Implementing Sensory Design for care-home residents in London

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Abstract: Within dementia care, there is a need to facilitate appropriate sensory experiences and opportunities for meaningful engagement for people living with dementia, particularly in later stages. As such, the provision of multisensory environments designed to meet the needs of these individuals and offering suitable occupation and stimulation, have increasingly gained significance.

In this context, this paper explores the meaning of experience-focused, sensory design and the importance of appropriate sensory stimulation for wellbeing. It refers to recent interdisciplinary research in this area and a new guide advising on design of sensory enhanced spaces in residential dementia care.

The primary focus of the paper is a case study showcasing the implementation of sensory design, based on these guidelines. The case study reports on the co-creation of a sensory, experience-focused space for residents with dementia in a London care-home. Based on this example, the paper highlights the value and impact of appropriate sensory design on the wellbeing of people with dementia and their carers.

The conclusion discusses the learning and knowledge gained from this process as well as perspectives on further research activities including the analysis of user feedback and evaluation of the design intervention.

Keywords*: sensory design, sensory deprivation, multisensory environment, co- design, dementia care*

1. Introduction

Within dementia care, there is an urgent need for cost-effective interventions to facilitate appropriate environmental designs that enable individuals living with dementia to (re)connect with people and places and reduce isolation, maintain dignity, re-gain a sense of belonging, purpose and accomplishment. As such, the provision of multisensory environments that are tailored to the needs of people with dementia offering suitable stimulation and fostering a sense of wellbeing, have increasingly gained significance. Yet, there still exists a considerable knowledge gap amongst care practitioners regarding appropriate sensory design of such spaces (Jakob & Collier, 2017). The authors therefore emphasise that this needs to be addressed to help people living with dementia avoiding sensory deprivation.

1.1 Sensory deprivation in people with dementia

Sensory deprivation is a phenomenon where stimulation to the senses is greatly

reduced leading to a significant decrease in wellbeing and health (Kovach, 2000). Symptoms of sensory deprivation include features that are also common in the later stages of dementia, such as disorientation, irritability, confusion, lethargy, depression and hallucinatory phenomena (Zubek, 1969), as well as self-stimulating behaviour (Vozzella, 2007).

People with dementia, particularly in later stages, are often at risk of sensory deprivation because of their limited ability to sufficiently access or process sensory stimuli. This may be due to sensory changes (reduced acuity of the senses vision, hearing, taste and smell), deterioration of cognitive skills (loss of social skills and executive functioning) or environmental restrictions as experienced in residential care or living alone (MacDonald, 2002). Contrary to this, being exposed to too much sensory stimulation, e.g. in a care-home environment where common areas can be very busy and no spaces to retreat, can also result in sensory deprivation as the person with dementia may find it difficult to understand and process the information received (Bowlby, 1993) and retreat into shutdown e.g. closing their eyes.

Although the dementia disease process leads to a loss of cognitive function, the sensory and emotional processing areas of the brain remain relatively intact. Appropriate sensory stimulation therefore can potentially impact on these sub-cortical structures to induce a calming effect thereby mitigating some of the characteristics of dementia (Collier et al., 2010). Creating multisensory experiences through environments and activities designed to address the sensory needs of the individual should therefore be seen as essential in dementia care.

1.2 Sensory design

“What if we designed for all our senses? Suppose, for a moment, that sound, touch, and odor were treated as the equals of sight, and that emotion was as important as cognition. What would our built environment be like if sensory response, sentiment, and memory were critical design factors, more vital even than structure and program?” (Malnar and Vodvarka, 2004, p. ix)

The term ‘Sensory Design’ describes an approach that considers the impact of objects and the built environment on all our senses (vision, hearing, touch, taste, smell and movement). As such the focus is on the sensory/sensual rather than the cognitive. Sensory design explores how multisensory properties of materials, objects, and environments, and sensations such as temperature, vibration and pressure affect the overall user experience and perception. It pays attention to awareness and sensory capacities (Malnar & Vodvarka, 2004) and considers the impact on users (e.g. feeling safe or inspired) (Schifferstein, 2011). By utilising sensory qualities and stimuli to the benefit of a healthier mind and body, a sensory-focused approach can enable solutions that improve user experience and contribute to enhanced wellbeing. Designed environments that reflect the specific sensory needs of the user, are more holistic, user-centred, and inclusive, leading to a deeper response and personal engagement.

In recognition of the benefits of designing for end-user experiences, this approach has now also permeated healthcare environments. For example, the Marjory Warren dementia ward at King’s Hospital in London was transformed into a dementia-appropriate environment by introducing adapted lighting, different textures, material, colour and imagery to support independence, social inclusion and participation, and feelings of safety, pleasure and calm.

2. Guidelines for designing sensory enhanced spaces for people with living dementia

Within this context, interdisciplinary research evolved considering the role of design in dementia care and its potential impact on wellbeing of individuals with dementia. Investigations focus on provision of sensory enhanced environments and meaningful sensory activities for people living with dementia in UK care-homes, in particular the use of Multisensory Environments (MSE), also referred to as Sensory Rooms or Snoezelen[1] , (Jakob & Collier, 2017).

Academic studies have shown that the use of MSE in dementia care can achieve a number of benefits including improved function and alleviated behavioural, psychological and emotional symptoms (Collier et al, 2010; Maseda et al, 2014). As a result, and in attempt to provide solutions to the problems described in section 1.1, Sensory Rooms were installed in numerous care-homes in UK within the last 15 years. However, these spaces were often under-used and locked up (Dalke & Corso, 2010) because they had been installed with little thought of their design and use. Therefore, this recent research explores how the performance and success of such spaces can be improved through design to the benefit of care-home residents, their relatives and care-givers.

[1] Developed in the Netherlands in the 1970s as a non-cognitive leisure activity for people with severe learning disabilities (Hulsegge & Verheul, 1987), the Multisensory Environment (MSE) aims to provide an enabling, stress- free, positive environment offering both stimulation and relaxation on a sensory level. Since then, the concept has been applied with a range of user groups including people with autism, stroke recoverees, young children, and also with people living with dementia.

A critical examination of existing Sensory Rooms in 16 care-homes in London and South England area during the early stage of the research revealed the impact of poor design in the form of aesthetically and functionally inappropriate installations and accessories. It also uncovered that there was a lack of knowledge and guidance for care practitioners how to facilitate sensory activities and environments for older people with dementia.

The analysis of the results led to identifying essential criteria to be considered during the design of environments that successfully respond to the specific sensory needs of individuals with dementia, subsequently increasing the benefits for users and supporting carers and care-givers. The research established that the environment needs to

- — make users feel comfortable and safe as this helps to reduce stress and anxiety, to relax and better focus on activities offered.
- — offer familiar, personal and meaningful experiences relevant to the individual's life and stage of dementia.
- — offer multisensory encounters responding to individual preferences, needs and abilities.
- — support a range of sensory experiences that can be either stimulating or relaxing in their effects.
- — allow and encourage autonomy for the user so they can control and interact at their own pace.
- — be usable and appropriate for adults, particularly regarding the aesthetics.
- — be flexible and adaptable to provide opportunities for a range of activities, and be cost-effective in implementation to overcome economic barriers.

These initial design guidelines were published as an online resource entitled "How to make Sensory Room for people living with dementia" (Jakob & Collier, 2014). As a tool, this user-friendly guide book aims to equip carers and staff in care-homes with ideas and information on how to set-up sensory enriched spaces that meet the specific needs and preferences of people living with dementia, their families and the care-homes they live in.

3. Co-creating a sensory experience at Coombe Hill Manor

As a result of the published guide, the research team was approached by staff from Coombe Hill Manor care-home[2] in Kingston upon Thames, South London. Keen to constantly improve their service, the care-home was seeking advice on transforming an under-used lounge within their dementia suite into a sensory-enhanced space to be used for multisensory activities for residents living with dementia (Figure 1).

This initial contact evolved into a collaboration where care-home staff and researchers worked closely together creating a solution that would work best for the home and its residents. Although co-design was encouraged as much as possible during the development phase, residents were not involved due to severe cognitive impairment and very limited verbal communication. Utilising methods of eliciting information in a non-verbal way would have required extensive preparation which was not viable due to limited budget and time resources.

[2] Coombe Hill Manor, which opened in 2014, is run by private care provider SIGNATURE SENIOR LIFESTYLE ltd - a group of purpose-built care-homes aiming to offer person-centred support and high-standard care (signature- care-homes.co.uk).

The project received no external funding. An engagement agreement between the partners (Coombe Hill Manor care-home and the research institutions Kingston University and University of Southampton) established a budget of approximately £2000 for materials, equipment and costs incurred during the installation, provided by the care-home (with £1000 being donated by the families of residents). It was further arranged that the researchers' contribution and service would be in kind in return for continued access to the facility for further research including evaluation sessions with users.

Figure 1 Under-used lounge at Coombe Hill Manor's dementia suite (Photos Anke Jakob)

3.1 Sensory workshop and design participation

In line with the collaborative approach, the project started with a participatory

workshop (Buur & Matthews, 2008; Sanders & Stappers, 2008) with care-home staff and relatives of residents (Figure 2), which was structured in two parts. First, participants were given the opportunity to learn about and engage in multisensory experiences and activities that stimulating the senses through seeing, touching, hearing, smelling, tasting, and moving. The second part focused on co-designing a space dedicated to sensory activities. During this creative session participants were invited to consider what items and equipment would be most beneficial for sensory activities with their residents and should be included.

Figure 2 Participatory workshop at Coombe Hill Manor care-home with staff and relatives of residents introducing sensory experiences and encouraging participants to write/draw/talk about their ideas and wishes for a sensory space for their residents. (Photos Anke Jakob)

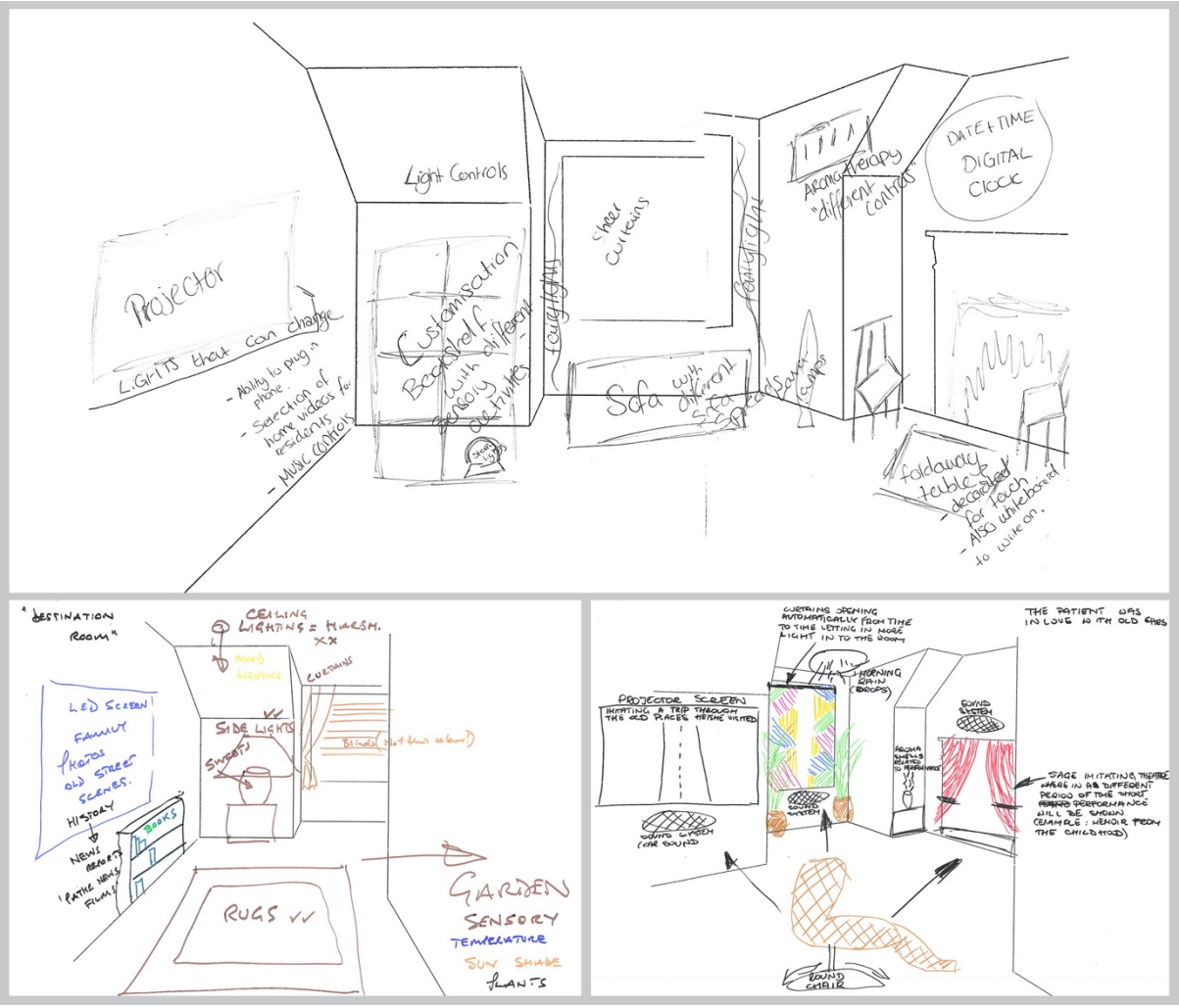
For eliciting information, the researchers provided a simple schematic drawing of the room, printed on A3 paper, to be used as a template where emerging ideas could be recorded in writing and through drawings (Figure 3). Participants were encouraged to present and share their ideas within the group which sparked lively discussions enjoyed by all. The workshop was appreciated as a platform for exchanging

knowledge and sharing experiences, providing carers and care-givers the opportunity to voice views and opinions. The presentations and discussions were video and audio-recorded, then transcribed.

Figure 3 Examples of the template, a schematic representation of the room, with drawings and text by the participants showing their ideas.

Although sensory stimulation, as a factor contributing towards the wellbeing of people living with the dementia, was a new topic to most of the participants the benefits and value of sensory engagement were well understood. The sensory room was seen as an opportunity for family members to spend quality time with their loved ones. Members of staff appeared keen to engage in the design and development of the room, seeing it as an active space within the daily life in the care-home.

The workshop delivered a breadth of information. Comments focused on function, experience, and location of interventions within the room. After a thematic analysis, following themes emerged: *lighting, appropriate seating, flexibility, audio-visual media technology, home-like atmosphere, 'bringing outside in', touch*.



Lighting: Interesting lighting, lights that catch the eye through visual effects such as changing colour or LED nets, emerged as a key theme. Also, as the existing room was rather dark, it was noted that lighting needed to be more effective to achieve better, more even illumination.

Appropriate seating: Participants expressed the need for furniture design and lay out that facilitated conversation and personal interaction, e.g. seating arrangements that enabled people to face each other rather than having to turn. Dissatisfaction was voiced with the existing sofas in the home which were too low and deep, making it harder or impossible to stand up without support. Staff emphasised that seating needed to be comfortable and safe.

Flexibility: In direct response to earlier comments, staff discussed that the space should offer flexibility in catering for different sensory preferences and tolerance of individual users. Therefore, the space needed to allow for quick and easy transformation from a stimulating room to a more tranquil setting, e.g. providing a place to store away sensory items, objects or equipment not always needed. Also addressed was the possibility to adapt the space according to seasons or themes, e.g. a walk in the woods.

Audio-visual media technology: Screens and projectors in combination with sound-systems, were seen as a good way to create multisensory, immersive experiences, and allowing a range of activities such as reminiscence or relaxation. Display technology was also viewed as a way to help connect with relatives further away by screening photographs or having live on-screen conversations.

Home-like atmosphere: There was a shared feeling that the room should feel like a familiar and natural domestic space. The sense of family, home and belonging was a leading theme amongst the group. It was suggested to keep the digital fireplace to support this notion.

‘Bringing outside in’: The inclusion of plants or water features was suggested to bring the outside in by referencing nature. Suggestions further included a fish tank, artificial birds (audio-featuring birds’ song) and butterflies, displaying stars and moon on the ceiling, and projecting the outside sky.

Touch: The inclusion of things to touch was a key aspect - tactile elements for playing and fiddling such as sensory muffs, sheep skin, baskets with sensory items, textiles, clothing, etc. Soft and fluffy textiles for furniture were preferred over leather which was perceived as cold and sticky. Sheer curtains could be combined with LED nets.

3.2 Design proposal and feedback

Based on the design guidelines, the insights from the workshop and the site-specific conditions, an initial design was developed addressing key aspects of lighting, furniture, technology, and material. These first ideas where presented as hand sketches and discussed with the care-home’s activity team and management. A final

design was agreed and the implementation planned in close collaboration with the dementia activity team. The scheme for the new space included:

lighting

- — indirect and soft lighting using white wall-washers and coloured LED strips along walls and window
- — selected colour-changing lights for visual focus: floor lamp, fibre optic strands
- — projection showing a range of various imagery
- — virtual fire place emitting warm, orange light
- — day light management using block-out blinds

furniture

- — safe and comfortable ergonomic seating suitable for older people
- — single armchairs instead of a two-seater allowing people to face each

other during conversation

- — flexible seating opportunities for accompanying person (staff or family),

e.g. puffs or stools

- — rocking chair
- — spacious and flexible room set-up to allow wheel chair access and to

cater for individual preferences

- — hidden storage keeping the room clutter-free

technology

- — wireless data projector connecting to tablet and telephone for video streaming
- — immersive sound-system
- — colour changing, programmable lights – to be set according to individual

preferences

- — mixing new technology with familiar aesthetic: e.g. colour-changing floor

lamp resembles living-room light through the use of textiles

- — aroma diffuser
- — star projector

material

- — textile curtains promoting a soft, calm and intimate atmosphere
- — soft cushions and blankets of various textures, sheep skin etc.
- — personalised sensory boxes

- — light, neutral colours for furnishing, walls and curtains creating a calm backdrop avoiding over-stimulation
- — colourful accessories for visual focus

An evening for family and relatives hosted by Coombe Hill Manor's dementia team presented an opportunity for collecting feedback. Information of the design process and results was provided via CGI images, photos and text. The discussion was audio-recorded with attendees' consent, and a feedback form completed to reflect like / dislike responses to the proposed design and any further recommendations.

Comments appreciated the amount of thought, attention to detail and care that had gone into designing the space with the residents in mind, and succeeding in creating a customisable sensory experience for each resident. Those family members who had taken part in the co-design process were pleased to see their contribution reflected in the final design.

Comments included:

- — "sensible use of a room which appears under-used otherwise"
- — "exciting, new and more personal space for the resident"
- — "calm environment with opportunities to adjust sensory experience for individuals"
- — "very good for different types of dementia, very person-centred"
- — "projector is a good idea, Skype is a good possibility"

Staff and family members indicated interest in contributing further to the development of the sensory room. For instance, family members offered to collect sensory items for their loved ones to go into their individual sensory boxes. Such items would support spending quality time in the room together, focusing on activities that are meaningful to the residents and their visitors, e.g. listening to favourite music, doing manicure, watching family photos and videos.

3.3 Implementation process and challenges

The process of implementation presented a number of challenges, such as the aspect of time needed to realise the project. It emerged that is was difficult to keep in time with planned schedules due to reasons including the lack of prior experience of installing a sensory space, limited financial budget, limited in-house resources and technical support, and time constraints of team members. Therefore, the team adapted an open-minded approach regarding the progress of the project taking the time needed for each stage of implementation to achieve the desired result.

Due to limited budget and in-house resources, voluntary and generous in-kind contribution from a number of individuals proved essential - not only regarding financial support but also collaborative effort and expert input. This included room re-

decoration undertaken by friends and relatives of staff, and electrical and light installation undertaken by locally based electricians.

Aiming for cost-effectiveness, two of the armchairs already available in the home were re-appropriated. These chairs were comfortable and specifically designed with older users in mind, offering correct seat height and wide armrests, and with low backrest visually non-intrusive to the space. However, the upholstery fabric featured a very distinctive and striking pattern unsuitable for the purpose. Therefore, removable covers made from plain, neutral-coloured textile were fabricated by one of

the researchers. In hindsight, the rather time-intensive production of these covers should have been outsourced in order to feasibly balance invested time and finances.

With the help of the in-house technician, works such as fitting the blinds and curtain rails were completed and, step by step, furniture, lights and technology including the colour-changing floor lamp, a rocking chair (second-hand purchased nursing chair), cupboards for storage, a projector, curtains, fibre optic strands, a star projector, a sound bar and an aroma diffuser were added to the room. Finally, the space was enhanced with accessories such as colourful, textured cushions, dry twigs and a glass bowl containing sand, stones and shells referencing familiar domestic environments and nature (Figures 4 and 5).

Figure 4 Finished sensory space in different lighting situations. (Photos Anke Jakob)

With the installation of this new facility, a new destination for the residents on the dementia suite, a tranquil and attractive place, a space of a new sensory quality, has been created. The flexible set-up offers the opportunity for different sensory scenarios and atmospheres by combining choices of lighting and equipment, whereby not all of them should be used at the same time. Multisensory objects and elements such as scented fans, instruments and sound makers, sensory snacks support multisensory activities with residents. A collection of sensory items stored in individual boxes for each resident helps to personalise the experience.

Workshop-style training sessions aim to enable care staff to understand the possible variations on expression and atmosphere and to provide personalised experiences for the people they care for.

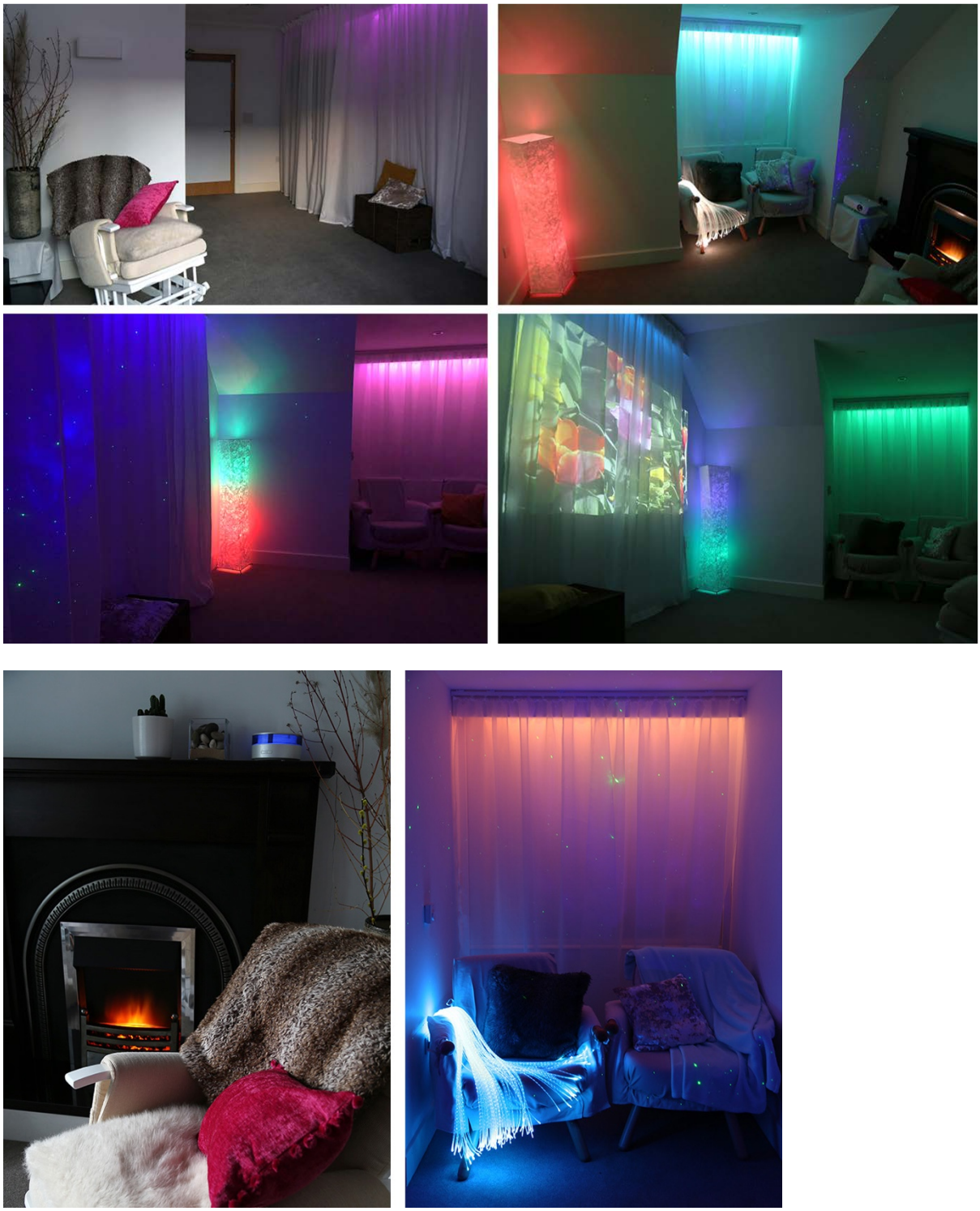


Figure 5 Seating opportunities referencing home-like atmosphere (left) and featuring fibre optics strands and cushions of varying textures (right). (Photos Anke Jakob)

3.4 Initial response from residents and staff

As the room was completed only recently, the research team has not undertaken

systematic evaluations yet. However, staff have begun to guide residents into the room. Initial response, including commentary from the users themselves, indicates that the new facility is enjoyed by residents, as described in the following.

The coloured lighting along the wall had a powerful transforming effect on the space creating a soothing and engaging atmosphere.

“It can be quite noisy at times, then it is nice to come in here and feel peaceful and calm.” (Ruth, resident)

Using the projector, the space has been visited frequently by a number of residents enjoying projected sceneries such as seaside, flowers, music concerts and comedy. The opportunity to watch videos and listen to music undisturbed has changed the life of one residents in particular:

“I do so enjoy visiting my special room. I can watch my jazz concerts very loud which I have never been allowed to before! I love the atmosphere, it helps me to escape and enjoy my music.” (Peter, resident)

Feedback from staff has been positive. The room being a unique, quiet and tranquil place was highlighted as an important feature to escape the sometimes busy shared living areas in the care-home:

“I like the fact that that there is an extension where it is a different and a completely calmer atmosphere for our residents.” (Dania, care team)

“Our residents have a space where they can have the confidence to relax and enjoy the moment of calm.” (Lisa, activity team)

Feedback also included comments regarding positive impact on staff moral and motivation:

“Witnessing the magical moments that the sensory room brings to my residents fills me with further inspiration to explore and deliver every unique experience possible to each person. The possibilities are endless.” (Debbie, activity team)

4. Conclusion and further work

This work-in-progress project has already generated benefits and value on many levels. Promoting knowledge exchange, it has contributed to the learning of all involved - designers and healthcare professionals, researchers and practitioners.

For care providers and care practitioners, the outcomes supply valuable information regarding feasibility, costs, time-scale and workload – serving as a guide for others intending to set up similar facilities. The project provides a showcase how an inclusive and compassionate approach involving as many stakeholders, volunteers and beneficiaries as possible can lead to cost-effective and successful solutions.

For the researchers in particular, it has been an invaluable theory-into-practice exercise. Being a design pilot, the challenges and issues of practical nature provided a great learning curve through making and doing. As the project did not receive any external funding, the limited budget constituted a challenging issue forcing the research team to face unexpected situations and explore alternative solutions to reach cost-effectiveness.

Furthermore, this has been an excellent opportunity for implementing a design concept in a real-life setting. The room will serve as a prototype, offering the chance for assessment of outcomes and advance ongoing research. It will allow the research team to perform design evaluation and user-feedback sessions generating evidence on the value of design in supporting healthcare practice.

A thorough evaluation of the impact on the daily life and wellbeing of the residents and their carers will include:

1. conversationsabouttheexperienceofthespacewithresidentswith dementia, and a carer familiar with the individual with dementia in cases of limited verbal communication; observing residents using the space.
2. systematicallycollectingfeedbackfromstaffandvisitingrelatives regarding a) the use of the new space by residents, b) perceived benefits for the people with dementia as well as for staff and visiting relatives, c) whether it had influenced care methods and views amongst care professionals.

The results of the evaluation will highlight successful features and identify challenges, as well as help to critically assess the design guidelines published previously indicating amendments and/or additions to be considered.

The authors anticipate that this research will raise awareness amongst carers and healthcare professionals regarding the significance of adequate multisensory

experiences for people with dementia. Supplying carers with the necessary tools to support their daily tasks will advance dementia care methods, environments and activities. Furthermore, the authors make a case for sensory design training and education to be offered to carers, with a view to empowering them to adopt a ‘designing attitude’ in their care practice and mobilise their own creativity in developing a sensibility for appropriate and cost-effective design solutions. This in turn will result in them adequately supporting people living with dementia -thereby improving overall wellbeing for both residents and carers.

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