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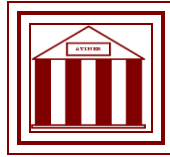
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10 out of 10 for Scottish School Design? - Providing an accessible, sustainable environment for 21st century education

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An Introduction to
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10 out of 10 for Scottish School Design? –
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Abstract

This paper describes an on-going research project which aims to measure the extent to which the social model of disability is embedded within the school design process in Scotland. Proponents of the disability movement have called for societal structures to be reconceived based on the divergent capacities of the individual. The social model of disability can be used to explain the way in which disability is conceptualised as a barrier created by external factors which is imposed over and above an individual's impairment. This model is used as a basis for conceiving a 'social model of architecture' and exploring the progress of architectural practice in responding to change.

The largest school building programme in the history of Scotland has taken place, yet there is no conclusive research evaluating the performance of accessible design. This project investigates the inclusive education discourse in Scotland and its relevance to the built environment, the extent to which best practice guidelines are being met and the degree to which accessibility is considered throughout different stages of the design process. Results will be analysed to discuss the extent to which the social model is embedded within current school design and the case of Scotland's schools will be used to develop a framework for implementation which takes into consideration a holistic view of the entire design process.

Introduction

   This paper describes the initial findings of an on-going research project which aims to identify the extent to which the social model of disability has been embedded within school design in Scotland. The paper firstly outlines the disability movement within Britain and the associated models of disability. This is used as a basis for conceptualising a 'social model of architecture' and discussing the impact of the disability movement on current architectural practice. The paper then outlines the research aims and methodology for the two main parts of the research: (i) a detailed investigation of 10 urban schools and (ii) a large-scale investigation involving schools, architects and local authorities within the 7 cities of Scotland. Finally, the initial outcomes of the research are discussed including relevant themes within the inclusive education discourse, the extent to which best practice guidelines are being met and user satisfaction with the finished building.

The Disability Movement & Emerging Models of Disability

   The disability movement in the UK laid its roots in the 1890s but fully emerged as a movement in the 1960s as a result of the discrimination faced by people with impairments across the globe. The movement led to the spread of groups run by, rather than for, people with impairments who began to politicise issues of income, employment, rights and community living. The movement led to an increase in awareness concerning disability issues, the introduction of anti-discrimination legislation and the emergence of new theories describing the (Campbell & Oliver, 1996; Barnes, 2002). In the 1970s discussions at a meeting between the Union of Physically Impaired Against Segregation (UPIAS) and the Disability Alliance (DA) concerning the Fundamental Principles of Disability led to this definition of disability and impairment:

> 'In our view, it is society which disables physically impaired people. Disability is something imposed on top of our impairments, by the way we are unnecessarily isolated and excluded from full participation in society… It is a consequence of our isolation and segregation, in every area of life, such as education, work, mobility, housing, etc.'
> (UPIAS & DA, 1976, pp.3-4)

Three models of disability have emerged as a consequence of the disability movement. The individual model views the limitations of disabled individuals as being a direct result of their impairment, rather than due to limitations created by society (Oliver, 1981; Oliver, 1983). The social model (Oliver, 1983) places an emphasis on the way physical and social environments impose limitations upon certain groups of people rather than the physical limitations of the individual. This requires changes for society as a whole (Finkelstein, 1980)

and requires professionals to focus on adapting environments so that they do not restrict people with functional limitations (Oliver, 1981; Oliver, 1983). The social model has received some criticism for focusing solely on disabling features and excluding experiences which are related to an individual's impairment. The social relational model (Thomas, 2004; Reindal, 2008) responds to this and acknowledges that an impairment has both personal and social implications for an individual (Thomas, 2004). Table 1 gives an overview of these three models of disability.

A Social Model of Architecture

The vision
In terms of developing a disciplinary model for architecture which responds to the need to reconceptualise structures and processes to enable rather than disable, the social model of disability is considered to offer a more useful premise than the social relational model of disability. This section proposes an outline for 'a social model of architecture' which serves as a basis for discussing advances in current architectural practice. Stiker (1999) argues that in order to achieve equality for people with impairments modern societal structures and processes should be re-imagined, premised on the recognition that the human being has varying capabilities. The challenge for professions involved with the design of the built environment is to identify and remove architectural barriers to make negotiation of built environment as easy as possible for all and develop design solutions which enable rather than disable. For a profession such as architecture, it is important to keep in mind that accessibility involves a totality of life for people with impairments and disability in not just an architectural construct, but a social and political one (Charlton, 1998). While a social model of architecture would include education and research this research focuses on the architectural practice aspects of that model. Figure 1 shows a basic diagram of this model. One of the main reasons that enabling features have not been considered in the built environment could be due to a lack of people with impairments in the design professions. This requires educational institutions to increase the number of students with impairments and architectural practices to employ more individuals with impairments. Education should help to change the view that accessible design is an add-on subject or only relevant to specific buildings or projects. The individual model of disability was largely premised on the beliefs of professionals who imagined what it is like to be impaired. Design professions should be careful not to imagine the problems faced by people with an impairment when negotiating the built environment. Research should seek to identify barriers and create solutions which are premised on the experience of people with impairments and not the imagination of the architect. Research should also determine the extent to which design guidelines are implemented in real projects and what can be done to promote their use. A social model of architecture would make the built environment easier for all to use, minimise

future intervention, increase people's confidence to negotiate the built environment, promote inclusion rather than segregation through the shared use of space, and increase independence for people with impairments.

Advances in current architectural practice
The "Disability Discrimination Act" (DDA) was introduced in Britain in 1995 and differed from previous disability legislation in adopting an active approach, making it the duty of bodies responsible for employment, the provision of goods, facilities and services or the disposal or management of premises, to make reasonable adjustments so as not to place a person with an impairment at a disadvantage. The duty to make reasonable adjustments is anticipatory and this strengthens the argument for ensuring the implementation of a social model of architecture. The DDA was updated in 2005 and later superseded by the Equality Act 2010 which brings together previous legislation relating to race, gender and disability. It was not until 2004 when the Building Regulations (Scotland) changed to reflect the requirements of the DDA 1995, when the need for safe, convenient and unassisted means of access to a building was established (Scottish Government, 2006). Part 4 of the Building Regulations (Scotland) states that not all issues which relate to the DDA are covered within the technical handbook and refers readers to three documents concerning accessible design:

- 'BS 8300: 2009 – *Design of buildings and their approaches to meet the needs of disabled people – code of practice*;
- *Inclusive Mobility* – Department of Transport, 2002;
- *Guidance on the Use of Tactile Paving Surfaces*, published jointly by The Scottish Office and the Department for the Environment, Transport and the Regions (DETR).'

<div align="right">(SBSD, 2011, Section 4.1.0 Introduction)</div>

These documents provide best practice guidance and are not mandatory. Many designers and builders may only build to meet minimum requirements (Imrie, 2006) meaning that issues outwith the scope of the building regulations will not be considered. Goldsmith (1997) argues that standards and codes of practice around the world convey the idea that only people with impairments are disabled by architectural features and that suitable provision could be tacked on without disturbing the design concept. The tendency to segregate people with impairments in the western world may lead designers to view best practice guidelines as only applicable to special buildings or places designed for the use of people with impairments rather than something that is necessary for all designs. Research is needed to measure the extent to which best practice accessible design guidelines are being met and what is preventing them from being met in certain areas.

The disability movement and legislation which has been passed as a result of this movement has had an impact on the way in which architects consider the human being. The *Metric Handbook: Planning and Design Data* (Littlefield,

2007) has been updated twice since its original publication in 1979 to reflect changing building regulations and standards of good practice as well as design agendas such as access for people with impairments. Chapter 2 includes a section on anthropometric data which details people using wheelchairs, crutches, sticks and walking frames. This data is representative of a movement within the architectural community to acknowledge the varying nature of the human body. However, there is a tendency to consider people who have mobility impairments over cognitive or sensory impairments. This is demonstrated in Chapter 2 of the *Metric Handbook* which states that 'The principal disabilities of concern to the architect are those that mean the person has to use a wheelchair for most or all of the time' (Littlefield, 2007, 2-8). The majority of ergonomic measurements and information are concerned with wheelchair users rather than for example a person with a visual impairment using a mobility aid or walking with a sighted guide. Reference to 'Provision for blind people' is only concerned with signage and lifts (Littlefield, 2007, 4.01). This contrasts with Chapter 44 (Smith & Dropkin, 2007) which advises the reader to "Consider the needs of all disabled people not just wheelchair users, who form a small percentage of such a diverse group of people" (Smith & Dropkin, 2007, 2-1). This tendency may stem from the belief that it is more possible to provide design solutions for people with mobility impairments. For example, Goldsmith (1997) argues that it is people with a locomotor impairment who are the most vulnerable to disablement when using public buildings and who the architect can most effectively help. White (2010) argues that the built environment is just as disabling for people with a visual impairment, citing the dangers that can arise from unmarked street furniture and level changes, and identifies design solutions which can enable users with varying types of visual impairment. This shows that much research is still needed in understanding the experiences of people with varying types of impairment and identifying design solutions which can negate these problems. It is equally as important to ensure that best practice guidelines are understood and are being met in the majority of building projects as opposed to one-off building specifically for the use of people with impairments. The evaluation of current guidelines can also help to identify gaps and areas for improvement.

Research Investigations

Aims & Methodology
The biggest school building programme in Scotland's history has taken place from 2000 to 2011 to extensively refurbish or replace over 570 schools, constituting 21% of the entire local authority school building stock (Scottish Government, 2009). The following years will see the extensive refurbishment or replacement of schools which remain in poor or bad condition, which according to Scottish Government statistics (Scottish Government, 2010) could be as many as 546 schools, or 21% of the school estate. The Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002,

which came into force in 2003, requires the bodies responsible for education to prepare and implement accessibility strategies which anticipate and plan for the needs of pupils with impairments with regards the curriculum, information and physical environment of the school. At the moment no conclusive research has been undertaken regarding the design performance of special schools or the performance of accessible design in these new and refurbished mainstream schools. The most comprehensive study of new and refurbished school buildings in Scotland, *Improving the School Estate* (Audit Scotland, 2008) did not include any special schools but it was found that, in mainstream schools, design aspects relating to accessible design are underperforming. These include issues such as insufficient wheelchair provision (George Street Research, 2007a, p.19), difficulty moving through the school building (George Street Research, 2007a, pp. 20 & 22), and a general lack of space in classrooms, corridors and social spaces (George Street Research, 2007b). One of the main findings was the poor quality and control of environmental aspects such as lighting, acoustics, air quality and temperature. These factors are proven to have a detrimental impact on all occupants, however it is argued that this can be far worse for people with an impairment and/or additional support needs (Grierson & Hyland, 2013). This research will establish the extent to which the social model of architecture is integrated within the school design process. The case of Scotland's new and refurbished schools will be used to propose an implementation framework for advancing towards this model. Four main objectives have been identified:

- To examine the issues surrounding inclusive education in Scotland and how these inform accessible design
- To establish whether current best practice accessible design guidelines are being met
- To explore if accessibility is fully integrated throughout the design process
- To produce recommendations to improve accessible design in schools that are applicable within (but do not deny the need to change) existing socio-political parameters and take into consideration a holistic view of the entire design process

Practical Investigations

   The practical research investigations have been split into two main areas: (i) a detailed study of 10 schools within Glasgow, which involved visual surveys of school premises and consultation with members of staff and pupils, and (ii) a large-scale study involving head teachers, architect and local authorities in the 7 cities of Scotland. The research has focused on the main population centres of Scotland and focuses on urban areas (rather than rural) where children with impairments are more likely to be educated in special schools (Riddell, 2006). In terms of the school building both primary and secondary schools were included, although most new and refurbished school buildings are primaries and the majority of responses are therefore from this sector. Both mainstream

and special schools were included as accessible design is equally important in both. In order that results are relevant to current legislation and guidelines only schools built after 2003/2004 have been included as there was no obligation on local authorities to consider accessible school design until 2003 when the "Education (Disability Strategies and Pupils' Educational Records) (Scotland) Act 2002" (Scottish Government, 2002, Section 1) came into force and required local authorities to prepare and implement accessibility strategies to increase access to the curriculum and physical environment. In addition, the Scottish Building Regulations did not change to comply with the Disability Discrimination Act (DDA) 1995 until 2004. The detailed study has been undertaken in Glasgow, which is the largest city in Scotland with the biggest population of people with impairments (ScotPHO, 2010) and the highest number of pupils 'assessed as having a disability' and 'declared as having a disability but not assessed' (Scottish Government, 2012, Chart 2). Glasgow also has a higher percentage of special schools when compared to other Local Authorities (Scottish Government, 2012, Table 5.3).

Initial Outcomes
Inclusive Education in Scotland
   It has been found that in terms of social and political factors affecting accessible school design perhaps the most important debate concerns the practicalities of inclusive education. Priestley (2003) comments that the principles of inclusion are agreed upon at least rhetorically throughout the world, however practical achievements remain irregular. Riddell (2006) discusses the debate surrounding inclusive education in Scotland, explaining that while some parents are fighting with local authorities for their child to have access to mainstream education, others see special education as preferable, viewing the support their child will receive as far superior. In deciding on what type of education to provide disabled children, and in what location, it is evident that the voices of disabled children and their parents, and a discourse of disability rights more specifically, have tended to be marginalised (Riddell, 2009). This type of debate has a direct impact on the type of school accommodation that is provided. At the moment local authorities are building special schools which share a campus with mainstream schools or special units that are situated within, and run under the same management as, mainstream schools. As this debate progresses, the solutions which are provided at the moment may become out-dated and it is therefore crucial that the type of accommodation to be provided is debated between the local authority, the school, parents and children before decisions are taken. At the moment there appears to be minimal consultation being undertaken concerning this debate.

Meeting Best Practice Guidelines
   The results of the detailed study have shown that that while there are examples of excellent accessible design solutions not all best practice guidelines are consistently being met. A review has been compiled in the

format of an access audit report, some examples of which are briefly detailed here. With the exception of one refurbished school, all schools have level access entranceways and level access to all accommodation located on the same storey. An effort has also been made to maximise daylight within the school building, with some upper floor classrooms having skylights along the interior wall, as shown in Figure 2. Exemplary design features include retreat areas incorporated into classrooms within a special school shown in Figure 3 which provided a supervised area for children to have time on their own and also increase the number of corners in the classroom which are preferred by many children. The majority of schools had colour contrasting stair nosings and some had handrails placed at a lower height for children. However, none of the schools had tactile corduroy hazard warning surfaces at the top and bottom of stairways and it was common for the handrail to suddenly change height which may be confusing for someone with a visual impairment or cause a problem for someone using the handrail for support. Columns were not painted to contrast with the background or have colour contrasting bands and only some accessible toilets contained colour contrasting fittings, a feature which would be useful in all toilets to facilitate use by visually impaired pupils. There was a general lack of hearing aid facilities and some staff commented that acoustics in larger areas such as the sports hall or dinner hall were not suitable for pupils with a hearing impairment. Storage space at all schools was lacking but especially in some of the special schools where pupils use mobility equipment, meaning that valuable classroom and circulation space is used. At some schools there was also a lack of space for one-to-one and group work with pupils who have additional support needs. External areas were found to be far behind in terms of meeting best practice guidelines than the school interior. This suggests that this area is not as high a priority and perhaps not as well understood as the building interior. Furthermore, no effort appears to have been made to improve the accessibility of the areas surrounding school buildings with a general lack of accessible crossings and dropped kerbs. This is important as children are encouraged to walk to school and it is government policy to increase community facilities in school buildings.

Design Process

   Many issues which impact on accessibility occur at various stages of the design process. For example the site topography was a main issue in many of the schools and could only be partially resolved by the architect. The development of the brief is also crucial as it decides the type and size of accommodation to be provided. Some schools are overcapacity and have to use their general purpose rooms as permanent classrooms, losing out on valuable space in which to teach children with additional support needs. There is a tendency to save on space by providing a joint-use dining and assembly hall which is also used as a through-route, having no separate corridor. Building users commented that this space was often far too small and that people feel uncomfortable walking through when it is in use, deliberately avoiding it by taking the stairs to use the corridor above. The parents of a child with autism

complained that walking through this space was unsettling for him. Overcrowding in the space and lack of a clear route through could also present problems to a person with a visual impairment or someone using a mobility aid. The consultation process appears to vary depending on local authority with some staff not being involved at the stage of developing the brief. Certain issues may also relate to quality of construction, such as sudden changes in the level of handrails which are meant to be continuous and stair nosings which are falling off. This reinforces the idea that accessible design should be considered throughout the entire design process and is the responsibility of the entire design team. At the moment there is no framework for ensuring accessible design throughout the entire design process and it is apparent that best practice design guidelines are not being met with much depending on resources and enthusiasm in each local authority.

Conclusion

This paper has discussed some of the initial results from an on-going research project which aims to identify the extent to which the social model of disability has been embedded within school design in Scotland. Three models of disability are outlined as a basis for setting out a vision for a 'social model of architecture'. This disciplinary model can help to architects to reconceptualise education, research and practice enables rather than disables. Progress has been made towards achieving this model in terms of amendments to building regulations and the production of best practice guidance, however in terms of architectural practice research is still needed to understand the barriers faced by people with various different types of impairment and to assess the extent to which best practice guidelines are met in the majority of building projects. This research focuses on architectural practice rather than research or education and aims to explore the extent to which the 'social model of architecture' is embedded within the school design in Scotland. Practical investigations include visual surveys of finished buildings, user consultation and interviews with local authorities, head teachers and architects. The initial results of these investigations are summarised and focus on three areas: (i) relevant topics discourse within inclusive education in Scotland and how this can be linked to the built environment, (ii) the extent to which best practice accessible design guidelines are being met and (iii) if accessibility in fully integrated throughout the design process. The case of Scotland's new and refurbished schools will be used to examine the extent to which the social model of architecture is being implemented and propose a framework which can help to implement this model in practice. This framework will be aligned with the Plan of Work produced by the Royal Institute of British Architects, which is the definitive model for design and construction processes in Britain.

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Table 1. *Overview of the three models of disability. Authors own.*

Model	Description	Action
Individual Model	Disability is caused by the functional limitations of an individual.	The individual should adapt to the environment.
Social Model	Disability is caused by the failure of the environment to consider the needs of people with an impairment.	Societal structures and processes should be reconceptualised to enable rather than disable.
Social Relational Model	Impairment is a necessary condition which has personal & social implications. Whether or not impairment becomes disability is dependent on restrictions imposed by society.	Impairment – New treatment & technology. Disability – alterations to societal structures & processes.

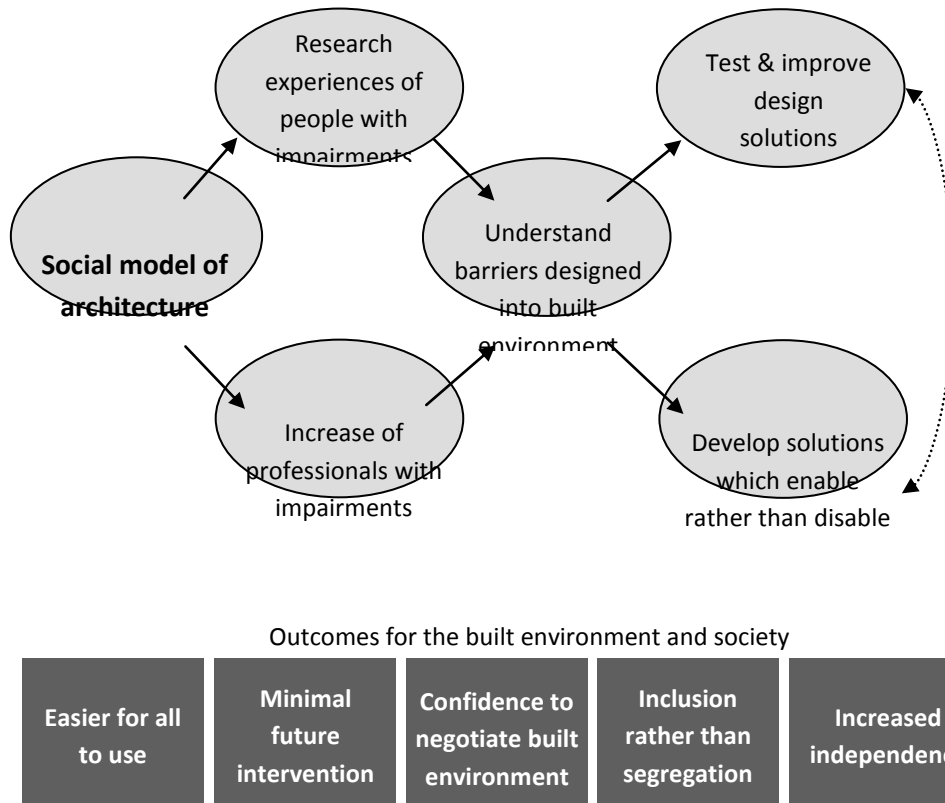**Figure 1.** *Diagram illustrating the social model of architecture*

Outcomes for the built environment and society

Easier for all to use	Minimal future intervention	Confidence to negotiate built environment	Inclusion rather than segregation	Increased independence

Figure 2. *Image showing skylight in interior wall of classroom*

Figure 3. *Image of retreat area in classroom*