
United Kingdom: Environmental design education in a changing world

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Introduction

We argue that developments in other spheres of life have left environmental design less than fully fit for purpose. Dementia is a global issue. Evidence-based environmental design *should* be part of the solution in every country and in all cultures. However, research evidence reflects and reproduces the contexts in which it was created, and environmental design education has too frequently been insufficiently critical of both the quality of the evidence base and its generalisability to other contexts. We provide examples drawn from our experience of the challenges to its delivery in different parts of the world before calling for a new, more nuanced approach to environmental design education which we call 'Designing for context'.

In this chapter we first explore what we mean by environmental design education ('EDE'), present and discuss key aspects of EDE and introduce sensitivity to context. We then present a way to examine differences in the context of EDE before presenting a series of timelines identifying key trends from which we draw examples to highlight ways in which EDE reflects and reproduces context. As an illustrative example, we consider the changing provision of EDE by the University of Stirling's Dementia Services Development Centre (DSDC) which, since 1989, has been at the forefront of critical thinking with respect to architectural built environments for people living with dementia.

Informed by experience, we explore challenges to delivery of EDE in a global context, considering issues around how knowledge which informs EDE is created, translated and

and shared, inviting readers to discuss and debate this topic with us. Finally, we ask whether it is time for a new paradigm in dementia design capable of addressing identified issues.

WHAT DO WE MEAN BY 'EDE'?

We start by clarifying our understanding of 'environmental design' (ED) and 'education' respectively. There is no agreed meaning of ED. Definitions range from the short and literal to those which encompass details of both methodology and goals:

'environmental design [is an activity which] focuses on using holistic, human-centered, and interdisciplinary approaches to create and enable a sustainable life/space ecosystem, including experiences, communication, and places that optimize the interactions of humans with their surroundings' [33].

We favour definitions of environmental design as necessarily interdisciplinary, extending beyond the physical, and concerned with interaction between person and environment after physical structures are in place. In addition, here we are talking about evidence-based activities which incorporate dementia design, a non-pharmacological approach to maintaining quality of life and addressing some behavioural symptoms with the goal of optimising interactions of people living with dementia with their surroundings. For the purposes of EDE we define 'education' simply and broadly as 'an enlightening experience'.

KEY ASPECTS OF EDE

We consider four key aspects of EDE, as set out in Table 1, which provide an aid to thinking about the ways in which EDE is sensitive to wider environmental influences, for example prevailing social norms around the support of people living with dementia, the focus or aim of ED at different points in time and space, advances in information and communications technology, and so on.

Table 1. Key aspects of environmental design education

Aspect	Significance
Who ('the educators')	The identity of the educator, i.e. the provider or facilitator of EDE, reflects which organisations or groups of people in society are perceived to have valued knowledge or understanding of ED at any point in time
What	The content of EDE can point to what knowledge educators perceive as able to bring enlightenment to others, important to share to further their aims or objectives, or perceived as likely to be valued by those to be educated
To/for whom ('the educated')	The identity of the recipients of EDE reflects categories of people or organisations which the educator believes will benefit from 'enlightenment' and/or the categories of people or organisations that consider they or others will benefit from that enlightenment.
How	The methods and media of delivery of EDE reflect and reproduce prevailing norms about how ED knowledge and understanding can and should be imparted (for example, through academic journals, training events, 'grey' literature, completed works such as art and architecture etc).

In the next section we illustrate EDE's sensitivity to context by thinking of context as consisting of multiple dimensions, examination of which provides a means for understanding geographic, cultural, social, and temporal differences in EDE.

KEY TRENDS: HOW EDE REFLECTS AND REPRODUCES CONTEXT

We do not have space here for a full description so to illustrate our concept of context and how it helps to explain differences in EDE over time and space we provide timelines (see Figure 1) and identify key trends influencing EDE across three influential dimensions; understandings of disability; dementia-specific policy; and development of information and communications technologies.

SOCIAL UNDERSTANDING OF DISABILITY

EDE reflects and reproduces prevailing wider social understandings of disability.

Jewson [34] suggests that the 'medical model of disability', in which disability resides in the person and is addressed by 'fixing' their impairment, became the dominant paradigm in the late 19th century. The medical model impacts significantly on the identity of EDE providers by restricting the perceived validity of expertise to medical domains to the exclusion of those living with illness or impairment. As Simon Brisenden wrote in 1986:

'Our opinions, as disabled people, on the subject of disability are not generally rewarded with the same validity as the opinions of 'experts', particularly medical experts' [35].

Building on pioneering work which began in the 1970s [36], by the 1980s a new 'social model of disability' had begun to supplant the medical model.

According to the social model, disability is defined as the disadvantage that results from the failure of society to take the impairments that some people have into account and is addressed by fixing social barriers and not the person. The social model of disability informed the Disability Discrimination Act 1998, a landmark piece of UK legislation which introduced a mandatory requirement to provide 'accessible' environments and which had a profound impact on the built environment. Neither the social model of disability nor the Act explicitly accounted for cognitive disability, but both influenced dementia-related thinking. Authors such as Gilliard, Means [37] have subsequently explored the social model of disability as a framework for thinking about dementia. General acceptance of the social model of disability prompted expansion in academic interest in dementia-related knowledge creation and changed foci across disciplines, both of which feed into the content of EDE.

More recently the 'social relational model of disability' has influenced both thinking around dementia and the content of EDE. The social relational model sees disability as 'a form of social oppression involving the social imposition of restrictions of activity on people with impairments and the socially engendered undermining of their psycho-emotional wellbeing' [38] and draws a distinction between 'impairment effects' and the socially imposed restrictions which constitute disability. Shakespeare, Zeilig [39] draw parallels between influence of the environment on the experiences of people living with dementia and of those living with physical disabilities before asserting that 'a relational model of dementia lays the basis for a human rights approach to the condition'.

The development of Dementia-specific journals provides evidence of the impact of the changing social understanding of disability on EDE. As Table 2 illustrates, the earliest listed, Alzheimer Disease and Associated Disorders, is established in 1987 when the medical model is dominant and this is reflected in the journal's focus on diagnosis and treatment, inhibiting the development of ED. The change from medical to social model as the dominant paradigm sparks interest in dementia from other academic disciplines, and journals established in the 1990s stress the multidisciplinary nature of their content. Later journals service nascent academic communities of interest in non-medical aspects of dementia-related research and, consistent with the social relational model, focus on research exploring lived experiences of dementia.

Table 2. Dates of first publication and purpose at establishment of selected journals

Journal title	Date of first publication	Stated purpose at first publication
Alzheimer Disease and Associated Disorders	1987	'An international forum for reports of new research findings and new approaches to diagnosis and treatment.'
Journal of Dementia Care	1993	'A multidisciplinary journal for all professional staff working with people with dementia, in hospitals, nursing and residential care homes, day units and the community.'
Journal of Alzheimer's Disease	1998	'An international multidisciplinary journal to facilitate progress in understanding the etiology, pathogenesis, epidemiology, genetics, behavior, treatment and psychology of Alzheimer's disease.'
Dementia: The International Journal of Social Research and Practice	2002	'An international peer reviewed journal that acts as a major forum for social research of direct relevance to improving the quality of life and quality of care for people with dementia and their families.'
Alzheimer's & Dementia: Journal of the Alzheimer's Association	2005	'To bridge the knowledge gaps across a wide range of bench-to-bedside investigation.'

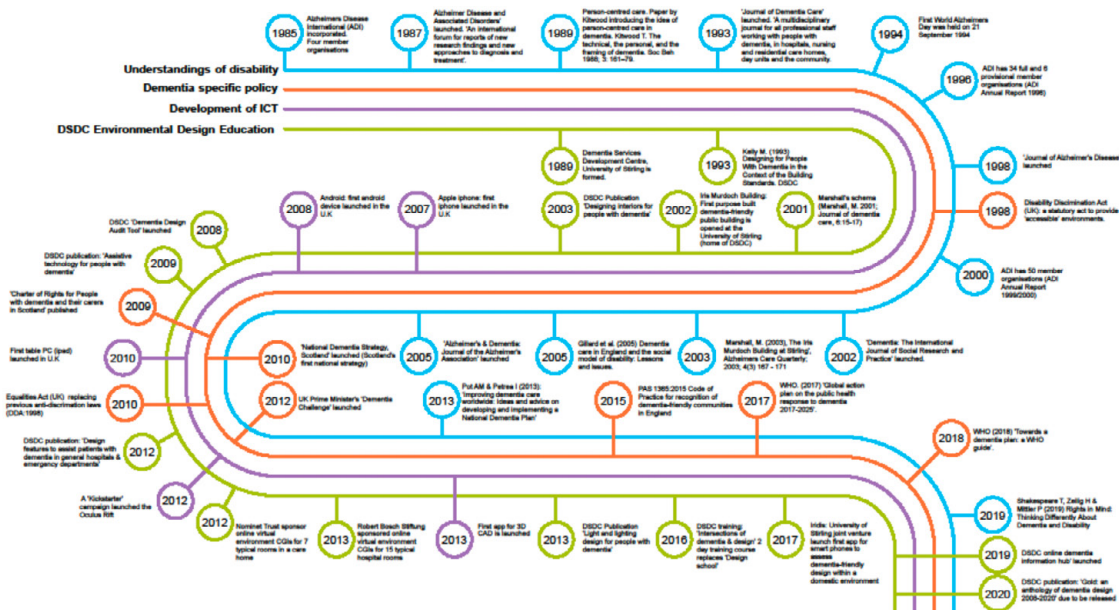


Figure 1: Timeline

Dominant models of disability are also reflected in the language which organisations use to describe themselves, their remit, or their beneficiaries and in EDE itself. For example, terms reflecting the medical model such as 'Alzheimer's victims' and 'dementia sufferers' that were used in the 1980s have since been replaced by those such as 'people living with dementia' which are consistent with social and relational models.

NATIONAL DEMENTIA PLANS

In May 2017, the Seventieth World Health Assembly adopted the WHO 'Global action plan on the public health response to dementia 2017–2025' [40]. The ambition of the Global action plan is 'to improve the lives of people with dementia, their carers and families, while decreasing the impact of dementia on communities and countries' and it sets out seven key areas for action. 'Area 1, Dementia as a public health priority', calls on countries to act on dementia. Dementia action plans reflect awareness and commitment to act to improve the lives of people living with dementia, including in relation to ED.

Sensitivity to context is stressed by Pot and Petrea [41], who suggest that

national dementia action plans, which often detail actions to be taken in relation to ED, 'need to be based on the country-specific situation and context and methods' and to take into account amongst other things 'the needs of people living with dementia and their care-givers,...the services provided by healthcare professionals, and cultural and socio-economic factors'.

By 2019, 31 such plans had been adopted, primarily in higher income countries [42]. Other countries are being actively encouraged to adopt dementia plans by the World Health Organization [43].

'Dementia awareness and friendliness', Area 2 of the WHO Global action plan, has the greatest direct bearing on EDE. Proposed actions for member states in this area include:

'Support changing all aspects of the social and built environments, including the provision of amenities, goods and services, in order to make them more inclusive and age- and dementia-friendly, promoting respect and acceptance in a manner that meets the needs of people with dementia and their carers and enables participation, safety and inclusion' [40].

The Global action plan also sets out complementary actions for the WHO secretariat relevant to EDE in relation to Area 2, which include building on the resources of the WHO Global Network of Age-friendly Cities and Communities in order to:

'integrate and link dementia-friendly initiatives by documenting and evaluating existing dementia-friendly initiatives in order to identify evidence of what works in different contexts and disseminate this information' [40].

DEVELOPMENT OF INFORMATION AND COMMUNICATIONS TECHNOLOGIES

The technological context of EDE has seen rapid change in relation to information and communication technologies ('ICTs'), especially the development and uptake of internet-enabled devices (e.g. personal computers, tablet computers for mobile computing, and smartphones). These developments influence the delivery of EDE and the identities of EDE providers and recipients.

Internet-enabled devices are a relatively recent innovation. Computers for consumer use became available in the 1970s, but the 'world wide web' was not introduced until 1991 and Internet use did not expand significantly until late 1993 [44]. Mobile internet-enabled devices are more recent still, with smartphones really only taking off after the first mass market touchscreen phones were launched: iPhone in 2007 and the first Android device in 2008 [45]. The launch of iPad in 2010 is similarly regarded as the catalyst for subsequent growth in the market for tablet computers [46].

Increasing processing power, sophisticated computer software programmes and mobile applications ('apps') and cloud-based data storage and retrieval systems now allow for new ways of delivering or facilitating EDE,

which in turn influence the identity of educators and recipients. The ability to be able to participate remotely, often at a time and pace convenient to the EDE recipient, provides the potential for educators to offer EDE to recipients irrespective of geographical location and to provide EDE at costs which make EDE attractive to individuals whose interest is personal in addition to those with professional interests in ED. Internet-enabled devices still allow EDE to be delivered as old style direct instruction distance learning, but also facilitate a shift away from face to face and uni-directional modes of learning and dissemination into digitally enabled and (arguably) richer modes of education such as 'flipped classrooms', more dynamic and interactive EDE experiences from virtual or augmented reality, and bi-/multi-directional EDE and learning through collaborative design and co-creation processes.

An illustrative example: The University of Stirling's Dementia Services Development Centre (DSDC)

INTRODUCTION TO DEMENTIA SERVICES DEVELOPMENT CENTRE (DSDC)

The Dementia Services Development Centre (DSDC) sits within the Faculty of Social Sciences at the University of Stirling. It is an international centre for knowledge exchange which for more than thirty years has worked with individuals and organisations to: improve the lives for people living with dementia through design; make communities dementia-friendly and increasingly dementia-supportive and enabling; and influence policy to improve services for people with dementia. DSDC's EDE offering is used to illustrate the effects of changes in selected dimensions of context over time.

FORMATION AND MISSION

DSDC was formed in 1989 with support from the Dementia Services Development Trust (DSDT), a Scottish charitable organisation established a year earlier, to further DSDT's charitable mission. DSDC reflects and works to achieve the aims of DSDT, re-stated with updated language in line with the contemporary context in a 2016 vision statement as:

'To improve the lives of those living with dementia' and its mission as 'To promote the best practice in the development of services of care and support of all those living with dementia and their carers.' [47]

In the beginning there was an emphasis on raising awareness of dementia among health and social care staff, but DSDC now provides 'training, consultancy, undergraduate and postgraduate education and information on dementia for professionals and carers around the world' [48].

EDE AT AND THROUGH DSDC: REFLECTING CHANGES IN SCOTTISH AND UK CONTEXT

Then Director of DSDC Mary Marshall noted in 2003 that 'From its inception in 1989 the numbers of requests for help with design to assist people with dementia have been considerable' [49], and EDE is now explicitly acknowledged as a major element in the work of DSDC. The Centre has a dedicated environmental design team comprising of architects, landscape architect, interior and product designers and services engineers supported by registered mental health nurses and social care practitioners.

In the 1980s the main focus of ED research, literature and design guidance was on institutional care environments and DSDC's early EDE offerings reflected that. The late 1980s saw significant changes in the context within which DSDC was operating. DSDC responded to growing interest in ED with conference presentations and consultancy, and in the early 1990s DSDC offered design expertise through short books published in-house on aspects of ED including: group living for people with dementia [50]; design in the context of UK building standards [51]; and small scale, domestic style, long stay accommodation [52]. The development of 'person-centred care' (53, 54) as a new approach to caring and the Disability Discrimination Act 1998 passing into UK law forced the ED community to focus on issues of accessibility. DSDC's EDE offerings were reconsidered in this context and expanded, with the first 'DSDC Design School' three-day training events held in the late 1990s. The choice of 'Design School' as the descriptor for these events speaks to the primary method of EDE delivery, which was through direct instruction, a method familiar to both educators and recipients which allowed for significant volumes of unfamiliar material to be introduced 'en bloc'.

Increasingly seeing ED as a core part of their educational offering, DSDC were also aware of the differing needs of EDE recipients. Discussing the Iris Murdoch Building ('IMB'), the UK's first purpose-built dementia friendly public building, shortly after its construction in 2002, Mary Marshall wrote that 'Most of our work targets people working in dementia care rather than architects. While the latter can visualize

design features from a plan or description, others really struggle' [49]. DSDC badly needed office space at that time, but the need to provide alternative but complementary ways to communicate EDE for non-architect EDE recipients was also a key driver, and DSDC recognised that the IMB 'presented an opportunity to demonstrate dementia-friendly design'.

IMB has continued to provide a practical example of dementia friendly design, but changes in context over nearly two decades, including working time poverty of professional participants and increased expectations of participant-centred and peer group learning, interactivity, and technology mediated course content, prompted radical re-thinking of the 'Design School' model of EDE delivery. In 2016 DSDC replaced 'Design School' with 'Intersections of dementia & design', a new 2-day training course incorporating a mix of learning activities intended 'to redress the balance between dementia care and dementia design by focussing on the complex combination of the individual, dementia and the built environment'.

Key developments in the availability and use of information and communications technologies (ICTs) and the expansion of EDE recipients from primarily professional recipients to a far more varied population which includes informal carers and people living with dementia have driven changes in the delivery of EDE at DSDC. For example, in 2012 the Nominet Trust sponsored the development of online virtual environment CGIs for 7 typical rooms in a care home and a year later the Robert Bosch Stiftung sponsored online virtual environment CGIs for 15 typical hospital rooms. Both sets of virtual environments are accessible to all via the DSDC website. In 2017, the University of Stirling were partners in the development of Iridis, an iterative built environment application for mobile devices which allows homeowners and professional users to assess the built environment against the DSDC's Dementia Design Audit Tool [55] and upload results to enable 'practice informed research'.

Most recently, in 2019 DSDC has launched the 'DSDC online dementia information hub' [56] The hub was developed to complement a series of free, 4-hour informal educational workshops delivered as part of a project with local partner organisations designed 'to address a notable gap in the provision of dementia education for both informal carers and those in volunteering roles'. Both the workshops and the online information hub provide EDE.

The dimensions of context explored in section 2 and illustrated in relation to EDE provided by DSDC in section 3 have led to a

framing of people living with dementia as individuals with the same rights to participation in society as anyone else but subject to a range of socially imposed restrictions to activity which limit their ability to exercise those rights.

At the same time, dementia is now firmly established as a global priority and one to which nations are increasingly responding with action plans which impact on EDE. Added to this, the widespread availability and use of ICTs has allowed a widening population of professional and informal consumers of EDE around the world to access and act on available digital content. Section 4 reviews the challenges to delivery of EDE which this presents.

CHALLENGES TO THE DELIVERY OF EDE IN A GLOBAL CONTEXT

Much of the ED design guidance currently available has been developed in and/or is underpinned by research undertaken in developed countries and informed by Occidental culture. This can present challenges to the delivery of EDE in a global context and from our experience of working with international clients, including in India, Japan and Nigeria, we outline the key challenges. These evidence

a pressing need for critical discussion of the research evidence base and its global generalisability and encouragement of new research reflecting global diversity.

LANGUAGE

At first this may seem an obvious challenge which could easily be overcome, for example by employing the services of a translator. However, used here 'language' relates to both linguistic systems and to abstract concepts influenced by emotion, time and social context. Changing contexts have led to abandonment of certain words (senile, demented, patient, sufferer etc.) and adoption of other more inclusive terms in some places, but this is not uniform across cultural contexts.

In addition to the cultural sensitivity of the terms used to describe dementia, ED incorporates several professions which are technical in nature and involve

domain-specific terminology. EDE needs to be culturally sensitive and able to adopt industry specific terminology. This requires a close working relationship with international partners to ensure language is both culturally and technically appropriate and the EDE is relevant to the wider context.

LOCAL VERNACULAR

EDE is itself a product of globalization. In many countries, memory shelves, contrasting toilet seats and applied signage are all too familiar. However, one only has to view the building orientation, form, elevations and use of materials to see how the local vernacular (climate, density, availability of materials and cultural practices) influence the overall design.

The local vernacular and technical codes which govern ED vary and are not always compatible to the geographic origins or age of research evidence. This is self-evident when considering a global context but can also be true within federalised countries or across member states of larger unions. Therefore, it is essential to understand the design context and to be sensitive to how differences in context shape the application of core dementia design principles. For example, within the United Kingdom statutory regulations and regulatory bodies for care vary between member countries, prompting DSDC to publish guidance identifying conflicting regulations and providing recommendations.

To address this,

we have found that global EDE is more effective when distilled to design principles as opposed to descriptive technical requirements.

This in itself can be challenging for the provider because recipients of EDE are often seeking technical solutions to everyday situations. The use of precedent examples is helpful, but care is needed to ensure that the EDE recipient does not assume this to be the definitive solution, ignoring local context. Where EDE provider and recipient work collaboratively a design solution can be developed which acknowledges the research evidence base (the core principles) and is fit for purpose (designed to the local context).

EDE is and should be a critical practice and we advocate for an approach similar to that of critical regionalism [57]: inspired by and responding to the local context whilst maintaining a discrete recourse

to globalization, and the global evidence base. Such an approach facilitates innovation and creativity and ensures the solution is designed for context.

A DESIRE FOR DETAIL

Over the past 30 years considerable ED research has been undertaken. Early research focussed on and assessed general aspects of ED such as scale of care setting, safety features, wayfinding and orientation, visual access, colour and outdoor space. Key trends in research foci are reflected in DSDC's EDE content, enabling changes to be tracked (refer 'Key Trends' timeline). For example, in 2003 DSDC EDE reflected research focus on design of interiors. Since then we have witnessed an increasing demand for EDE to provide greater certainty, quantitative outcomes and detailed explanation of their application, and more recent publications on 'light and lighting design' (2014) and 'air quality' (2016) reflect increasing EDE recipient demand for and thus research concern with depth and detail.

Recent foci for research interest, such as the effects of bright light interventions, ambient assistive technologies, smart buildings and artificial intelligence, reflect deeper awareness of the interdisciplinary nature of ED but also speak to a turn towards the use of innovative technologies in ED. This presents a challenge because the speed with which society demands information in this hyper-connected, digitised world is not always compatible with the time needed to design, implement, analyse and publish research and the evolution of EDE is reliant on a suitable 'pipe-line' of quality research.

DOMINANT ENVIRONMENT

Research into the impact of the built environment on people with dementia has favoured care environments with less research undertaken in hospitals, public buildings or people's own homes.

Studies tend to prioritise certain research designs or to focus on specific rooms or areas within the environment [58] and these tend to reflect key trends in global attitudes towards dementia. This has led to the emergence of a dominant environment in EDE (the care environment) and a gap in environmental design research.

The Iris Murdoch Building was recognised as the UK's first purpose-built dementia-friendly public building (c.2002). At the time Marshall acknowledged the need for a design exemplar which could:

'show dementia design features for any age, cohort, any cultural background, and any level of disability' [49]

However, in the UK increased interest for wider adoption of dementia-design principles into public buildings, work environments, leisure and community buildings was not apparent until 2012, following the launch of the UK Prime Minister's 'Challenge on Dementia'. It was not until 2019 that DSDC awarded its internationally recognised accreditation for dementia-friendly building design to the UK's second purpose-built dementia-friendly public building (Great Sankey Neighbourhood Hub in Warrington, UK, designed by Walker Simpson Architects for Livewire CIC).

PHYSICAL VERSUS PSYCHO-SOCIAL ENVIRONMENT

Physical and psycho-social environments are intricately interrelated and therefore EDE must also acknowledge the care relationship / care model. Fleming highlights the challenge of undertaking ED research in care settings, stating that:

'It is the difficulty of teasing out the relative contribution of the physical environment and the staff-resident interactions which is most central to the problem' [59].

This point is reinforced by Bowes and Dawson, who note:

'The research on care homes highlights the importance of the approach to care, and the difficulties of separating out the impact of design features from that of the model of care delivery on the quality of care' [58].

As noted, research into the impact of the environment on people living with dementia has predominately been undertaken in Occidental cultures where similar person-centred care models dominate. This increases the complexity of providing EDE in countries where the care model is different and has the potential to conflict with person-centred environmental approaches to ED.

TIME FOR A NEW PARADIGM IN DEMENTIA DESIGN? AN OPEN INVITATION TO DEBATE

In starting this discussion, we set out our definition of ED as a human-centred, interdisciplinary approach to creating a sustainable ecosystem which encourages interactions between humans and their surroundings informed by an evidence-based focus on design for dementia and we adopted a broad and inclusive definition of 'education' as an 'enlightening experience'. In mapping the methods and media of EDE as informed by three dimensions (social understanding of disability; dementia action plans; and development of ICTs) across a 30-year period we have illustrated EDE's sensitivity to wider context and outlined some of the challenges of EDE on a global stage.

We posit that EDE and the evidence base which underpins it, reflect and reproduce the contexts of production and that to date, this has privileged certain environments and cultures. It is not optimal to replicate EDE for people with significantly different context-dependant lived experiences. A nuanced understanding of context is critical to designing for people living with dementia in different international contexts, suggesting a need for

a new paradigm in ED; one which reflects emerging human rights-based perspectives, is critical in its practice and embraces global diversity in its application.

We refer to this approach as 'Designing for Context'.

'Designing for context' recognises the multi-faceted needs of people with dementia and rejects an assumed homogenisation in favour of considering the needs of one person with dementia as being unique to the needs of another individual, and represents a starting point in the development of a more context-sensitive approach to ED and EDE. It takes into account the different political, economic, socio-cultural, technological and legal environments which make up country specific contexts around the world and which influence design and human behaviour.

We welcome robust discussion and debate on the detail of this approach.