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## **An educational interior design framework for promoting greater inclusivity of the aged living in multigenerational households**

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### **Abstract**

*Multigenerational households are inhabited by three or more generations cohabiting; however, homes are not always designed to accommodate multiple generations. Having been raised within a home filled with grandparents, aunts, uncles, cousins, parents and siblings, the personal experience of the primary researcher has been drawn on to frame the analysis of the challenges associated with multigenerational living. Multigenerational living requires functional spaces: space that efficiently includes all occupants to create a harmonious environment. As a prematurely ageing person with many physical challenges associated with degenerative spinal changes, the need for these spaces to be flexible and adaptable to changes related to physical and psychological development through age has been personally recognised. The understanding of the diverse physical and psychological needs of the users of the space features highly as a means of addressing how multigenerational spaces are designed. The paper follows both theoretical and functional standpoints. It draws on the social inclusion theory and empathic models to achieve a more in-depth understanding of people's motivations and spatial intentions. This understanding is then translated into a photorealistic interpretation via 3D renders to facilitate design decisions prior to finalisation of spatial plans and purchases. It highlights the use of the interior design 3D rendering process to extend existing interior design tools such as 2D sketching and physical samples. The 3D experience of spaces, as facilitated through technology, aligns with the characteristics of the fourth industrial revolution, where the merging of physical, digital and biological worlds is prioritised. Focusing on the potential interaction between generations, both as positive and negative experiences, this paper further aims to promote barrier-free living, self-care and aged care through design improvements and considerations. It takes the broad theoretical understanding gained from data collection methods, literary reviews, ethnographic and autoethnographic experience and serves as an educational function for both student, professional, and user usage when designing multigenerational households. The structure of the interior design guidelines for multigenerational living prioritises design for barrier-free living and self-care, with adjustment potential for changes associated with ageing by following an empathic educational model specifically designed for multigenerational households. This model provides an educational framework in the hope to alleviate anticipated tensions experienced in multigenerational households through interior design.*

**Keywords:** Ageing population, inclusivity, interior design, multigenerational, social inclusion theory

## Introduction

Aged living arrangements differ and are not always determined through choice but also through consequence. Whether through choice or consequence, multigenerational living is a reality in Africa. Based on statistics provided by Statistics South Africa (StatsSA, 2017), there has been a tendency for the aged to rely on family support. The move from a nuclear household that comprises a husband, wife, and children can move towards a single person living or multigenerational living as the need arises. The effects of COVID-19 show an increase in multigenerational living. Designers must design with the notion that we are designing our future selves as an empathic gesture. We are going to get old – this is one of our few certainties in life. “The grey burden” is the term used to describe the aging population (Harper, 2013). It is a term that could be received negatively depending on the personal perspective of the receiver.

As a design-focused study, the environments in which the aged live, and how and with what the aged interact within the environment, are prioritised. The research aimed to identify and highlight the value of interior design tools as providing an educational framework for both designers and users and also to consider how this framework may alleviate foreseeable tensions experienced in multigenerational households.

### *Multigenerational households defined*

Multigenerational households are households that have more than one or two generations living under one roof. In the later years, a home is where most adults are destined to spend most of their time (Harper, 2013). It is in the best interest of the aging population of Africa to begin thinking of their future living environments in advance. Multigenerational living is one of the cohabiting options available to the aged.

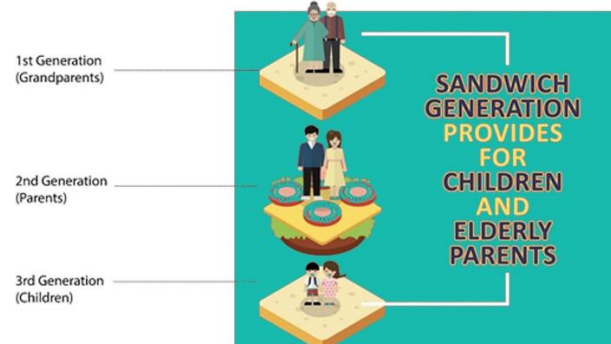


Figure 1: Structure within multigenerational households

Within this study, multigenerational households have been categorised as including grandparents (identified as first generation), parents (identified as second generation), also referred to as the 'sandwich generation, and children (referred to as the third generation) (Louw & Louw, 2019). It is understood that a grandparent could be as young as 40 or as old as 90. However, for ease of understanding, chronological ageing will be used.

Dependency tends to increase with age (Baltes, 1989). Physical and psychological decline increases reliance on others for the ageing population. As the ageing population become more dependent on the other generations within the household, there is a tendency for their 'voice' within the household to be relegated. It is the professional responsibility of designers to foresee these changes and provide sensible solutions to benefit all generations of the home.

### *Benefits of living in multigenerational households*

Multigenerational living is challenging, but studies reveal the benefits outweigh the challenge (Williams, 2016). Some of the benefits are as follows:

#### *Economic benefit*

- Unemployment – 37.2% of the multigenerational households comprise the unemployed (Williams, 2016);
- Affordability – Students are staying longer at home for the financial benefit; and
- Shared resources – Sharing of food, rent, and utilities provide financial relief (Muenniga, et al., 2018).

#### *Social benefit*

- Companionship – the aging population have the benefit of having people around them;
- Intergeneration parenting – the second generation are aided with parental duties, for an example, fetching the children, homework, and general care taking (Louw & Louw, 2019); and
- Assisted living – the provisions of assistance during times of need.

#### *Psychological benefit*

- Security – Living alone provides a sense of security to all three generations.

### *Aims and objectives of research*

The research undertaken identified gaps in theory and research concerning barrier-free living associated with self-care and aged-care. It used qualitative methods such as interviews and questionnaires, ethnographic and autoethnographic research. The aim was to explore the challenges of the aged populations living in multigenerational households and propose ways to improve the quality of living for all generations through design improvements and considerations through the creation of a harmonious environment. The research, therefore, had an educational function for design students and professionals whose interests were directed towards multigenerational living. The objective was to produce an interior design guide for designing multigenerational households through theoretical methodologies, and data collection sampling.

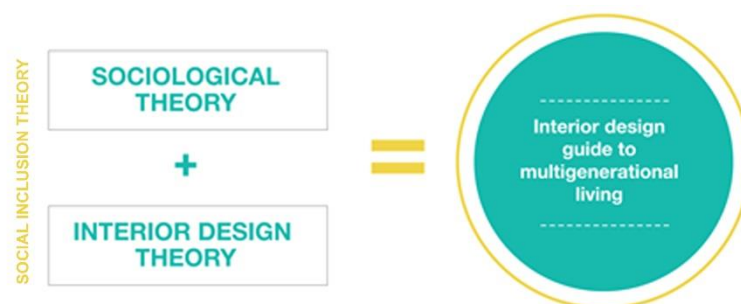


Figure 2: Approach from theory to outcome

### **Approach of study**

A user-centred design approach was adopted, and qualitative methods used to collect data. A theoretical framework was developed in response to desktop research. Interviews and questionnaires were administered to first generation and second generation users of

multigenerational living spaces. Medical professionals outside of the design field were also interviewed to draw on expertise regarding the experience of the aging populations. This data, coupled with ethnographic and autoethnographic knowledge, was used to formulate design guidelines to assist with designing multigenerational living spaces.

## Limitations of study

This study intended to show merit for further exploration and investigation, as time constraints and low sample size. The practical validation of theories highlighted showed immediate results and, therefore, are intended to remain hypothetical and within the constraints of educational theory until the processes has been tried and tested. The proposed guidelines are flexible and customisable to the challenging circumstances for the household being designed.

The data collection method of interviews and surveys were intended as a self-reporting method which may be subject to participant bias. The proposed sample size further showed an underrepresentation of male participants.

## Sample size of data collected

The following samples were drawn on for each data collection method:

1. Survey from first generation participants: 3
2. Interviews from first generation participants: 1
3. Survey from second generation participants: 6
4. Interviews from second generation participants: 1
5. Interviews with professionals
6. 1 x occupational therapist
7. 1 x professional caregiver in an aged care facility and nurse at a hospital in Pretoria.
8. Ethnographic and autoethnographic research of researcher.



Figure 3: Researchers experience in multigenerational households.

Based on the years of experience within multigenerational households, the reflective journey of the researcher served as an integral part of the data collection method.

## Research methodology adopted within the study

For the researcher to conduct research using observations, perceptions and experiences, the interpretivist paradigm was used to conduct the study. The interpretivist paradigm allows for the collection of various and personal perspectives and a final interpretation of these perspectives by the researcher (Williams & Babbie, 2006).

## Overview of research conducted

The study followed both theoretical and functional perspectives on ageing. Within the theoretical perspective, a theory was sought to help navigate the learning process within strict control measures in order to ensure authenticity. Ethnographic and autoethnographic research was a fundamental aspect of the study but had a risk of selective observation, illogical reasoning, and inaccurate observations (Williams & Babbie, 2006). Social inclusion theory was the moral and ethical compass identified and used.

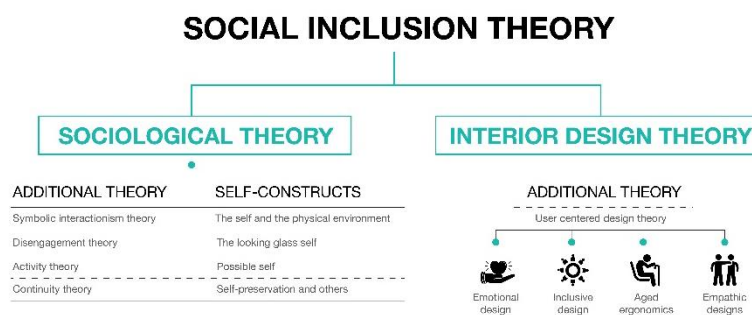


Figure 4: Breakdown of social inclusion theory

## Sociological research

An understanding of sociological research played an essential role in the literature review. Before reviewing existing literature, the researcher needed to recognise the pitfalls associated with sociological research.

Science is not expected to centre on moral and value issues. It is based on facts and data. Sociology helps us understand what we observe in a scientific manner. Only after this understanding is achieved can we then use this understanding to formulate a solution (Williams & Babbie, 2006).

Selective observation, illogical reasoning, and inaccurate observations must be avoided during the data collection process (Williams & Babbie, 2006). 'Snapshot' views have been discouraged: this refers to once-off observations of users within multigenerational households.

Overgeneralisation and the assumption that personal experience is the same for all was a pitfall that the researcher had to be cautious of. The researcher had to be mindful of qualifying all observations to find patterns in behaviours of users within multigenerational living spaces and the challenges faced within the environment. As such, a strong theoretical foundation was developed to counter these two potential limitations, and the literature review provided the means through which this was achieved. Identifying challenges is the basis for finding solutions.

## Social inclusion theory

This study is contextualised within the social inclusion theory, which refers to interior design and sociological contexts. According to *The Practice of Social Research* by Earl Babbie, social science combines logic and observation (Williams & Babbie, 2006).

Dan Allman expanded on the theory of social exclusion by David Pocock (1957) to include social inclusion from a sociological perspective. How people function within a society, and the need for inclusivity to benefit psychological satisfaction (Allman, 2013).

Social inclusion theory serves as a rational motivator towards creating a functional multigenerational living environment. Both theoretical and functional perspectives have been drawn on to formulate an educational framework for multidimensional living spaces.

## Theoretical perspective on ageing – sociological theory

**Objective 1: -**

To explore literature and conduct field research to better understand the challenges faced by the aged population in South Africa.

Challenges experienced by the ageing populations are encapsulated within sociological theories and create a foundation for further exploration. The following approaches have been selected based on their expected contribution to the study. Each theory has also been equated with a self-construct related to the user-centred focus of the approach taken.

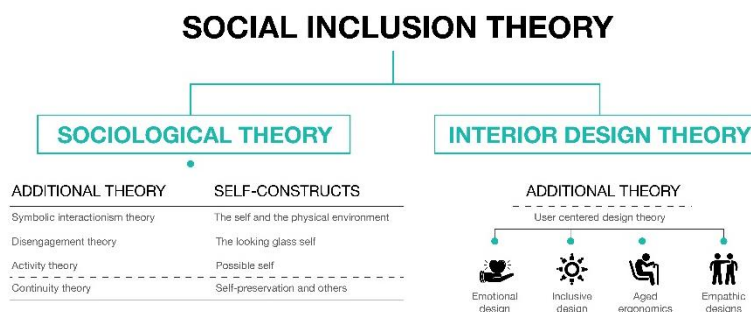


Figure 5: Breakdown of social inclusion theory

**Symbolic interactionism theory**

**Self-construct: The self and the physical environments**

The application of symbolic interactionism within this study provides insight into how people interact within the symbolic environment. The primary symbol is the home, and secondary symbols are the objects within the home. The user's interaction with the space in which they inhabit is essential in the design decisions of the space (Blumer, 2013).

As a designer, empowering people to take care of themselves and having environments that promote a self-care environment moves reliance from object-focused to people-focused. It reduces the risk of being a "grey burden" and the feeling of having to deal with the "grey burden" (Harper, 2013).

#### Disengagement theory

Self-construct: 'Looking glass self'.

Disengagement theory refers to the notion that it is expected for the ageing population to distance themselves as they reach the sunset years of their life (Coleman, 2008). It is the way the aged perceive themselves as they grow older. This suggests that the ageing population expect to be excluded. This expectation within a multigenerational living household may have negative connotations to the harmony within the home. A household that suits the needs of the ageing population will provide a contradiction to this theory. Even though the aged expect exclusion, the physical environment shows inclusion (Coleman, 2008).

#### Activity Theory

Self-construct: Possible selves

Activity theory, coined by Robert J. Havighurst, was a theory that responded to the disengagement theory. The importance of staying active in ageing and maintaining a strong social network contributes to a healthier and happier ageing life (Louw & Louw, 2019).

Activity theory feeds strongly into the self-construct of the possible self—the way a person wishes to be when they are older.

Ageing comes with the loss of family and friends. Deteriorating health issues also challenge social interaction. Economic challenges may also surface during this later stage of life. Promoting social engagement with interior design choices within multigenerational households will benefit the well-being of the ageing populations.

#### Continuity theory

Self-construct: Self-preservation and others

Continuity theory refers to maintaining lifestyles that the aged were accustomed to (Louw & Louw, 2019). This continuity addresses the importance of preserving the lifestyle but is criticised for not providing how this would be done. Within this study, continuity could be encouraged through the implementation of interior design theory. An environment that is adaptable to suit changes in mobility and spatial needs will promote continuity. A flexible custom fit environment will feed into the self-construct of self-preservation and others. Self-preservation will ensure that the aged maintain independence and are free of reliance on others.

## Functional perspectives on ageing – Interior design theory

#### Objective 2:

To explore and conduct field research to provide guidelines on adapting multigenerational households in South Africa.

Interior design theory was selected to maximise design outcomes for the benefit of the ageing population. Literature on the user-centred design provided an extension to the views absorbed from the case studies via surveys and interviews. International gerontologist and

industrial designer Patricia Moore's empathic model, the teachings of Donald A. Norman and the identifiable tension points and solutions exposed using the teachings of VUCA/VUCA 2.0 has been leaned upon.

## Empathic model

### *User-centred design theory*

User-centred designs place the users at the centre of the entire design process. The users are involved in design decisions and solutions (Norman, 2013).

User-centred design informed the process followed in addressing the problem on both a practical and theoretical level. The best way to explain user-centred strategy regarding the aged population is to look at it from the point of view of one of the people who was instrumental in coining the term. Donald A. Norman is an American writer, professor and director of The Design Lab in the University of California, San Diego. The now octogenarian is most known for his book, *The Design of Everyday Things*: a book regularly consulted by psychologists and designers at large (Norman, 2019).

In one of Norman's most recent online articles in *Fast Company*, he expresses his dissatisfaction with the designs created for the older generation. He passionately spoke about his active self that is also getting a little slower and a little weaker as he gets older. He speaks of how the older customers are an untapped market. Individuals that are willing and able to spend to make their quality of lives easier (Norman, 2019). He coined the term 'Crystallised intelligence', and defines this as intelligence that comes with age and experience (Norman, 2019).

Designs for the aged should be functional, aesthetically pleasing, and stylish. He promotes 'inclusive design', designs that takes everyone into account, as opposed to designs that stand out and point out incapacibilities. If designed correctly, designs that are designed for the aged should be beneficial to people of all ages (Norman, 2019).

User-centred design, particularly in the ageing population, is as relative as age itself. The way a person handles ageing, and the concerns that come with it, is also relative (Louw & Louw, 2019). Progressive designing that can be adapted according to the bespoke needs of the aged is essential.

User-centred design has been described as design philosophy that begins with a solid understanding of the user and the user's expectations. The users' experience with the design is the decider of the good or bad design (Norman, 2013).

Design is not only about solving a problem; it should not start with trying to solve a problem but rather finding the core issue (Norman, 2013). For example, if an aged person complains that their legs are painful walking up the stairs, adding a rail may not solve the problem. It may be a medical condition that requires medical assistance.

A rail or a stairlift may assist in providing mobility, but the designer needs to understand the user's expectations. By adding a stairlift or a railing, does the user expect to have no pain at all or merely to enjoy the view from the top floor?



## Emotional design

The human factor in multigenerational living is fundamental in creating a harmonious environment. Norman (2013) states:

*Emotions are inseparable from and a necessary part of cognition.*

Norman – a researcher, writer, and designer – professed that emotion and design could not be separated. Feelings are connected to designing (Norman, 2013).

The social self-constructs and emotional designing provide an understanding of user behaviour of the ageing population. Therefore, this study intended to encourage a sense of the self and confidence in the connection to the self, leading to empathy for others.

## Inclusive design

Multigenerational living needs to cater for the needs of all the users of the household.

## Aged ergonomics

Ergonomics refers to the design of spatial environments and products concerning the intended use to ensure efficiency and safety. (Merriam-Webster, n.d.) For example, the dimensions of the human fingers when designing a glove. The following are recommendations made by experts in the care of the elderly:

- Ergonomics for the aged must be tailored to suit the individual. There are not many instances of spaces and products that have “one size fits all” solutions;
- Ergonomic seating ensures both comforts and allows for inclusions within households. Sofas and chairs with high backs, lumbar support, and comfortable cushioning that is firm and encourages correct posture are advisable. Low seating and chair that do not have armrests should be avoided;
- Accessibility is key. Placing needs and wants within proximity of the aged will provide added comfort and reduce mobility challenges. Objects placed in places that require the aged to bend down or stretch should be avoided;
- The capabilities of the aged should be considered when purchasing products. Items that require added strength must be avoided due to the medical challenges faced by the aged; and
- It is modifying existing furniture and objects to adapt to growing needs instead of bespoke items, usually at a higher cost (Meigs, 2018).

## Empathic design

Empathic design refers to understanding the user's emotions and subjective experiences (Gibbons, 2018). The empathic design relies on the ability to analyse the user using signifiers. Signifiers refer to signposts that exist beneath what is just said and is specifically related to semiotics, as proposed by Ferdinand de Saussure. The researcher is required to look at significant words that provide a greater understanding of the needs and wants of the user (Batagoda, 2017).

Empathic designing within the ageing population context is crucial in understanding the user and their needs. Design empathy is a design tool necessary in conducting both ethnographic and autoethnographic research. It extends the designer's obligation to include design decisions that promote empathy between the different generations.

## Multigenerational challenges as identified from data collection

Common threads, pain points and anchor points – as identified from surveys, interviews, ethnographic and autoethnographic data – are as follows:

- Economic factors left little or no room for interior design as such;
- The bedroom under the staircase left no room for privacy even though it was closer to the bathroom;
- Stricter care of medication and meal provisions;
- Grab handles are rejected due to them being portrayed only for the aged, universally designed features may be more acceptable;
- Necessary essentials like umbrellas, garden wear, hats, and jackets should be easily accessible;
- Night visibility should be increased;
- Climbing up and downstairs;
- Inserting and removing meals from the oven;
- Hanging out washing;
- Inserting and drawing meals from the oven;
- Difficulty in removing laundry from washer;
- Exhaustion after bathing;
- Bending to pick up items;
- Not finding items when needed; and
- Personal grooming due to ailments.

## VUCA/VUCA 2.0

VUCA aligns strongly to social inclusion theory and neatly organises the tensions with possible solutions, according to Bill George from Harvard Business School's response with VUCA 2.0.

The tensions in multigenerational households, according to Caredda (2020), are as follows:

- Volatility
- Uncertainty
- Complexity
- Ambiguity.

As the family dynamics change and evolves, so does the role-play between the different generations. These role changes could easily result in a volatile environment should the role be reversed due to consequences beyond one's control like unemployment or ill-health. It could result in uncertainty over duties and expectations. One of the first generational participants mentioned how tension set in once the two younger children could no longer share a room. The first generational participant felt conflicted, happy to have the companionship, while disappointed at the loss of privacy.

In response to VUCA, VUCA 2.0 was positioned by Bill George, Harvard Business School (Caredda, 2020), as encapsulating:

- Vision
- Understanding
- Courage
- Adaptability.

Technology has, therefore, recently played a vital role in reducing predictable tensions in home renovations. Envisioning a design outcome using technological resources proves beneficial in simulating design ideas through photorealistic 3D renderings. 3D renderings can showcase ideas and get approval from the various members of the household before incurring any costs. These visuals remove the risk of assumptions and provide visual reference points for design concepts. It allows the various generations to make risky suggestions, with the comfort of knowing that finalising decisions is limited to paperwork and not subject to significant cost implications. 3D renderings assist in adapting spaces in a digital format for approval before finalising decisions.

## Multidimensional solution for multigenerational living

The learning combination of the theoretical and functional perspectives positions a multidimensional solution as an educational framework for designing multigenerational living spaces. A multidimensional proposition involves understanding sociological aspects associated with multigenerational living, with physical needs of multiple generations sharing a single living environment.

Using the acronym MSML, this empathic model is being proposed as encompassing the following values:

### *User-centred design*

User-centred design, particularly in the ageing population, is as relative as age itself. Designs with multigenerational households must be customised according to the needs of that household.

If a designer's services have been engaged, there is usually a reason for this engagement. Indecisiveness, time constraints, economic limitations, pre-existing tensions could be reasons for consulting a professional. As a professional, understanding the designer's role and executing that role professionally is vital in creating a harmonious setting within a multidimensional household.

### *Inclusivity*

Due to the dynamics that exist between generations, using design solutions that promote inclusivity is necessary. For example, solutions could include a dining area that provides seating to meet the needs of all members of the household.

### *Usability*

The designer should propose design elements that are user friendly for all generations. For example, a mirror with a tilt function will serve someone in a wheelchair and someone attending to their grooming necessities.

### *Self-care*

Promoting self-care encourages independence and reduces tensions caused by dependence.

### *Empathy*

Design decisions that promote empathy between the different generations are vital. Finding a balance between shared and private living areas is one of the ways to encourage kindness. It is respecting the need for privacy without compromising on the need for inclusivity.

### *Predictability*

Designers need to predict foreseeable tension points among the generations.

### *Respect*

As mentioned earlier, living spaces are personal and require a personal approach. Maintaining professionalism as designers is key. Even though a personal approach is required, personal involvement in family affairs must be avoided and family boundaries respected.

### *Adaptability*

Designers should provide adaptable solutions for emotional, psychological, and physical growth: not just the changes expected within the ageing population, but also growth among all family members in general. Multigenerational households, therefore, become a multidimensional evolving design project.

Design solutions that promote self-care are imperative—self-care not only from the perspective of the aged but from all the generations. An organised environment with a place for everything will reduce tension points.

### *Compromise*

Designers should respectfully find compromises among family members: using technology not only to sell the concept but, more importantly, to realise the vision of all the users of the space. This may require many spatial rearrangements and material changes. Technology – that is, 3D renders – assist in finding that compromise before incurring costs of construction. The conversation of, for example, discarding an old piece of furniture may go easier if supported by a visual representation of what the space would look like with a mixture of the different styles of furniture.

### *Selling vision – not design*

Designers are selling a vision and not just selling designs. Multigenerational spaces are personal; therefore, tensions arise when members of the households handle the conceptualisation of these spaces by themselves. Design decisions go much smoother when facilitated by a professional. Using design tools, design professionals can encourage collaborative conversations that will showcase the needs and wants of the users of the space visually before finalising any design decisions.

Patricia Moore, a gerontologist and industrial designer, speaks of revisioning, advocates for seeing change as opportunities (Moore, 2015). Projecting proposed spatial changes visually

for the approval of all participants within the household reduces dynamic tensions usually associated with change.

## Conclusion

Social inclusion theory, VUCA/VUCA 2.0 and the empathic model have enacted theoretical and functional perspectives in designing multigenerational living spaces. The use of design tools, such as 3D renderings, facilitates design conversations between the various generations and formalises the design visions for the area before finalisation. The proposed empathic multidimensional solution for the multigenerational educational framework highlights key touchpoints for designers, design students, and users of multigenerational spaces to alleviate dynamic tensions often associated with multiple generations living under one roof. As design professionals, knowing that we are designing for our future selves serves as the motivator in designing respectfully and responsibly, guiding both designers and users through an educational framework that is multidimensional and adaptable.

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