they should be evenly distributed around the buildings and situated within the seating areas. Likewise, drinking fountains were mentioned only during the co-design workshops.

The built environment should offer access to as many of these facilities as possible to meet diverse needs and preferences. Facilities do not need to be restricted to a single location; they can be incorporated into a larger complex, with clear signage directing visitors to them and ample advertising to promote their presence.

Architectural insights synergy

This discussion demonstrated that various architectural insights, whether tangible or intangible, complement and overlap with one another. This was evident from the frequent cross-referencing among them. As a result, addressing one aspect provides solutions for the others. For instance, recovery spaces help manage sensory overload, while clear signs facilitate wayfinding and navigating unfamiliar environments. Therefore, inclusive design should be viewed as a holistic concept rather than a fragmented set of solutions and guidelines (see Figure 8-9).

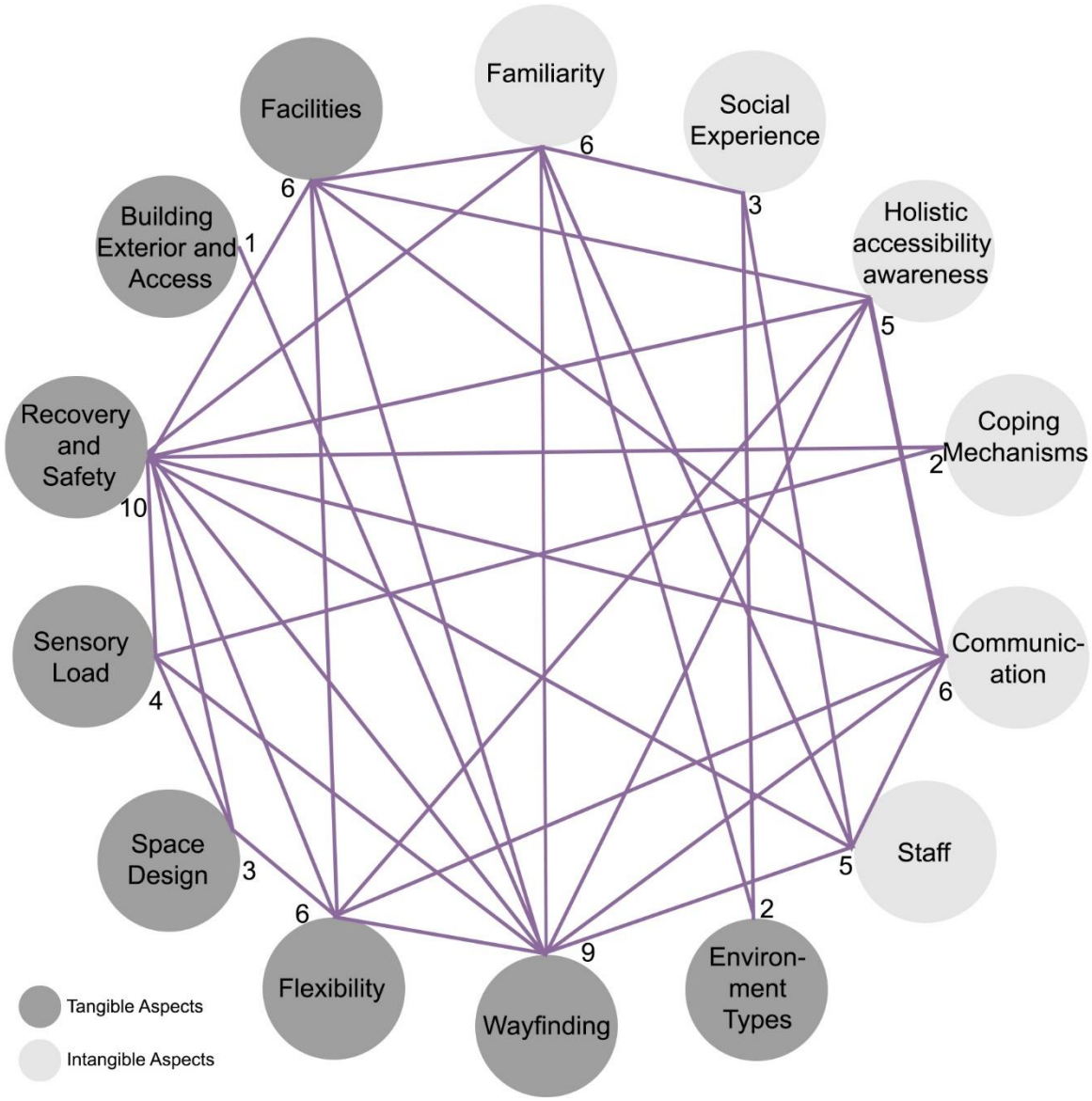


Figure 8-13: Architectural insights synergy

Figure 8-9 was developed through a review of each architectural insight, which involved revisiting them to note cross-references and mentions of other insights. Each connection represented by a line signifies that one aspect was discussed in relation to another. The number next to each insight denotes the total number of its cross-references to other aspects. The diagram highlights strong integration between tangible

and intangible insights, reinforcing that these elements are inseparable in inclusive design practices. Recovery and Safety and Wayfinding demonstrated the highest numbers of connections, aligning with their prioritisation for the co-design workshops. This highlights their centrality and potential as key starting points for architects and designers seeking to create a more comprehensive and inclusive built environment. A summarised breakdown of each connection is illustrated in Appendix 6, p. 295.

Additionally, the discussion also revealed that many of the architectural needs experienced by people with a learning disability overlap with those addressed in emerging neurodivergent-inclusive design guidelines. However, it also reinforced the importance of distinguishing learning disability as a specific group, considering the divergence of the needs.

Conclusion

This chapter synthesised the research findings with existing literature. The methodological framework highlighted the importance of employing participatory research approaches that actively involve people with a learning disability in the research process. By adopting a participant-centred approach, this study contributed to the broader discourse on inclusive research and revealed enabling measures that can guide future architectural studies. The inclusion of a disabled facilitator, collaboration with advocacy organisations, and flexible research design were crucial in ensuring meaningful participation. While some of these measures align with inclusive practices in other disciplines, their application within the context of architectural research is considered unique. They underscored the potential for enriched, participant-driven methodologies to inform future architectural studies.

Architecturally, the study demonstrated that accessibility is a multifaceted issue influenced by both tangible and intangible factors within the built environment. It emphasised the necessity of designing spaces that prioritise familiarity, flexibility, effective wayfinding, and recovery spaces. Many of the architectural insights align with recommendations for neurodiversity and the needs of other disabled groups, reinforcing the principle that inclusive design is simply “Good Design.” Others emerged as novel contributions, highlighting the unrecognised needs specific to people with a learning disability. Additionally, the insights revealed a strong synergy that emphasises the necessity for a holistic approach. The next chapter concludes the thesis, presenting a summary of findings, implications for future research, and the broader impact of this study.

9. CONCLUSION

This final chapter presents the thesis summary, discusses its potential limitations and impact, and also provides recommendations for future research.

Research Summary

This research primarily stemmed from the lack of architectural guidelines for people with a learning disability. While established guidelines exist for those with physical and visual impairments, and many are recently emerging for neurodiversity, guidance for people with a learning disability remains limited and predominantly focuses on wayfinding. This limitation can be attributed to societal attitudes, building regulations, and architectural practices, all of which are often linked to the narrow definition of disability as solely a physical impairment. This narrow focus likely raised from the visible nature of physical impairment, making it difficult to overlook in the architecture industry. Nonetheless, the findings demonstrated that buildings can also be inaccessible to people with a learning disability, leading them to develop coping mechanisms that can complicate their daily activities and restrict their independence, thereby underscoring the need for a comprehensive review of their accessibility requirements.

This research aimed to develop a methodological framework that ensures the active engagement of people with a learning disability in architectural research. This methodological framework was utilised to collaboratively produce architectural insights that address the challenges people with a learning disability face in the built environment. Addressing these barriers will consequently increase their independence, which is the long-term aspiration of this research. This was achieved through four research stages, employing a range of data collection methods. The dataset for each stage was analysed using reflexive thematic analysis, as it allowed for a nuanced understanding of the lived experiences of people with a learning disability due to its iterative and reflexive nature.

The first stage was Scoping, which employed semi-structured interviews to understand how people with a learning disability interact with various buildings and to select the case study, Cardiff Metropolitan Shopping Centre. This stage also concluded with several methodological and architectural insights, highlighting the importance of the facilitator and the impact of familiarity on building accessibility. The second stage was Exploring, which examined the barriers faced by people with a learning disability in shopping centres through walking interviews. This stage yielded methodological insights, emphasising the significance of prompts and personalisation. It also produced key architectural insights and solutions, categorised into intangible and tangible. The intangible insights highlighted the importance of communication, while the tangible insights emphasised the significance of clear wayfinding and recovery spaces. The third stage, Synthesising, aimed to verify the challenges identified in the previous stages through focus groups. These discussions provided an in-depth interpretation of the earlier findings, including sensory load, wayfinding, and recovery. The final stage was Co-design, where potential solutions were collaboratively developed through co-design workshops. These workshops generated practical design recommendations addressing recovery, signs, and the strategic placement of facilities. These stages were supported

by collaboration and employment for a local self-advocacy organisation for people with a learning disability. The collaboration informed the accessibility of each research process through consultations, and it also validated its findings. While employment provided a deeper understanding of the lived experiences of people with a learning disability, offering an insider perspective that was reflected upon in the analysis.

Collectively, the outcomes of all stages underwent reflexive thematic analysis, resulting in two outputs that represent the original contribution of this research. First is the personalised research process, characterised by some unprecedented enabling measures within built environment research to foster an inclusive research environment for people with a learning disability, including employing a disabled facilitator to ensure accessible and meaningful engagement. This inclusive methodology enriched the research and set a precedent for future studies within and beyond the field of architecture, offering a replicable framework— detailed in the previous discussion chapter —for inclusive research practices. Secondly, this research addressed a critical gap in architectural guidelines. Until now, no architectural guidelines have explicitly examined the needs of people with a learning disability. This study thus offers a foundational set of potential guidelines co-created with people with a learning disability.

The transformation of the built environment to become more inclusive, based on these insights, is not only beneficial for the learning disability community; it also has the potential to create a more inclusive atmosphere for a broader population, including older people, people with sensory sensitivities, and the neurodivergent population. Furthermore, this transformation provides support to the carers, families, and friends of people with a learning disability. Additionally, many of the architectural insights highlighted aspects related to general physical and mental well-being, such as connections with nature and principles of biophilic design. Thus, these insights aim to foster improved environments overall, inspired by the concept that inclusive design is fundamentally ‘Good Design’.

The researcher disputes the notion of assessing or prioritising equal access measures based on statistics pertaining to specific groups or the usage patterns of certain buildings. Establishing accessible environments should be seen as an ethical obligation of architects towards the community. This responsibility extends to all individuals involved in designing or creating environments and services. Developing inclusive environments also aligns with sustainability, as it upholds principles of whole-life durability and resource efficiency. Therefore, it ought to become second nature rather than an afterthought.

Consequently, the researcher aims to emphasise the concept of accessibility as a creative prompt rather than a burden. Architecture primarily centres on innovative problem-solving to meet users’ needs. Disability can inspire this creative process, which is why both the methodological framework and the architectural insights were not presented as a rigid set of rules. Instead, they were designed to enable architects to grasp the challenge and motivate them to create their own interpretations of solutions.

This approach encourages architects to view disability as a source of creativity rather than merely a challenge to be solved. In doing so, it supports a shift in the wider architectural field toward more inclusive practices, countering the historic marginalisation of disabled people within design processes. Ultimately, it provides enhanced ways of understanding the architectural implications of both bodily diversity and everyday socio-spatial practices, a concept previously highlighted by Boys (Boys 2014; Boys and Kajita 2023). Inclusion should not be an adjustment to design; it should be where design begins.

Strengths and Limitations

This research had several limitations that affected the generalisability of its findings, but also some strengths that enhanced its depth. One limitation was the sample size. Despite establishing a collaboration with a local self-advocacy organisation to aid recruitment, attracting participants from the learning disability community proved challenging. This difficulty stemmed mainly from the limited autonomy that many people with a learning disability have over their daily schedules, especially those in supported housing with structured routines. However, to mitigate this limitation, the research implemented a continuous feedback loop through regular consultations, reinforcing the credibility of the findings. Additionally, the researcher's employment and extensive engagement with the learning disability community in Cardiff enabled a rich, reflexive interpretation of the data, thereby enhancing its authenticity.

Another limitation was the research's geographical scope, which was confined to Cardiff, Wales. This potentially limits the generalisability of the findings to other geographical or cultural contexts within and outside the UK. Nonetheless, this localised focus was also a strength. It facilitated an in-depth, nuanced examination of how people with a learning disability interact with their local built environment. For example, the specific challenge of bilingual signage, required by Welsh regulations, highlighted the importance of clearly differentiating English and Welsh texts for ease of comprehension. The concentrated geographical context allowed the study to reflect local realities, community dynamics, and specific architectural challenges uniquely relevant to participants in Cardiff. Furthermore, the participatory ethnographic approach benefited greatly from extended, intensive engagement achievable only in a single location, yielding detailed, context-rich insights.

Lastly, the research's focus on a single building type and only one building within the fieldwork represented another limitation regarding generalisability to other architectural contexts. Yet, this specificity is a methodological strength. As an inductive study, the research aimed to deeply investigate architectural barriers for people with a learning disability rather than produce broad, surface-level generalisations. By comprehensively exploring a single case study, the research provided a robust, context-specific foundation upon which architects can creatively interpret accessibility, thus shifting accessibility from an afterthought to a central consideration in design. This approach demonstrated the value of actively engaging disabled people in architectural research,

providing a practical foundation that can inform inclusive design across diverse environments. Additionally, shopping centres are complex environments comprising a multitude of diverse settings, including shops, public spaces, hospitality and leisure facilities, among others. This enhances the generalisability of the findings outside the retail environments.

Despite the strengths discussed, the research process was not without challenges and tensions that merit critical reflection. Participant recruitment, for example, occurred through the self-advocacy organisation, limiting participation to people not connected to the organisation. Additionally, there were some methodological limitations. For example, during the workshops, the participants' design decisions were limited to the materials provided, such as colours and furniture types.

Future Research and Recommendations

The research findings offer potential avenues for future research and practice, targeting specific audiences, including researchers, architectural educators, architects and policymakers.

Researchers

Further investigation into the barriers faced by people with a learning disability in the built environment should be undertaken with a larger, more diverse sample. Future research could broaden its scope to include various types of buildings, thereby enhancing the generalisability of findings.

Moreover, one of the key insights from this study, the necessity for dedicated recovery spaces, requires further exploration. While this concept resonates with current research on the needs of autistic adults, recovery spaces are also being increasingly utilised in workplaces and educational settings to support overall well-being and the spiritual need for prayer. Future studies could investigate the multifaceted applications of these spaces across various contexts and populations, examining their broader applicability and impact.

Furthermore, future research on accessibility, particularly for people with a learning disability, should extend its focus beyond traditional settings such as healthcare and education, and place greater emphasis on leisure and entertainment environments, supported by the Activities theme in Chapter 5. While education and health services are undoubtedly essential, the right to access and enjoy leisure facilities is equally fundamental. Cinemas, theatres, sports venues, restaurants, and other recreational spaces are integral to everyday life, offering opportunities for social inclusion, enjoyment, personal expression, and wellbeing.

Finally, the architectural insights presented in this research align with the needs of other non-normative groups, such as autistic individuals, people with visual impairments, and older adults. Nevertheless, as noted by Heylighen et al., achieving resonance among various user needs often necessitates navigating challenging compromises

(Heylighen et al. 2017). Future research could investigate these overlaps more thoroughly, identifying design principles that act as foundational elements for inclusive environments accommodating various groups, as this research subtly addressed in the previous Discussion Chapter (see Figure 9-1).

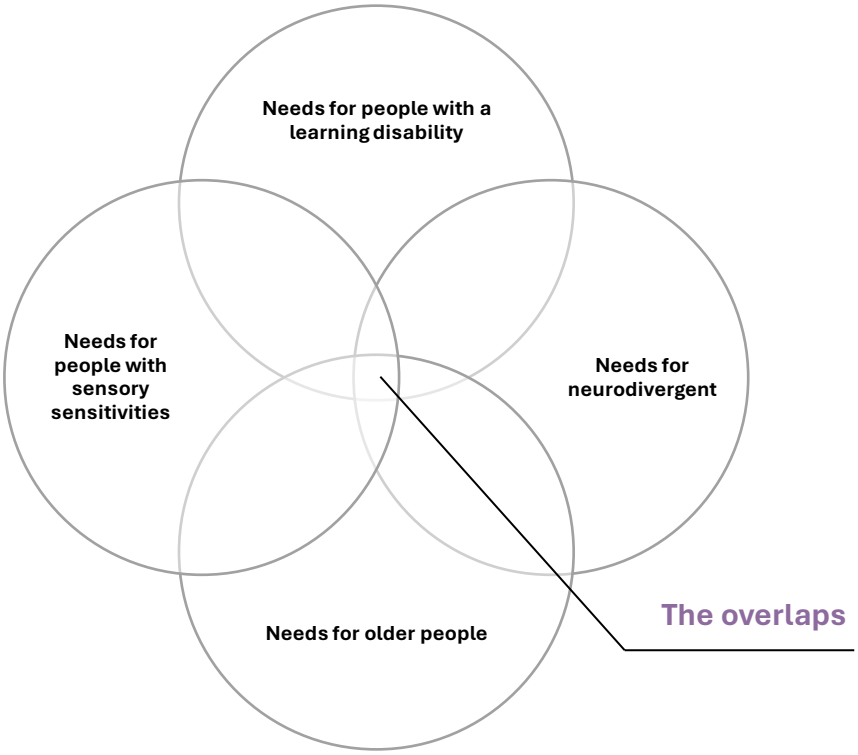


Figure 9-1: The concept of overlaps between various groups

Architectural educators

Architectural education has the potential to promote inclusive design principles among future architects. Educators should foster an empathetic approach, emphasising architects' ethical responsibility towards the community. This can be achieved by integrating live projects and/or stakeholders into the curricula, enabling students to engage directly with diverse groups and gain practical insights into accessibility challenges.

Additionally, rethinking inclusivity and accessibility as sources of creativity rather than limitations can motivate students to challenge conventional, ableist perspectives in the field of architecture. By framing these principles as avenues for innovation, educators can cultivate a mindset where inclusivity serves as a “design muse” central to architectural creativity and practice.

Architects and designers

This study emphasised the importance of considering the needs of diverse user groups. By concentrating on design features that address overlapping needs, such as accessible entrances, adaptable layouts, and recovery spaces, architects can create environments that are inclusive for a broader range of people (see Figure 9-1). Such

overlaps can provide a compelling rationale for inclusive design, particularly for business owners or clients prioritising cost-effectiveness. Rather than perceiving inclusive design exclusively as an added expense, these overlaps can clarify how inclusive features benefit a broader user base, offering potential returns on investment by appealing to diverse users including disabled customers whose collective purchasing power, often referred to as the 'Purple Pound', is estimated to be worth approximately £274 billion per year in the UK (The Purple Pound 2015).

Furthermore, the collaborative approach employed in this research revealed the significant potential of involving people with a learning disability in the design process. Architects and designers should strive for meaningful engagement with stakeholders in the design process, including people with a learning disability, from the outset to ensure the designs' accessibility.

Policymakers and business decision-makers

A critical area for future exploration is the cost of implementing inclusive design, particularly in terms of the timing of interventions, whether during the planning phase, construction, or retrofitting. Cost considerations frequently present a significant barrier to adopting inclusive design, especially in profit-driven sectors. This consideration is particularly pertinent given that, as previously highlighted, 52% of UK shopping centre floor space predates 1990, indicating substantial existing retail building stock that requires retrofitting to meet contemporary accessibility standards. Consequently, it is vital to investigate and demonstrate the economic implications and potential savings associated with early inclusion, starting from the planning stage. While cost is an essential factor, inclusive environments offer considerable societal and user benefits that extend beyond immediate financial concerns.

Research Impact

This section outlines the various impacts of this research and associated activities beyond its immediate findings. Each area of impact reflects a distinct facet of the research’s influence, ranging from directly engaging with the community to influencing educational and professional practices and building capabilities within architectural research.

Collaborative community engagement

This research involved sustained engagement with the learning disability community in Cardiff, resulting in a dynamic exchange of knowledge, empathy, and skills between the researcher and participants. Throughout this four-year doctoral journey, a variety of mutually beneficial interactions were cultivated with community members, services, and advocates.

The primary engagement occurred during the research process, which provided the researcher with extensive experience in working directly with individuals from the disabled community. Communicating with participants who had no prior background in

architecture or research compelled the researcher to refine her communication skills, developing clear and accessible language to discuss architectural concepts effectively. This fostered a connection between academic ideas and participants' lived experiences, facilitating a more inclusive dialogue about architecture and its impact on daily life.

For participants, the research activities provided a glimpse into architectural design and research, enabling them to make their voices heard and guiding them to various services around Cardiff. It also enhanced their understanding of the built environment and the challenges they might face. Furthermore, the co-design workshops allowed participants to be 'designers for a day', gaining positive feedback on the design activities. The research activities enabled them to actively engage in discussions about inclusive design, fostering a sense of value and recognition.

Additionally, the researcher connected with a befriending programme for more than one year. This volunteering opportunity enabled the researcher to develop a stronger and more empathetic connection to the community, which, in turn, enriched her accessible approach to the research. The researcher supported her matched friend in various leisure activities and directed her to resources around Cardiff, which deepened her understanding of the community's needs and aspirations.

Another critical aspect was working with Hamida, which offered mutual benefits for both the researcher and the facilitator. The facilitator's previous non-architectural research experience, along with her direct insights into the disability community, provided unique perspectives that enhanced the authenticity of the study's findings. On the other hand, this collaboration motivated the facilitator to refine her research skills, as indicated by her participation in additional research projects with different stakeholders. Additionally, Hamida presented her experience in facilitating this research in different academic venues, both alongside the researcher and independently.

Furthermore, during and after the primary field work, the researcher worked as a workplace personal assistant at the self-advocacy. This role also offered mutual benefits for the research and the organisation. For the research, it provided an invaluable opportunity for observations and interactions beyond the formal research environment, deepening the researcher's understanding of the challenges faced by the learning disability community. The researcher established herself as a trusted member of the community, which facilitated the building of rapport. Additionally, this role provided the researcher with a reflective space to contemplate the implications of the findings and to remain informed about local developments in policies, projects, and funding related to learning disability. Consequently, this position enabled the researcher to situate the study within broader social and policy frameworks, thereby enhancing the study's relevance to real-world community concerns and ensuring alignment with current developments.

On the other hand, by assisting disabled officers in their work, the researcher made a direct impact on the learning disability community, supporting the organisation and the officers in their advocacy efforts while fostering an inclusive environment. As well, the researcher participated in the SPARK Third Sector Research Partnership (TSRP), Pro Bono Research Support Scheme—Round 2, where she contributed research hours to the self-advocacy organisation, assisting them in developing their research question and conducting a targeted literature review and evidence synthesis on the benefits of self-advocacy, following a collaborative approach.

In addition to the personal assistant role, the researcher also served as an office administrator, supporting the organisation in their advocacy efforts in various facets. This involved enhancing communication and increasing the organisation's exposure through different venues, while maintaining an accessible work environment. All of this was achieved through working closely with the disabled frontline staff.

Pedagogy

The insights gained through this doctoral study influenced the researcher's approach to architectural pedagogy. While the researcher entered the Doctoral study with prior teaching experience as an Associate Lecturer in Architecture at Zagazig University, Egypt, the unique responsibility of teaching in the UK sparked a fresh perspective on inclusive design education and ethical practices, leading to comparative reflections shared in a paper for *Charrette,* the journal of architectural association educators (aae). The findings of this paper were also presented during a Post-Graduate Research (PGR) voice session at the host school, which focused on inclusive pedagogy, further broadening the conversation on embedding inclusive design in the architectural curriculum.

During the researcher's teaching practice at different institutions in the UK, the research findings on inclusive design directly informed studio discussions, aiming to instil accessibility as a foundational rather than an additional consideration. For four years, the researcher advocated for inclusive design principles, fostering students' awareness of inclusivity as an element that should inspire rather than restrict architectural creativity. By positioning accessibility as a 'creative process' rather than an afterthought, the researcher has encouraged students to view these considerations as integral to the design process.

Additionally, the researcher co-organised several extracurricular activities promoting inclusive design, such as co-organising and presenting at Neurodiversity Celebration Week. This event featured a workshop addressing the challenges faced by neurodiverse individuals in the built environment, garnering positive feedback from attendees who advocated for a more rigorous integration of inclusive principles in architectural curricula.

Furthermore, during the induction week, the researcher introduced first-year architecture students to the concept of inclusive design. She co-hosted a workshop where students examined the campus's accessibility, guiding them to identify and

analyse barriers in their own environment. Through this early exposure, students were encouraged to adopt a critical perspective on accessibility, which would enrich their subsequent design work. The researcher also served as a design reviewer for a third-year design unit, focusing on neurodiversity, and as an inclusive design consultant for MArch students. The researcher encouraged students to consider accessibility holistically, helping them view accessibility as a creative source rather than a limitation.

Now a prospective Lecturer in Architecture at Zagazig University, Egypt, the researcher's commitment to inclusive and ethical design extends beyond the studio. She aims to encourage students to think critically about normative assumptions, question conventional building codes, and reimagine what inclusive spaces might resemble. She also aims to promote an empathetic, user-centred perspective that empowers students to challenge stereotypes about who belongs in space and who benefits from architectural decisions, drawing inspiration from the research findings. In this way, the researcher aims to equip future architects with the skills to become thoughtful, ethical practitioners who understand accessibility as a vital component of their profession and are prepared to engage meaningfully with users and advocate for their needs. Following the research recommendations on addressing the gap in inclusive design knowledge through education.

Engagement and advocacy

The researcher had prior experience in architectural practice, including roles as an architect, interior and urban designer. However, this research brought a unique experience by exploring a new area of practice through consultations (see Practice note 2). The first consultation opportunity emerged from a national retailer who invited the researcher to three different workshops to discuss their inclusive strategies. This enabled the research to be explored in a non-academic setting, fostering diverse perspectives on inclusive design, including cost and profitability. The researcher argued that disability affects everyone; therefore, providing appropriate building access increases the proportion of the population who can access retail spaces. This results in a larger client base for the business. The workshops allowed the team to reflect on their existing inclusive strategies and brainstorm potential guideline changes.

Another impact on professional practice, which also involved community engagement, was the creation of an Inclusive Retailer Guide. In this guide, the researcher, alongside the self-advocacy organisation, provided recommendations for a more inclusive retail environment. Additionally, the researcher joined the British Standard Institution (BSI) as part of a drafting panel for the revision of the BS8300-1 and 2:2018 Design of an accessible and inclusive built environment. This opportunity will enable the researcher to incorporate the findings into the building guidelines, which had previously failed to meet the needs of people with a learning disability. The researcher aims to further influence professional practice by collaborating with architectural firms to comprehend the implications of applying the results.

Research skills, dissemination and networking

While the researcher began this doctoral study with foundational research experience from their Master's level, the four-year engagement with this study led to the development of more rigorous and professional research skills, which were vital in meeting the challenges of this study. This process sharpened the researcher's skills in qualitative research methods, particularly in engaging vulnerable participants who may not be familiar with architectural concepts. Working in an interdisciplinary environment, guided by supervisors from the Schools of Architecture and Healthcare Sciences, further emphasised the importance of a clear, accessible language to communicate concepts and findings effectively across fields.

The researcher's dissemination efforts also contributed to the study's impact by reaching multidisciplinary national and international audiences. Presenting at various conferences, symposia, and workshops highlighted the study's contributions to inclusive design practice and methodologies, as well as increased awareness of accessibility issues in the built environment.

School level

The researcher presented at the Welsh School of Architecture's (WSA) annual exhibition on two occasions. In 2022, her contribution also included an online presentation alongside other researchers from the school. In 2023, her work was recognised with the WSA Exhibition PGR prize. Both events provided a platform to showcase the study's findings.

Additionally, the researcher contributed to the WSA Post-Graduate Research Poster event in both 2022 and 2023. By highlighting accessible and inclusive architectural research in a forum familiar to peers and faculty, these dissemination venues helped raise awareness of the inclusive research culture within the school.

The researcher also co-designed a "Neurodiversity in the Workplace" workshop for WSA staff. The workshop brought together postgraduate students and school staff, aiming to raise awareness of neurodiversity in the workplace and recommend accessible strategies to foster a more inclusive environment. In addition to talks, the workshop also included an activity where participants explored different barriers and suggested potential solutions.

Institutional level

On a broader institutional level, the researcher actively contributed to disability research discourse at Cardiff University. The researcher and the facilitator were invited to present the research at one of the Cardiff Interdisciplinary Network on Disability (CIND) sessions, where they discussed the research process and their collaboration with a wide range of disability researchers across Cardiff.

They were also invited to speak at a workshop titled "Doing Research with People with a learning disability," where they presented the study's methodological framework and discussed strategies for conducting architectural research with people with a learning

disability alongside other researchers and organisations working with people with a learning disability. This workshop enabled the researcher to share practical insights from the study, supporting inclusive research principles within the university's research culture.

Furthermore, the researcher and facilitator presented the study's methodological framework at the SPARK Research Showcase on Disability, which highlighted innovative research on disability. This event provided an opportunity for the researcher to share the study results and promote inclusive research principles within and beyond the university.

The researcher further amplified the study's reach by participating in Cardiff University's Three Minute Thesis (3MT) competition, organised by the Doctoral Academy. The researcher secured both the First Prize and the People's Choice Award, demonstrating wide appeal across disciplinary boundaries. This helped raise awareness of the barriers faced by the learning disability community and the necessity of inclusive and collaborative research practices.

Lastly, the researcher was co-awarded a grant from the Cardiff University Research Cultural Fund twice to co-organise a university-wide event focusing on disability research. These events brought together academics and stakeholders from more than ten schools and institutions, both within and outside the university, encompassing a range of researchers from early-career researchers to established professors, in addition to a wide range of disability organisations on a national level. It aimed to foster interdisciplinary collaboration in disability research. By initiating and leading this event, the researcher expanded the reach of the study's findings and encouraged future interdisciplinary work on disability and inclusive design across the university.

National level

The research findings were shared with academics from various institutions at two symposia. First was the Architectural Humanities Research Association (AHRA) Research Student Symposium, 2023. The researcher hosted a roundtable titled "Disability Research: A Multidisciplinary Perspective," bringing together researchers from various disciplines to facilitate a discussion on the unique challenges and experiences faced by researchers in disability studies.

The second was "Architectures of Alterity: Body, Media, and Space" (2023). The researcher presented the results in a presentation titled "Designing for Non-Normative Bodies: People with a Learning Disability." Engaging with the audience on how different bodies interact with architectural spaces. Both events fostered wider exposure to the research findings.

International level

At an international level, the researcher shared the study's findings with a broader academic and professional audience. Presenting at the AMPS (Architecture, Media, Politics, Society) conference, "Livable Cities – New York, 2023," the researcher delivered

a paper titled “Towards More Inclusive Design in Shopping Centres: Engaging People with a Learning Disability in Architectural Research.” Published in the conference proceedings, this paper extended the impact of the research by disseminating its findings to a diverse, interdisciplinary audience. Following this conference, she was invited to serve as a peer reviewer for abstracts for the Urban Futures-Cultural Pasts Conference (AMPS).

Additionally, she presented at the 16th Nordic Network on Disability Research (NNDR) Research Conference in 2023 and the 28th International Association for People-Environment Studies (IAPS) Conference in 2024. These opportunities to present to both architectural and healthcare professionals underscored the study’s significance across disciplines and highlighted the importance of inclusive design in enhancing accessibility within various built environments.

Across these levels, from local to international, this research has demonstrated its ability to influence conversations surrounding inclusive design. By contributing to the local academic community, fostering interdisciplinary collaboration at the university level, and reaching an international audience, this study supported a foundation for future research and practice in inclusive architecture.

This research had a multifaceted impact across academia, community, pedagogy, and practice. It advanced inclusive architectural research methodologies, broadened interdisciplinary discussions, and fostered meaningful collaborations with the learning disability community. By incorporating inclusive design principles within architectural education, it influenced future architects' perspectives, reframing accessibility as a creative driver rather than a limitation. Beyond academia, the study’s engagement with businesses, advocacy groups, and policymakers has contributed to shaping inclusive practices in real-world environments. The integration of findings into national guidelines and professional consultations highlights the study’s potential for long-term impact. Collectively, these contributions emphasise the significance of this research in bridging the gap between theory and practice, advocating for inclusivity at all levels, from architectural education to policy and design implementation.

Epilogue

To conclude this thesis, I would like to adopt a more personal tone, reflecting on the transformative four-year journey that this research has undertaken. I am genuinely astonished by how much this experience has altered me, not only as a researcher but also as an individual. When I began, I was an outsider to the disabled community, motivated by a straightforward curiosity to address a clear research gap. I could not have envisaged the depth of understanding, empathy, and commitment that would emerge from my interactions with this community. The initial phases of this research were characterised by what I now recognise as a somewhat naive perspective on inclusivity. I believed I understood what inclusivity entailed, but I quickly realised that no literature review can adequately prepare an outsider for the lived experiences of the

disabled community. This became evident throughout the various chapters of the thesis. Over time, through each interaction, I learned to listen, not solely with academic interest but with genuine care and empathy. Listening developed into one of the most profound skills I nurtured along this journey.

Throughout this research, I gradually transitioned from an outsider to an insider, ultimately becoming an advocate for inclusivity through various roles and responsibilities. I began in the academic realm as an educator, aiming to instil a sense of ethical duty and an empathetic approach in aspiring architects while raising awareness within the academic community. I evolved into a keen researcher, exploring various collaboration opportunities for inclusive research, organising events focused on this subject, and speaking at national and international venues on inclusivity. I have served as a consultant, working to create a more inclusive environment, and have taken on a role in the third sector to support disabled employers. I have developed personal relationships as a trusted friend within the disabled community. Through these experiences, I built a network where I am recognised as an 'Inclusivity Ally', a label I now wear with pride, as it signifies a shift in my perspective that is integral to this study's methodological framework. This framework stands both as a product of and a testament to this journey, embodying a co-design approach that transcends academic theory to actively engage, include, and value the contributions of disabled participants. I believe that interactions with the disability community and attentively listening to their perspectives should ignite the creative design process rather than serving as an afterthought or merely as part of an Equality, Diversity and Inclusion (EDI) checklist.

In reflecting on the broader implications of my work, I often draw parallels between inclusivity and sustainability. Historically, ignorance of sustainability has led to severe global challenges such as climate change and biodiversity loss, consequences we now urgently address. Inclusivity, I believe, is on a similar trajectory. Fortunately, international movements advocating inclusivity are gaining momentum, promising a future where inclusive principles are as deeply embedded as sustainability practices. I also argue that the architectural community fostered design solutions, such as ramps, lifts, and accessible facilities, for approximately 1.2 million wheelchair users in the UK (Baxter 2025). Thus, creating inclusive environments for the UK's 1.5 million people with a learning disability through simpler interventions, such as clear signage, accessible facilities, and recovery spaces, is not only achievable but, on the contrary, feasible.

Reflecting on the beginning of my journey, I believe I was not sufficiently motivated to embark on it, or perhaps I was simply 'inclusivity ignorant'. However, I can confidently say that my motivation to persist in this advocacy across various venues has grown. I can feel the drive in my heart, a passion that ignites a burning eagerness for the next steps and generates an endless stream of ideas for what to do next.

BIBLIOGRAPHY

Bibliography

initial value

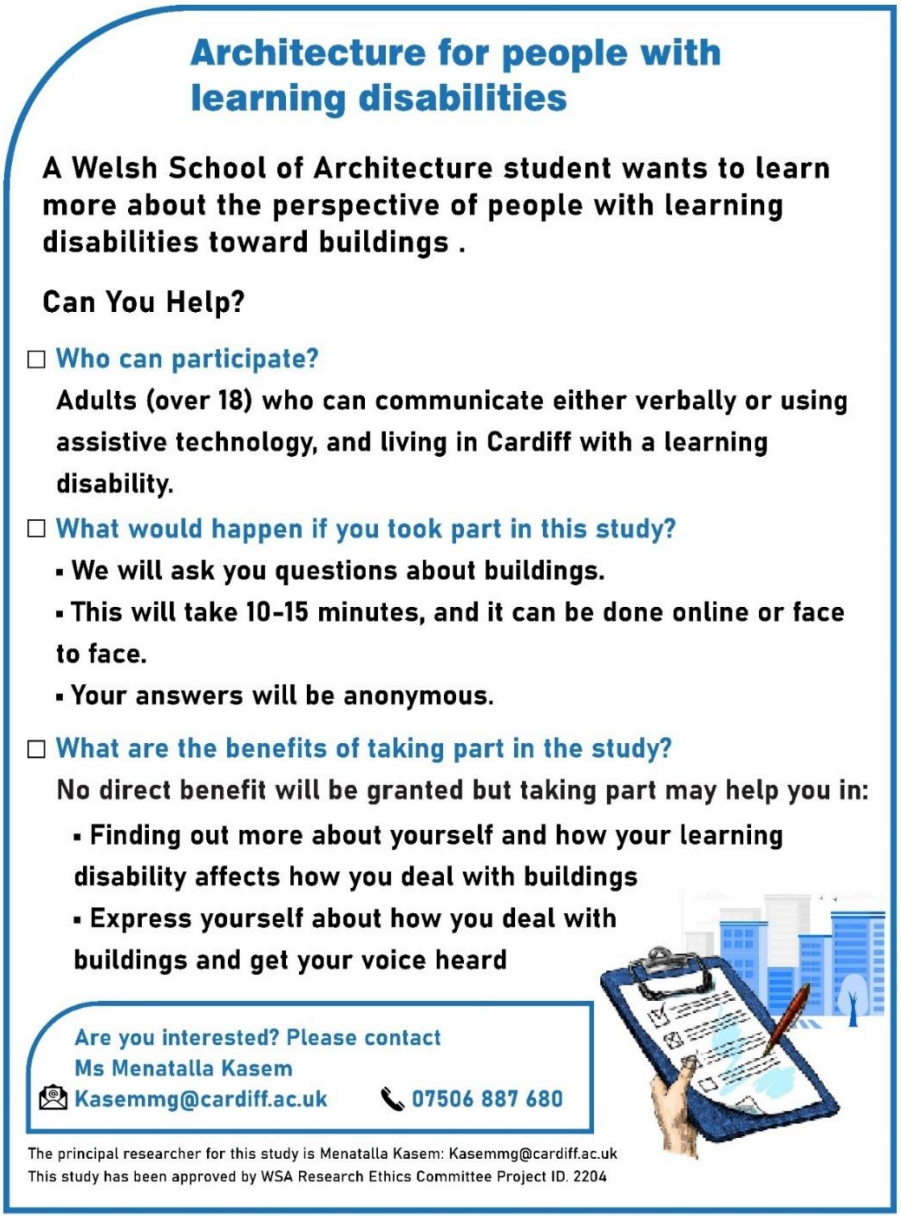
APPENDICES

Appendix 1

This appendix includes the participant-facing materials used during the first research stage, Scoping. The flyer, consent form, and participant information sheet were developed in accordance with Easy-Read and other accessibility standards. This sample is included here to demonstrate the approach taken throughout all the research stages. However, the participant-facing document underwent revisions through consultations before each research stage.

Recruitment flyer

This recruitment flyer was designed using accessible colours, clear fonts, and simple language. An expert in education development reviewed it to ensure readability and visual clarity for people with a learning disability.



Participant information sheet

The participant information sheet provides a simplified overview of the study's aims, procedures, and participants' rights. However, it was only used for the participants' records as its information was transferred into a video format as recommended during the consultations.

Easy Read

Project Information Sheet

This is the information sheet for research called:
Building Accessibly for People with Learning Disabilities

How to use this document

- This is an easy read version. The words and their meaning are easy to read and understand.
- You may need support to read and understand this document. Ask someone you know to help you.
- Some words may be hard to understand. They are in **bold blue** writing. They are explained in a box below the word. If the hard word is used again it is in normal blue writing. You can check what they mean on the last page.
- Please take time to read the following information carefully and discuss it with others if you wish.
- After you read and understand this information sheet, you may decide if you want to take part.

- Where the document says **we**, this means **research team**. For more information contact:



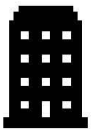
Name	**Ms Menatalla Kasem**



Mobile	07506 887 680



Email	Kasemmg@cardiff.ac.uk



Address	Room Number 1.40 Bute Building King Edward VII Avenue Cardiff CF10 3NB



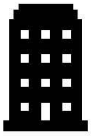
Name	**Dr Sam Clark**



Phone	029 2087 4430



Email	clarksd1@cardiff.ac.uk



Address	Room Number 2.66 Bute Building King Edward VII Avenue Cardiff CF10 3NB

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How to use this document **1**
About this research project **4**
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What will happen if you take part? **6**
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About this research project



- This **research project** aims to help making buildings more accessible for people with learning disabilities.

> **Research project** is where people spend time collecting information to find out new things. And then share what they have found.

- This research is conducted by **Menatalla Kasem** a student at Welsh School of Architecture in Cardiff University

- This research project has been agreed by the Welsh School of Architecture **Research Ethics Committee** at Cardiff University.

> A **Research Ethics Committee** is a group of people assigned to review research to assess if it is ethical.

About Your Participation

You are invited to take part because you are:

+18



1. An adult (over the age of 18)
2. Can communicate either verbally or using assistive technology.
3. You have a learning disability.



- Your participation is **voluntary**.

Voluntary means you chose to do it without payment.

- If you do not want to take part, you do not have to explain your reasons and it will not affect your rights.



- If you are a Cardiff University student, your participation will not affect your education.



- If you are receiving care, your participation will not affect the care you receive.

What will happen if you take part?



- If you decide to take part, we will explain the research project for you, and ask you to sign a **consent**.

Consent means you agree to take part.



- If you decide to take part, we will ask you questions about buildings. This will take 15 to 30 minutes.



- We will audio record your answers to the questions



- If you decide to take part, you will have a copy of the information sheet and a signed consent.

Taking Part

What you get out of taking part?



- You will not receive money if you take part.
- In the future, this **research project** may help architects in making buildings more accessible to people with learning disabilities.



- There will be no direct benefits of you participation.
- Your answers will help us understand how you deal with buildings.



- It could help you find out more about yourself and how your learning disability affects your perception of buildings.



- You will express yourself about how you deal with buildings and get your voice heard.



- You are free to leave at any time, without giving a reason.

What risks are there of taking part?



- There is no potential risk on you.

- If you are harmed by taking part in this research project, there are no special payment arrangements.

- If you are harmed due to carelessness, you may have grounds for legal action, but you may have to pay for it.

What will happen to the information you give?



- Your participation will be **confidential**.

> **Confidential** means no one will know you participated

- Any personal information you provide will be kept safe.



- There may be situations which we may need to override your confidentiality.
- **For example**, where we believe that there is a risk to your safety or the safety of others.
- We will aim to notify you of the need to break confidentiality (but this may not be appropriate in all cases).



- Your answers will be used **anonymously** in the research.

> **Anonymous** means no one will know you said these words.

- Your email address or mobile number will only be used to re-contact you for future surveys.

- Cardiff University is the Data Controller and will respect and protect your personal data.



- All your personal data and consent will be kept for 5 years.



- Your consent may be seen by the research team and members of the University or by regulatory authorities.



- Anonymised information will be kept for at least of 5 years.
- Anonymised information may be published.
- Anonymised information may be kept indefinitely, for research purposes.



- If you leave your Personal Data will be held by Cardiff University for 5 years.



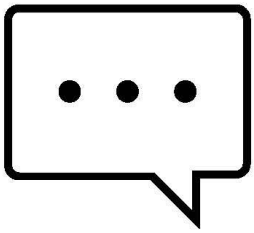
- At the end of the research project, the data will be held by Cardiff University for 5 years with minimum access.



- We intend to publish the results in academic journals and conferences.



- You will not be identified in any publications.

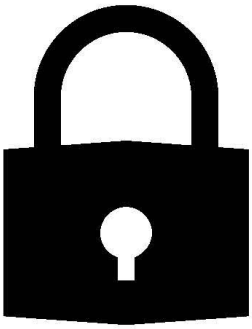


- We may use your quotes anonymously.

Easy Read

- If you are interested in knowing the research results, you can inform us, and we will make sure we send it to you in an accessible format.

Further information about Data Protection, including:



- Your rights
- The legal basis under which Cardiff University processes your personal data.
- Cardiff university's data protection policy
- How to contact the Cardiff University data protection officer

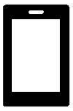
How to contact the information commissioner's office may be found at https://www.cardiff.ac.uk/public-information/policies-and-procedures/data-protection

Complaints

If you wish to complain about any aspect of how you have been approached or treated, please contact



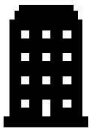
Name Ms Menatalla Kasem



Mobile 07506 887 680



Email Kasemmg@cardiff.ac.uk



Address Room Number 1.40
Bute Building
King Edward VII Avenue
Cardiff
CF10 3NB

If your complaint is not managed to your satisfaction, please contact **School Ethics Officer** at the **Welsh School of Architecture**



Name Dr Christopher Whitman



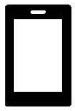
Email ARCHI-ethics@cardiff.ac.uk

Contact Information

If you have any questions relating to this research project, you may contact us during normal working hours:



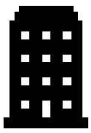
Name Ms Menatalla Kasem



Mobile 07506 887 680



Email Kasemmg@cardiff.ac.uk



Address Room Number 1.40
Bute Building
King Edward VII Avenue
Cardiff
CF10 3NB

Support Information

If you need any support relating to your disability, you may contact any of the following agencies

Learning Disability Wales	phone	02920681160
	Website	https://www.ldw.org.uk/
mencap cymru	phone	08088081111
	Website	https://wales.mencap.org.uk/
Cardiff People First	phone	02920231555
	Website	https://www.cardiffpeoplefirst.org.uk/

Thank you for considering taking part in this research project.

Hard words

Research project

Research project is where people spend time collecting information to find out new things. And then share what they have found.

Research Ethics Committee

Research Ethics Committee is a group of people assigned to review research to assess if it is ethical.

Voluntary

Voluntary means you chose to do it without payment.

Consent

Consent means you agrees to take part.

Confidential

Confidential means no one will know you participated

Anonymous

Anonymous means no one will know you said these words.

Consent Form

The consent form used clear, concise language to explain participants' rights, data use, and the voluntary nature of their participation. It was formatted following the Easy-Read format and mostly admitted verbally.

Easy Read

CONSENT FORM

A **consent** means you agree to take part.

Title of **research project**: **Building Accessibly for People with Learning Disabilities**

A **research project** is where people spend time collecting information to find out new things. And then share what they have found.

Welsh School of Architecture Research Ethics Committee
Project ID: 2204

A **Research Ethics Committee** is a group of people assigned to review research to assess if it is ethical.

- Some words may be hard to understand. They are in **bold blue** writing. They have been explained in a box below the word. If the hard word is used again it is in normal blue writing. You can check what they mean in on the last page.
- **Please read and sign this form if you agree to take part in this research project**

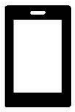
Page **1** of **10**

Contact Information

If you have any questions relating to this research project, you may contact us during normal working hours:



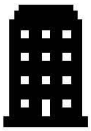
Name Ms Menatalla Kasem



Mobile 07506 887 680



Email Kasemmg@cardiff.ac.uk



Address Room Number 1.40
Bute Building
King Edward VII Avenue
Cardiff
CF10 3NB



- I read the information sheet. ☐



- I understand the information sheet. ☐

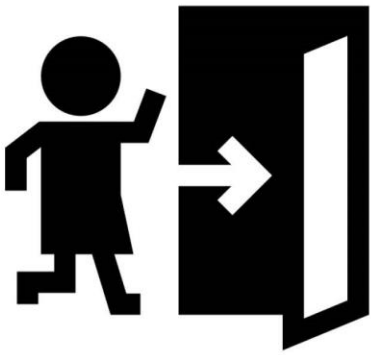


- My questions about the project were answered. ☐

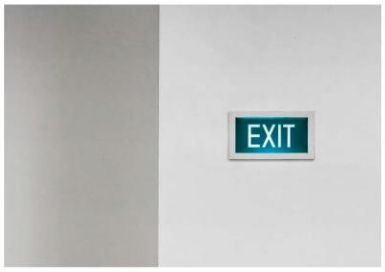


- I understand that my participation is **voluntary**. ☐

> **Voluntary** means you chose to do it without payment.



- I understand that I am free to leave at any time without giving a reason and without any concerns.



- I understand that if I leave, the information collected from me may be kept by Cardiff University.



- I understand that data collected may be seen by individuals from Cardiff University or from regulatory authorities.
- I give permission for these individuals to access my data.



- I agree to the managing of my personal information:
  - Location data
  - Email or phone number
  - Type of disability if given
- for the purposes explained to me.

☐



- I understand that this information will be protected unless release is required by law or professional obligation.

☐



- I understand who will see my personal information.

☐



- I understand how my data will be stored.



- I understand what will happen to the data at the end of the project.



- I agree to the audio recording of the interview, and I understand how it will be used.



- I understand that **anonymised** quotes from my answers may be used and published.

Anonymous means no one will know you said these words.

☐



- I understand how the results will be published.

☐



- I agree to take part in this research project.

☐

I read and understand this form and agree to take part in this research project



Your Full Name



Date



Signature

The Researcher (person taking consent)



Full Name



Date



Signature

Role of person taking consent

Support Information

If you need any support relating to your disability, you may contact any of the following agencies

Learning Disability Wales / Anabledd Dysgu Cymru	Learning Disability Wales	phone	phone	02920681160
		Website	Website	https://www.ldw.org.uk/
mencap cymru	mencap cymru	phone	phone	08088081111
		Website	Website	https://wales.mencap.org.uk/
Cardiff People First – Disability is not inability!	Cardiff People First	phone	phone	02920231555
		Website	Website	https://www.cardiffpeoplefirst.org.uk/

Thank you for participating in our research

You will be given a copy of this consent to keep

Hard words

Consent

Consent means you agrees to take part.

Research project

Research project is where people spend time collecting information to find out new things. And then share what they have found.

Research Ethics Committee

is a group of people assigned to review research to assess if it is ethical.

Voluntary

Voluntary means you chose to do it without payment.

Anonymous

Anonymous means no one will know you said these words.

Appendix 2

Ethical approval letter for research stage 1

This appendix includes the ethical approval letter issued by the Welsh School of Architecture Research Ethics Committee (SREC) for this study (Ref: 2204). The document confirms the committee's favourable ethical opinion of the project proposal, allowing the first research stage to proceed. It outlines the review process, approved materials, and responsibilities related to ethical conduct throughout the research.

29/03/2022

Dear Menatalla Kasem,

Research project title: Interactive Architecture for People with Learning Disabilities: Utilizing Co-Design to Move Toward Equitable Public Buildings

SREC reference: 2204

The Welsh School of Architecture's Research Ethics Committee ('Committee') reviewed the above application electronically by email between 17/02/2022 and 25/02/2022, and amendments reviewed by the Committee Chair 29/03/2022.

Ethical Opinion

The Committee gave:

A a favourable ethical opinion of the above application on the basis described in the application form, protocol and supporting documentation.

Additional approvals

This letter provides an ethical opinion only. You must not start your research project until all appropriate approvals are in place.

Amendments

Any substantial amendments to documents previously reviewed by the Committee must be submitted to the Committee via ARCHI-ethics@cardiff.ac.uk for consideration and cannot be implemented until the Committee has confirmed it is satisfied with the proposed amendments.

You are permitted to implement non-substantial amendments to the documents previously reviewed by the Committee but you must provide a copy of any updated documents to the Committee via ARCHI-ethics@cardiff.ac.uk for its records.

Monitoring requirements

The Committee must be informed of any unexpected ethical issues or unexpected adverse events that arise during the research project.

The Committee must be informed when your research project has ended. This notification should be made to ARCHI-ethics@cardiff.ac.uk within three months of research project completion. For Student projects, submission of the associated dissertation will be considered to be notification.

[Version 00] [Date 25/02/2022]

Documents reviewed by Committee

The documents reviewed by the Committee were:

Document	Version	Date
WSA_Ethics-Review-Application-Proforma_170222	2	17/02/2022
Consent-Form_MK_V4	4	25/03/2022
Consent-Form_Easy-Read_MK_V4	4	25/03/2022
Consent-Form_Screen-read_MK_V4	4	25/03/2022
Project_Information_Sheet_MK_V4	4	25/03/2022
Project_Information_Sheet_Easy-Read_MK_V4	4	25/03/2022
Project_Information_Sheet_Screen-Reader_MK_V4	4	25/03/2022
Exploratory survey_MK_V4	4	25/03/2022
Exploratory survey_easy-read_MK_V4	4	25/03/2022
Exploratory survey_screen-reader_MK_V4	4	25/03/2022
easy read req_MK_V2	4	25/03/2022
Summary of update (from MK's email)	1	25/03/2022
Flyer_MK_V4	4	08/02/2022
Research Integrity training_		30/11/2021

Complaints/Appeals

If you are dissatisfied with the decision made by the Committee, please contact the Chair of the Committee via ARCHI-ethics@cardiff.ac.uk in the first instance to discuss your complaint. If this discussion does not resolve the issue, you are entitled to refer the matter to the Head of School for further consideration. The Head of School may refer the matter to the University Open Research Integrity and Ethics Committee (ORIEC), where this is appropriate. Please be advised that ORIEC will not normally interfere with a decision of the Committee and is concerned only with the general principles of natural justice, reasonableness and fairness of the decision.

Please use the Committee reference number on all future correspondence.

The Committee reminds you that it is your responsibility to conduct your research project to the highest ethical standards and to keep all ethical issues arising from your research project under regular review.

You are expected to comply with Cardiff University's policies, procedures and guidance at all times, including, but not limited to, its Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data and our Research Integrity and Governance Code of Practice.

Yours sincerely,

[Version 00] [Date 25/02/2022]



Cc Dr Mhairi McVicar

Dr Chris Whitman

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[Version 00] [Date 25/02/2022]

Appendix 3

Participation certificate

This appendix presents the certificate of participation, which was distributed to the participants. Developed in collaboration with the facilitator and signed by both the researcher and the supervisor, the certificate served as a token of appreciation for the valuable time, insight, and lived experiences shared by participants throughout the study. The gesture aimed to acknowledge their contributions and reinforce their role as co-creators in the research process.



Appendix 4

Stage 2 ethical approval letter

This appendix presents the ethical approval letter for the second research stage, issued by the Welsh School of Architecture's Research Ethics Committee (SREC no. 22111). This approval followed consultations with the facilitator, ensuring that all procedures involving participants met the necessary ethical standards. The letter outlines the conditions under which the research was authorised and includes a summary of the documents reviewed by the committee.

21.12.22

Dear Menatalla,

Research project title: Interactive Architecture for People with Learning Disabilities: Utilizing Co-Design to Move Toward Equitable Public Buildings.

SREC reference: 22111

The Welsh School of Architecture's Research Ethics Committee ('Committee') reviewed the above application on 16.12.22-21.12.22 via its full review process.

Ethical Opinion

The Committee gave

EITHER

A a favourable ethical opinion of the above application on the basis described in the application form, protocol and supporting documentation.

Additional approvals

This letter provides an ethical opinion only. You must not start your research project until all appropriate approvals are in place.

Amendments

Any substantial amendments to documents previously reviewed by the Committee must be submitted to the Committee via ARCHI-ethics@cardiff.ac.uk for consideration and cannot be implemented until the Committee has confirmed it is satisfied with the proposed amendments.

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Monitoring requirements

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The Committee must be informed when your research project has ended. This notification should be made to ARCHI-ethics@cardiff.ac.uk within three months of research project completion. For Student projects, submission of the associated dissertation will be considered to be notification.

Documents reviewed by Committee

The documents reviewed by the Committee were:

Document	Version	Date
WSA_Ethics-Review-Application-Proforma_MK_SC	01	06.12.22
2nd survey_MK	01	06.12.22
Consent_MK	01	06.12.22

[Version 00] [Date 07/01/2021]

PIS_MK	01	06.12.22
Research Integrity training		14.12.22

Complaints/Appeals

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Yours sincerely,

Dr Eshrar Latif

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Dr Eshrar Latif

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[Version 00] [Date 07/01/2021]

Appendix 5

Ethical approval letter for stages 3 and 4

This appendix includes the ethical approval granted by the Welsh School of Architecture's Research Ethics Committee (SREC reference: 23048), covering the final two stages of the research: Synthesising and Co-design. The application included updates based on prior consultations and outlined the study's expanded participatory methods. The approval confirms that all supporting documentation and ethical considerations for these stages were reviewed and accepted by the committee.

03.10.23

Dear Menatalla,

Research project title: Interactive Architecture for People with Learning Disabilities: Utilizing Co-Design to Move Toward Equitable Public Buildings.

SREC reference: 23048

The Welsh School of Architecture's Research Ethics Committee ('Committee') reviewed the above application on 03.10.23 via its full review process.

Ethical Opinion

The Committee gave

A a favourable ethical opinion of the above application on the basis described in the application form, protocol and supporting documentation.

Additional approvals

This letter provides an ethical opinion only. You must not start your research project until all appropriate approvals are in place.

Amendments

Any substantial amendments to documents previously reviewed by the Committee must be submitted to the Committee via ARCHI-ethics@cardiff.ac.uk for consideration and cannot be implemented until the Committee has confirmed it is satisfied with the proposed amendments.

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Documents reviewed by Committee

The documents reviewed by the Committee were:

Document	Version	Date
WSA_Ethics-Review-Application-Proforma_MK_SC	01	23.08.23
PIS_MK	01	23.08.23
Consent_MK	01	23.08.23
Workshops agenda	01	23.08.23
Research Integrity training	01	23.08.23

[Version 00] [Date 07/01/2021]

Complaints/Appeals

If you are dissatisfied with the decision made by the Committee, please contact the Chair of the Committee via ARCHI-ethics@cardiff.ac.uk in the first instance to discuss your complaint. If this discussion does not resolve the issue, you are entitled to refer the matter to the Head of School for further consideration. The Head of School may refer the matter to the University Open Research Integrity and Ethics Committee (ORIEC), where this is appropriate. Please be advised that ORIEC will not normally interfere with a decision of the Committee and is concerned only with the general principles of natural justice, reasonableness and fairness of the decision.

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Yours sincerely,

Dr Eshrar Latif

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[Version 00] [Date 07/01/2021]

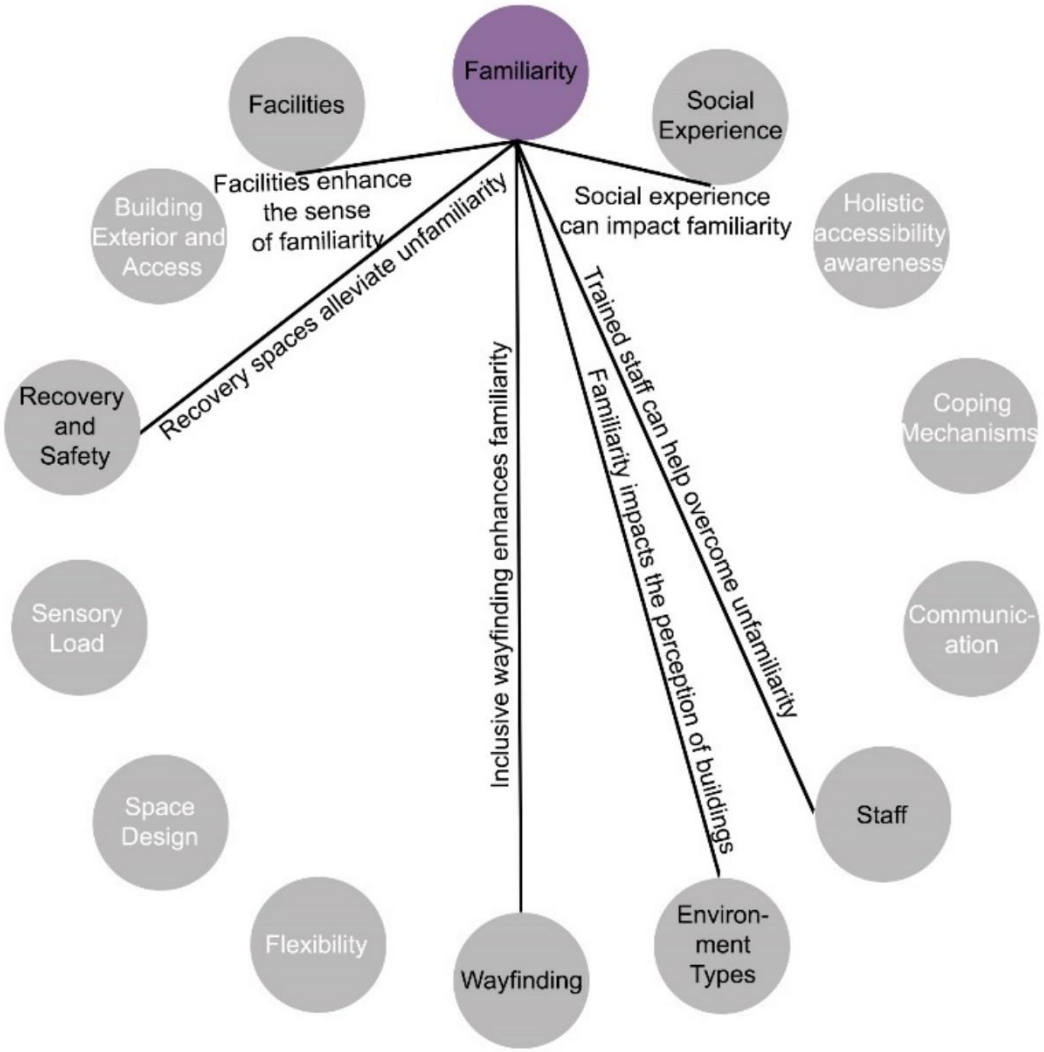
Appendix 6

Architectural insights synergy breakdown

Chapter 8 demonstrated that architectural insights, both tangible and intangible, do not exist in isolation. Instead, they interact in meaningful ways, creating synergies where addressing one barrier often mitigates others. This appendix visually breaks down those synergies to show how accessibility interventions in one area can influence and enhance others. Each diagram focuses on a single insight, mapping its relationships to associated concepts and reinforcing the interdependent nature of inclusive design.

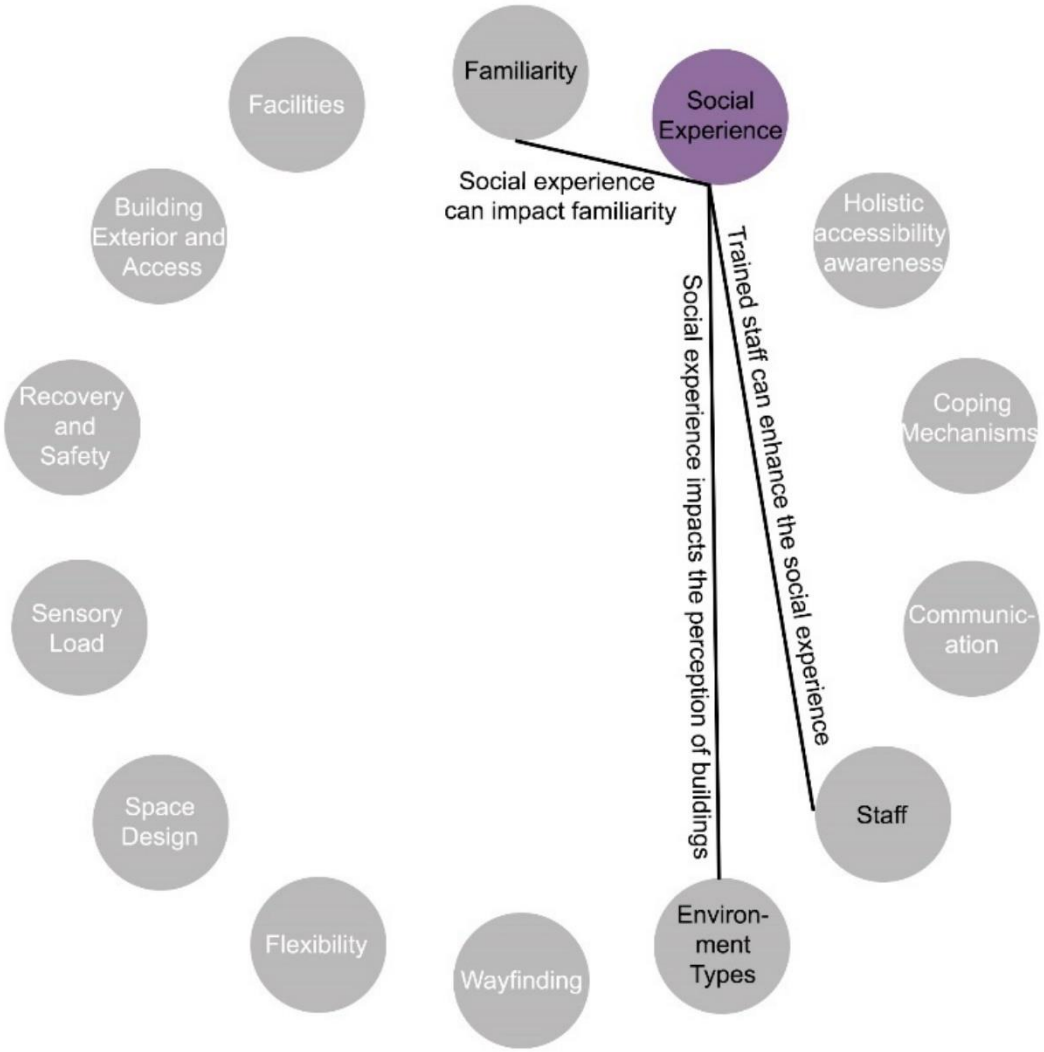
Familiarity

The familiarity diagram illustrates how users' sense of ease and orientation within a space is shaped by several interconnected aspects. Familiarity is reinforced through clear wayfinding, well-designed recovery spaces, trained staff, and recognisable facilities. It is also influenced by social experiences and environmental types, which together shape users' perceptions and comfort levels within the built environment.



Social experience

Social experience affects users' familiarity and perceptions of buildings and is itself influenced by trained staff and the environment types encountered. Supportive staff can enrich the social experience, which in turn shapes how inclusive or alienating a space feels.



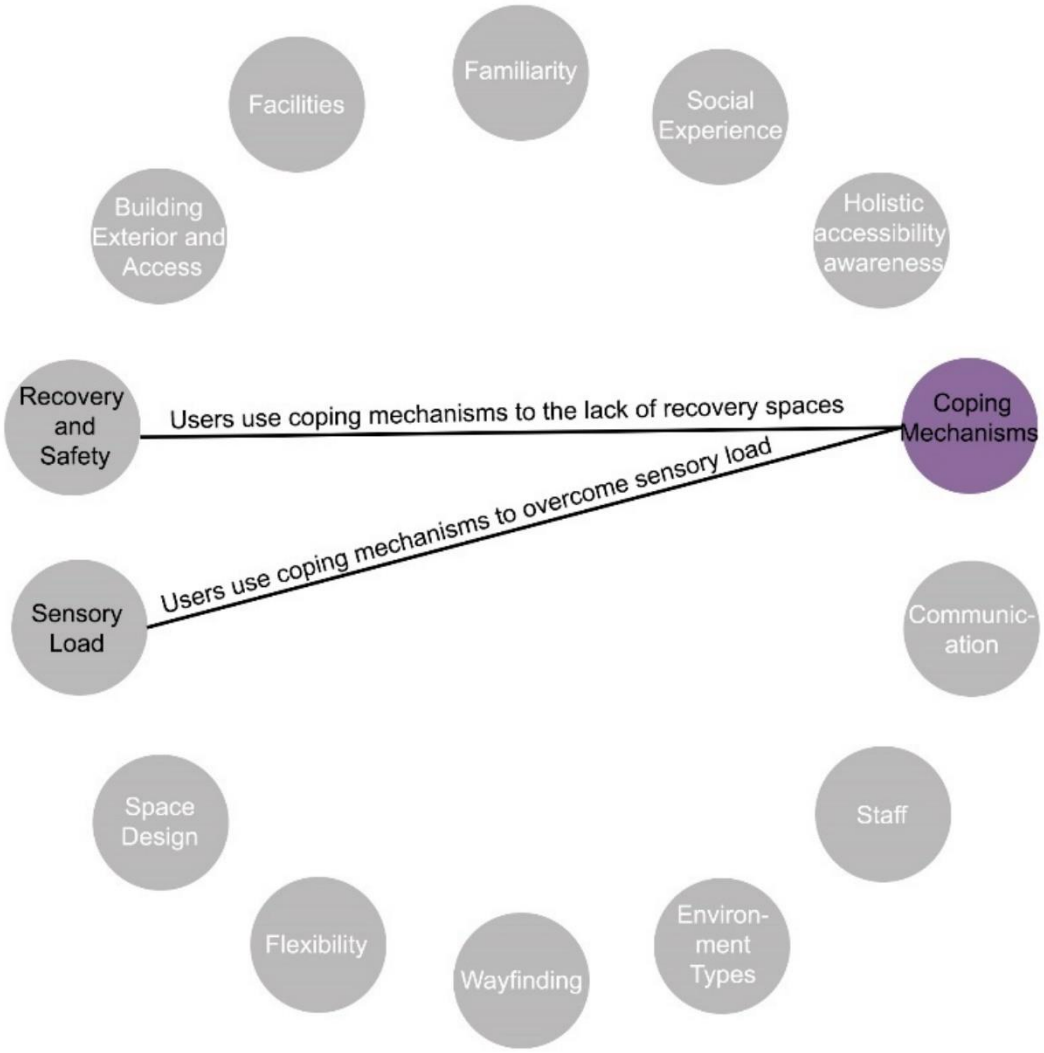
Holistic accessibility awareness

This diagram portrays holistic accessibility awareness as a unifying framework that links diverse elements of inclusive design. It emphasises the need for facilities, recovery spaces, signs, and communication techniques to address a wide range of disabilities. Flexibility plays a crucial role in validating this. The image illustrates that accessibility should not be limited to a single disability but instead considered comprehensively across all user needs.



Coping mechanisms

This visual illustrates how coping mechanisms emerge as a response to inadequacies in the built environment. The image reinforces the need to design environments that reduce reliance on coping by directly addressing underlying barriers.



Communication

This diagram illustrates how communication intersects with various architectural insights. It demonstrates that adequate and diversified communication techniques are crucial for supporting people with a learning disability, particularly when tailored to different cognitive abilities. Effective communication aids wayfinding, helps users reach available facilities, and ensures that recovery spaces are clearly signposted. Staff also play a key role in facilitating effective communication.



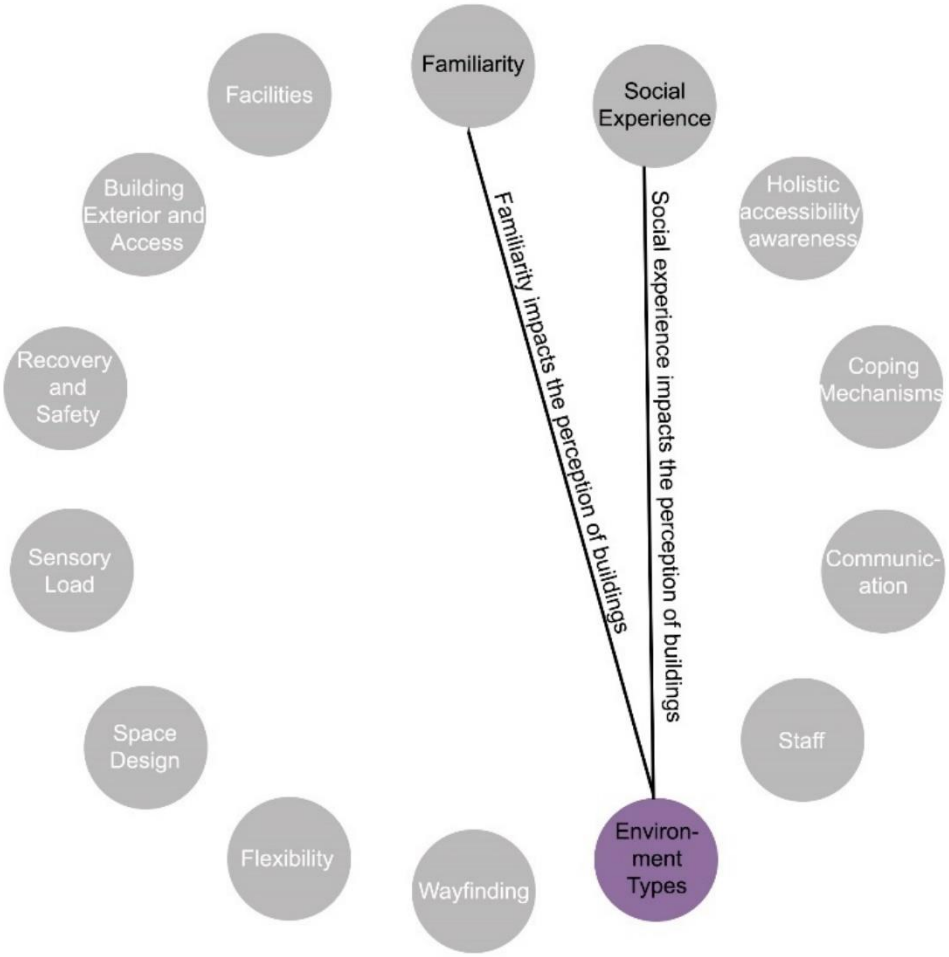
Staff

This diagram showcases how trained personnel contribute significantly to accessibility. Staff can support communication, help manage unfamiliar environments, and guide users toward recovery spaces, thus mitigating sensory challenges and emotional distress. Moreover, trained staff can enhance the social experience and assist in effective wayfinding.



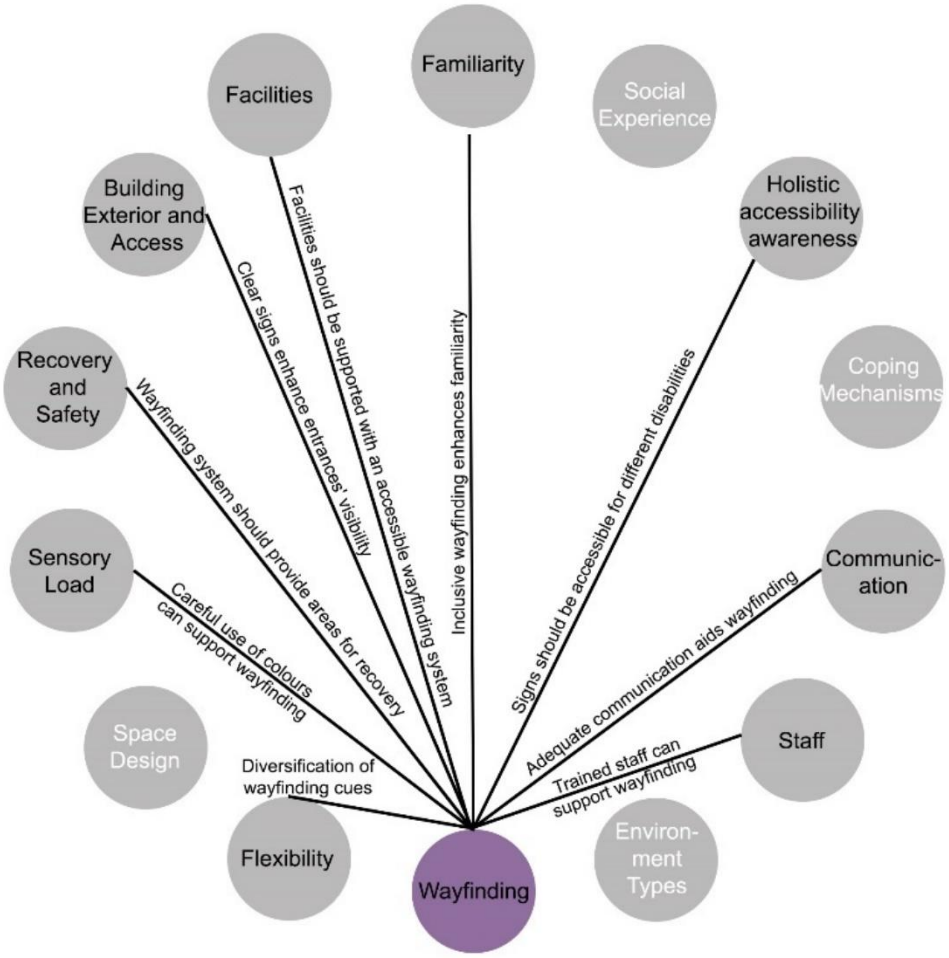
Environment types

This diagram illustrates the impact of building types on user perception, particularly when combined with social experiences and familiarity. Both factors influence how people with a learning disability perceive and interact with different types of buildings.



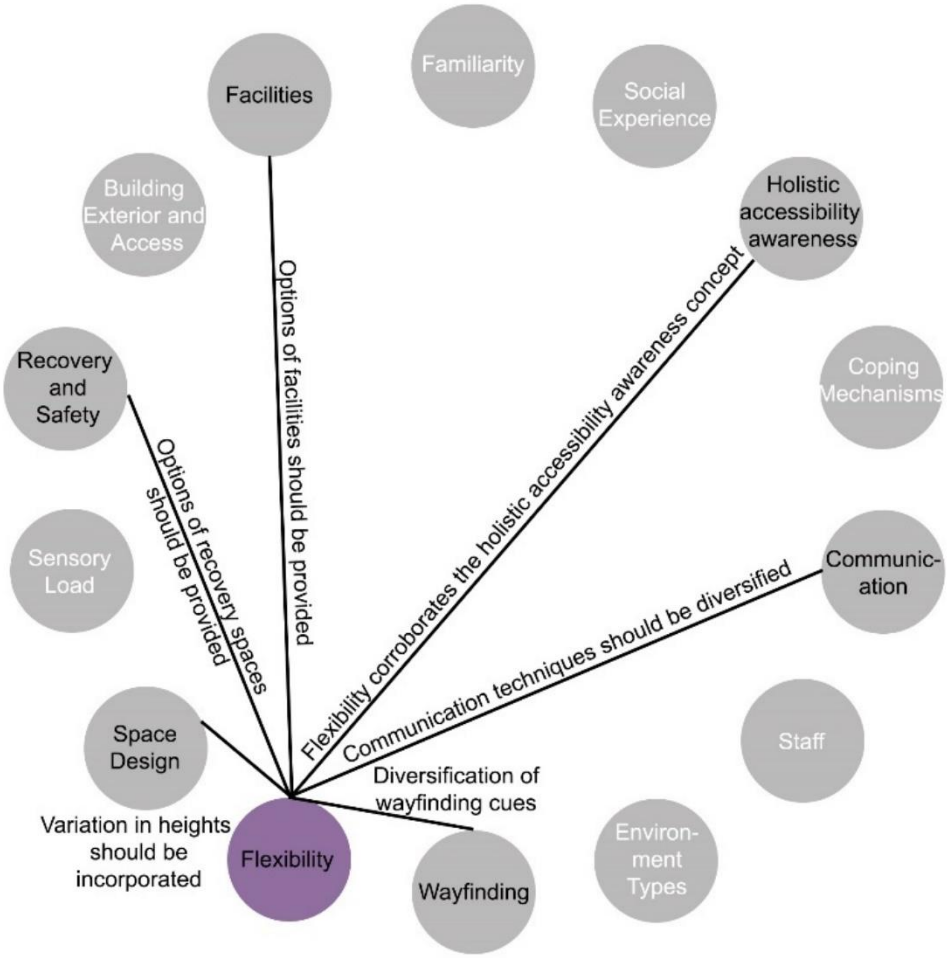
Wayfinding

This diagram illustrates the central role of wayfinding in architectural accessibility. It connects with multiple elements, highlighting its multidimensional nature. Effective wayfinding enhances familiarity and supports communication through adequate signage. It is also essential for identifying recovery areas, especially for those experiencing sensory overload. The use of colour, variation in cues, and integration with clear building entrances all contribute to navigability. Additionally, accessible signage and trained staff improve navigation for people with diverse disabilities, demonstrating how wayfinding intersects with tangible and intangible aspects of the architectural insights.



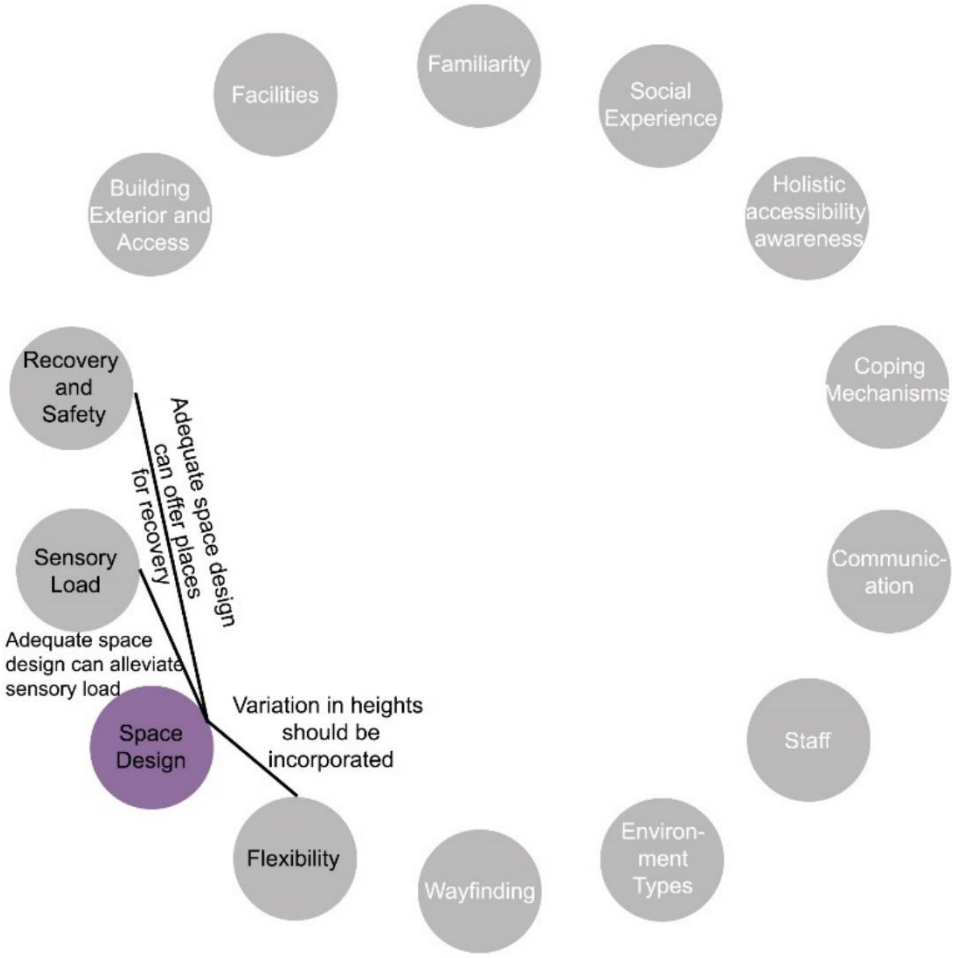
Flexibility

This diagram illustrates flexibility as a principle that reinforces other architectural considerations, especially in creating inclusive environments. It demonstrates how offering varied recovery and facility options supports individual needs, while also corroborating the concept of holistic accessibility. It is also key in communication and wayfinding methods and encourages design elements such as height. In doing so, flexibility emerges not only as an architectural insight but also as an enabling factor for adaptive, inclusive architectural responses.



Space design

The diagram illustrates how space design intersects with recovery and sensory needs. Adequate spatial configurations can provide dedicated recovery areas and mitigate sensory overload. Moreover, flexibility in height variation, enables a more adaptive and inclusive environment.



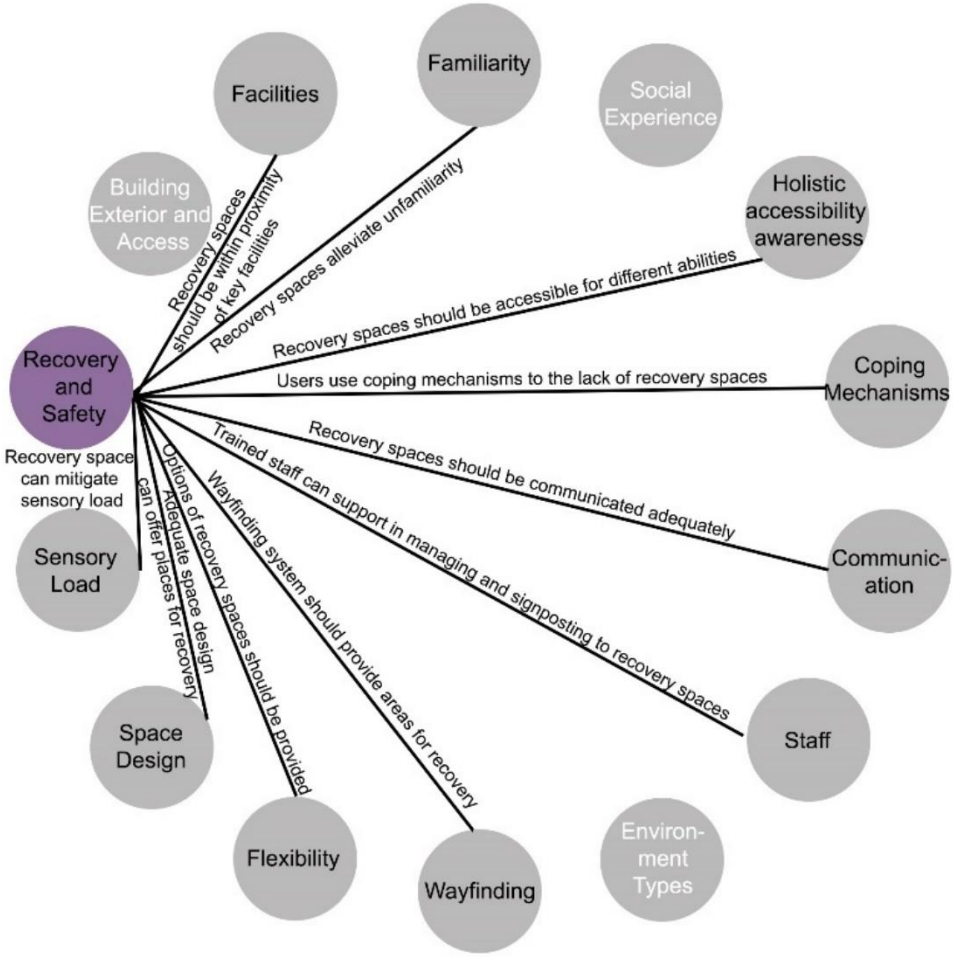
Sensory load

This diagram shows how sensory load connects to several critical factors. Coping mechanisms are often used to manage overstimulation when environments fail to accommodate sensory sensitivities. Recovery spaces serve as essential mitigators of sensory overload, while thoughtful space design, can mitigate the sensory load of crowds. Finally, colour selection can reduce cognitive strain and enhance wayfinding.



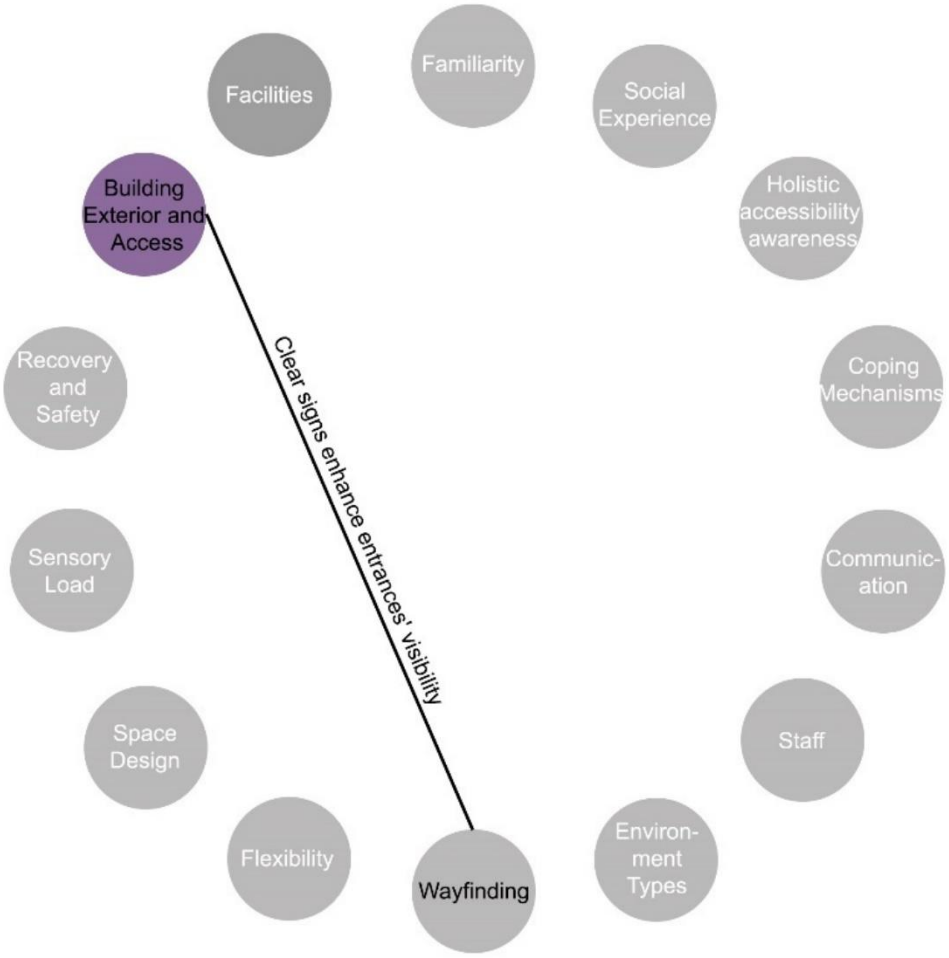
Recovery and safety

This diagram demonstrates how recovery spaces serve as a central component of accessible environments gaining the highest number of connections. It highlights their role in alleviating sensory overload and mitigating unfamiliarity. The figure illustrates that recovery spaces should be accessible to people with varying abilities and clearly communicated through signage and staff support. Their proximity to key facilities and inclusion in wayfinding systems is emphasised as crucial. Additionally, the diagram shows how their absence prompts coping mechanisms, underscoring the necessity for inclusive and well-integrated recovery spaces in design planning.



Building exterior and access

Focusing on the link between building exteriors and wayfinding, this diagram demonstrates that clear signage significantly improves entrance visibility. For people with a learning disability, the ability to easily locate and identify building entrances is a crucial aspect of accessibility.



Facilities

This diagram illustrates how accessible and well-communicated facilities play a crucial role in supporting people with a learning disability. Facilities contribute to familiarity, accommodate various disabilities, and must be supported by accessible wayfinding systems. Their proximity to recovery spaces and provision of diverse options enhance flexibility and independence. Effective communication about available facilities is essential for usability.

