RESTRICTING FACTORS IN THE SELECTION AND SPECIFICATION OF SUSTAINABLE MATERIALS: ANINTERIOR DESIGN PERSPECTIVE.

Emmerencia Petronella Marisca Deminey
University of Johannesburg, Auckland Park Bunting Road Campus, Johannesburg, Gauteng, South Africa.
University of Johannesburg edeminey@uj.ac.za
Amanda Breytenbach
University of Johannesburg, Auckland Park Bunting Road Campus, Johannesburg, Gauteng, South Africa.
University of Johannesburg abreytenbach@uj.ac.za

ABSTRACT

Internationally and in South Africa, interior designers are faced with the objective to reconsider and replace traditional surface materials with materials that meet sustainability criteria. The process contributes to many challenges that impact on the accurate selection and specification of appropriate sustainable materials during the design and implementation stages of a project. This paper aims to focus on the factors that restrict and limit designers to specify sustainable surface materials and therefore prevent them from converting their conventional design processes within a South African context. In order to identify the factors, a critical review of literature was conducted as well as interviews with practicing interior designers situated in Johannesburg. The literature review identified that the task of selecting and specifying sustainable materials is a prominent barrier which ultimately affects the implementation of sustainable practice. This task commences during the first stages of the design process and if it is associated with restriction or limitations, it could contribute to resistance toward adopting sustainable design practices. Feedback from interior designers shed light on the barriers applicable to a South African context and reveals the radical change that is needed to assist in addressing the lack of transforming the sustainable market and adoption of sustainable practices.

Key Words: Interior design, selection and specification, sustainable surface materials, restricting factors.

1. INTRODUCTION

Since1999, studies have been conducted to understand why interior designers are not implementing sustainable practice in their decision-making process. The studies conducted by Mariam Landman (1999, pp. 29-33), Alison Terry, Andrew Walker-Morison, Usha Iyer-Raniga and Margaret Bates (2007, p. 12), Kirsty Máté (2009, p. 2), Elif Sonmez & Filiz Tavsan (2018, p. 28) and Michelle Hankinson (2011, pp. 17, 30,80-94), provide a global insight of the factors that influence the implementation of sustainable interior design practice. These studies identify sustainable material selection and specification as one of the prominent barriers to the implementation of sustainable interior design practice due to various influential factors that have a hindering or limiting impact on the selection of sustainable materials.

During the design of a sustainable building the selection and specification of sustainable materials forms part of the first decisions taken in the initial stages of the design process (Akadiri, 2011, p. 7; Pearce & Venegas, 2002; Sonmez & Tavsan, 2018; Zhang, 2012, p. 5). The decisions taken during the initial stages of the sustainable design process, make an important contribution to the final sustainability outcomes of the building. For this reason, the selection and specification of sustainable material should be included in the decisions taken during the conceptual design stages (Akadiri, 2011, p. 7; Pearce & Venegas, 2002; Zhang, 2012, p. 5). The selection process should furthermore be addressed in a holistic manner, which takes into account the entire lifecycle of material and addressing the ecological, social and economic consequences affecting the outcome of the selection. Interior designers are well positioned to positively contribute to the implementation of sustainable building practices through holistic sustainable material selection due to their decision making roles in the initial stages of the design process. However, Mihyun Kang and Denise Guerin (2009, p. 179), Máté (2009, p. 1) and Eunsil Lee, April Allen and BoKyung Kim (2013, p. 1), explain that while interior designers can make conscious decisions about material selection and specification, their task of implementing sustainable practices is limited. The task of selection and specification of sustainable surface interior materials remains challenging due to the many restricting factors that hinder or limit the material selection process. Thus, this paper aims to focus on identifying the factors influencing sustainable material selection and specification that are specific to South African interior designers.

2. RETHINKING THE TRADITIONAL APPROACH TO SUSTAINABLE MATERIAL SELECTION

With the global mind shift advocating the need for holistic thinking and natural environmental preservation for future generations, the way in which all realms of the society operate has changed and the criteria for traditional material selection will no longer suffice. Kang and Guerin (2009, p. 179) argue that, traditionally, interior design decisions were dictated by the main influential factors which are: functionality, aesthetics, and costs. Although these remain influential in the material selection process, these criteria do not necessarily consider the life cycle of a material.

Interior designers are repeatedly tasked to select materials, which places the designers in a position of control over the choices made with regards to the selection and specification of sustainable materials. Rachael Brown and Lorraine Farrelly investigated the extensive use of surface materials by interior designers in order to reveal why and how materials are identified, selected and specified for interior environments. Brown and Farrelly (2012, p. 30) explain that "design is an act of will, a considered response to an identified need or desire, a process that often results in a… material solution".

However, the process of arriving at a final material solution is often a challenging task and remains a contentious issue (Calkins, 2009, p. iv; Trusty, 2003, p. 6). Brown and Farrelly (2012, p. 30) explain that it is challenging because there are many contributing factors that influence the material selection process. Kang and Guerin (2009, pp. 179-180) state that it is due to the fact that there is now another influential factor, sustainability, which lies beyond the border of the traditional interior design approach to material selection. With sustainability as an influential factor in the material selection process, it is more challenging as there are now more factors that have to be taken into consideration in the material selection process.

2.1. Influential factors hindering the selection of sustainable materials globally

Fatima Ghani (2012, p. 21) explains that the debate in understanding the ecological crises "still focusses on the symptoms rather than the causes". Focussing on Ghani's statement it is necessary to investigate what the influential factors are hindering the implementation of sustainable practices. Globally, influential factors have been identified that influence interior designers' decisions in the implementation of sustainable design practices and on the selection of sustainable materials. For a global perspective, we will reflect on the studies conducted by Landman (1999, pp. 29-33) in America, Terry et al. (2007, p. 12) in Australia, Máté (2009, p. 2) in Australia, Sonmez and Tavsan (2018, p. 28) in Turkey and Hankinson (2011, pp. 17,30,80-94) in KwaZulu-Natal, South Africa.

2.1.1. Barriers in America

In her study, Landman (1999, p. 30) identified the primary barriers hindering sustainable building practices prompted by a series of questionnaires directed to American building professionals. These barriers included 'clients not having an interest in sustainability', the building profession not thoroughly being 'educated in sustainable design', the 'high costs associated with sustainability' which is also related to 'availability of sustainable materials', and

'the long-term savings not being reflected in the service fee structure' (Landman, 1999, pp. 29-33).

2.1.2. Barriers in Australia

Máté's research conducted in 2006 (as cited in Máté, 2009, p. 2), identified both internal and external factors influencing interior designers' material selection which included the 'knowledge on sustainable design', the 'access to trustworthy information available about sustainable materials', the 'perception clients and designers have' about sustainable materials and lastly the interior designer's 'experience in the field of sustainable design'.

In 2007, Terry et al. (2007, p. 12) identified similar barriers that influence decisions regarding sustainable material selection. These factors included 'perceived relative cost'; the wide range of 'rating tools' available making the evaluation of materials even more difficult; 'inconsistencies in industry responses due to a lack of authorities governing sustainable development; 'slower building turnover' resulting in limited living examples; and lastly tenants, owners and building managers having "existing perceptions about acceptable churn rates" (Terry et al., 2007, p. 12).

Research conducted by Máté coincides with research done by Coleman (as cited in Máté, 2009, p. 2) in 2000 who surveyed 100 interior designers of the United States International Design Association. Coleman's research identified the designer having a lack of information, awareness and education on sustainable practices, the client who is not prioritising sustainability as design criterion, the client and or the designer having reservations about sustainable materials, and lastly the associated perceived cost of sustainable materials and systems, which directly impacts the decision making and implementation of sustainable practice. Máté (2009, p. 2) explains that these factors have a direct impact on decision making regarding sustainability. This indicates that external factors are continuously affecting the selection of sustainable materials for interiors.

2.1.3. Barriers in Turkey

In their research, Sonmez and Tavsan (2018, p. 28) approached 15 interior design firms to comment, in an interview process, on the factors that impact their material selection process. The research focusses on the responses of 12 design firms who identifies sustainability as a factor that influences materials selection. This indicates that sustainability is still not a necessity for all interior designers to consider during their material selection process.

2.1.4. Barriers in KwaZulu-Natal, South Africa

In her research, Hankinson studied the barriers impacting on the implementation of sustainable interior design practices. Hankinson (2011, pp. 80-94) identified three main barriers, including the 'cost of sustainable interior design', the 'education and experience of interior designers' in the field of sustainable interior design and lastly 'materials'. It is noteworthy that Hankinson indicates materials as a prominent barrier that must be overcome in order to implement sustainable interior design practices in South Africa.

Materials were identified as being a barrier because of the factors that influence the selection of sustainable materials and that ultimately affect the implementation of sustainable practices. Hankinson (2011, p. 90) pinpointed the influential factors as: 'supplier greenwashing', 'limited selection of sustainable materials available', 'products are imported', that it is 'costly to test products and set standards' and lastly the 'use of sustainable material as opposed to their traditional counterparts can prove to be an inconvenience'.

Although Hankinson (2011, p. 17) identified some factors influencing the selection of sustainable materials for South African interiors, she explains that her study is limited in explaining all the factors influencing sustainable material selection in South Africa because it is not the only barrier which was researched. Research is thus expanded to understand the factors influencing sustainable material selection for interiors.

2.2. Reasons for the existence of prominent barriers

A critical reflection of the selected literature reveals similar hindering and limiting barriers to selecting and specifying sustainable interior materials. These include:

- The cost associated with sustainable materials (Landman, 1999, pp. 29-33; Terry et al., 2007, p. 12)
- Greenwashing' from suppliers (Hankinson, 2011, p. 90; Máté, 2009, p. 2; Terry et al., 2007, p. 12)
- The interior designer's education and knowledge (Landman, 1999, pp. 29-33; Máté, 2009, p. 2; Terry et al., 2007, p. 12)
- Availability (Landman, 1999, pp. 29-33; Hankinson, 2011, p. 90)
- Lack of industry standards and guidelines (Terry et al., 2007, p. 12)

Further exploration into the prominent factors is required to gain an informed understanding of why these factors are hindering and limiting the implementation of sustainable materials and ultimately affect the implementation of sustainable design practices.

2.2.1. The cost associated with sustainable materials

The increased cost associated with sustainable materials is often only a misconceived perception (Milne, 2012; Spiegel & Meadows, 2006, p. 31) However, in some cases the initial cost of some sustainable materials is more than their traditional counterparts. Sustainable projects, suggested by Spiegel and Meadows (2006, p. 32) can cost five to 15 per cent more compared to projects without sustainability as a criterion. In 2012 this cost gap was further investigated by Milne, founding Chief Executive officer of the Green Building Council of South Africa (GBCSA). This report revealed that in the United States buildings with sustainability as criteria, cost between zero and four per cent more. The report also indicated that in Australia, buildings with sustainability as criterion ranged between being less expensive and up to six per cent more expensive compared to their traditional counterparts.

Spiegel and Meadows (2006, p. 31) suggest that the perception of sustainable materials costing more is difficult

to change. It is evident that the initial cost of some sustainable materials is more than their traditional counterparts due to new systems or alternative systems which can be more expensive to purchase as they are not commonly available and contractors are not yet familiar with installations. However, according to Penny Bonda, Katie Sosnowchik, & Summer Minchew (2012, p. 174), the initial cost is offset by the material's durability, reduced maintenance cost, and health benefits to occupants and their well-being.

2.2.2. 'Greenwashing' from suppliers

The increased interest in building sustainably flooded the market with manufacturers marketing their materials and products as 'green' in response to the demand. As a result, the term 'greenwashing' became synonymous with the 'green painted' market. The term emerged after the Earth Summit held in Rio de Janeiro in June 1992. The term greenwashing refers to the "superficial and unreliable dissemination of environmental hype" (Spiegel & Meadows, 2006, p. 45).

Manufacturers often indulge in 'greenwashing', exaggerating the green or sustainability characteristics of their products (American Society of Interior Designers, 2006, p. 18; Bonda et al., 2012, p. 148; Jones, 2008, p. 85; Spiegel & Meadows, 2006, p. 45). This creates additional difficulties for interior designers when they specify sustainable materials as interior designers rely on available information and transparency from manufactures in aiding the selection and specification process of sustainable materials (Hansen as cited in Bonda et al., 2012, p. 159). As sustainable, green and environmentally responsible design gains momentum manufacturers and those whose success is central to product image could easily exploit it (Bonda et al., 2012, p. 148; Jones, 2008, p. 85) making the task of holistically selecting and specifying materials more strenuous.

2.2.3. Availability

According to Bonda et al. (2012, p. 174), manufacturers have taken note of the economic benefits due to an increased interest and need for sustainable materials. Additionally, manufacturers have also assumed responsibility themselves in the area of environmental stewardship. According to Bonda et al. (2012, p. 174), this dispels the myth and results in sustainable materials being available and accessible. However, Hankinson's (2011, p. 93) study, which is contextual to South Africa, reveals that there is a limited selection of environmentally responsible materials available for interior designers to choose from locally. The study also reveals that the sustainable materials that are available come from material ranges, which have limited variety.

2.2.4. Lack of industry standards, guidelines, and consensus

Previously, practicing designers operated on a trial-and-error basis to negotiate sustainable design challenges, thus discovering the wrong and right solutions. Bonda et al. (2012, p. 24) claim that this problem subsided with the release of Leadership in Energy and Environmental Design (LEED) by the United States Green Building Council (USGBC) in 2000. However, this measuring tool is not without controversy. According to Bonda et al. (2012, p. 24), the USGBC was forced to delay the release of the LEED v4 by an entire year. This was due to too many changes occurring especially to the Materials and Resources category, as the approach to selecting materials has significantly changed. Additionally, industry experts are contemplating how to successfully incorporate the life cycle assessments (LCA) into the material selection process.

2.2.5. The interior designer's education and knowledge on sustainable materials

By using the infamous phrase "what we don't know can't hurt us" Bonda et al. (2012, p. 23) call our attention to the dangers of designing with such a mind-set. They further explain that the need for education, updating information and remaining informed is crucial to all matters pertaining to sustainability. The foregoing discussion of Bonda et al. (2012, p. 23) states that education and accessible information becomes a priority as humans, sometimes unintentionally and due to ignorance, continue to cause harm to the natural environment. According to Bonda et al. (2012, p. 24) sustainable interior design and related concepts have been introduced into curricula at tertiary institutions, and most design professionals are aware of sustainable interior design. However, Bonda et al. (2012, p. 24) explain that due to the "vastness and complexity" of this concept, interior designers can feel intimidated. Interior designers often shy away from energy concerns involving mechanical systems, those not being part of an interior designer's expertise. But, it is evident that this is not the best-case scenario, as Bonda et al. (2012, p. 24) explain, for a sustainable interior to be successful, all project participants should participate from the outset of a project.

The foregoing discussion of Bonda et al. (2012, p. 24) therefore, implies that interior designers should remain constantly informed about new technologies and the necessary sciences relevant to sustainable design. As a result, interior designers can make informed decisions yielding the best outcomes for the client's needs. Furthermore, studies have indicated that the more experience team members have regarding sustainable design, as well as an understanding of the accompanying systems that contribute to sustainable design, the more successful the outcome of the planned project will be.

Esti Jacobs (2015, p. 110) states that there is a country-wide lack of much needed and relevant education at tertiary institutions within the field of sustainable building in South Africa. This results in those responsible for the built environment lacking the necessary awareness, knowledge, and skill in green building principles. Jacobs, therefore, argues that this is as a direct result of the lack of green building principles being implemented in the built environment. Research validates Jacobs's view that the lack of education on green building is often cited as a significant barrier to implementing green design (Landman, 1999, p. 29; Shafii, Ali & Othmon, 2006, p.41 as

cited in Jacobs, 2015, p. 110).

3. RESEARCH METHODOLOGY

In order to identify the factors that restrict and limit designers from specifying sustainable interior surface materials within a South African context, the research adopted a qualitative approach. This approach is situated in the interpretivist paradigm which enables the research to uncover "inside perspectives or real meanings" (Wahyuni, 2012, p. 71) which is essential to reveal what the factors are that influence interior designers when selecting sustainable interior materials. The research for this paper focused on one-to-one, semi-structured interviews as the primary source of data. Participants were identified through an online search. The search for individuals was limited to interior designers practicing as Accredited Professionals identified by the Green Building Council of South Africa or those affiliated with a leading, environmentally conscious, interior design firm in South Africa based in Johannesburg. Interior designers were specifically selected for their decisionmaking powers regarding sustainable interior material selection and specification.

4. FINDINGS

4.1. Lack of market transformation

The lack of market transformation in the market supply of sustainable materials in South Africa has emerged as a prominent factor that influences the selection of sustainable materials. This indicates that the required progress to support the sustainable building sector is slow. The findings revealed that the lack of market transformation is the accumulative effect of the availability of sustainable materials, imported materials, the limited selection of sustainable materials, the necessary and reliable information needed from suppliers and manufacturers, the building industry that has a lack of the necessary knowledge on sustainability, and the lack of regulatory requirements that govern the use of sustainable materials.

Interior designers rely on the market supply for sustainable materials to the building sector. This supply is expressed by a research participant as a "niche" market in South Africa. As a result, there are not enough reliable materials from well-established manufacturers and suppliers available locally. Participants admit that, compared to imported sustainable materials, locally manufactured sustainable materials are not always readily obtainable. The ranges are limited. Information on locally manufactured and supplied materials are not readily available and often not reliable and frequently results in materials being advertised that are riddled with 'greenwashed' information. Installation is not as smooth and lead times are prolonged. As a consequence, South African designers rely on imported materials instead of locally manufactured and supplied sustainable interior surface material.

4.2. Cost of sustainable materials

The majority of research participants indicated that the cost of sustainable materials is the second most influential factor hindering selection and specification of sustainable materials and limiting the implementation of sustainable materials. The participants explained that the impact of the cost on the selection and specification of sustainable materials can be categorized according to the initial cost of sustainable materials which are higher compared to traditional materials, and secondly, the possibility of selecting sustainable materials is influenced by the client's agreement with sustainability and the associated initial cost.

4.3. The base building

Research participants have identified the base building, the building envelope, as an influential factor. One research participant explained that design implementation and material selection will be influenced, due to the constraints and requirements of the design in response to the base building. The base building presents as a factor that can have both a positive impact that promotes sustainable materials selection or a hindering and limiting factor.

4.4. The lack of collaboration among industry professionals in the built environment

Due to the various built environment industry professionals not willing to collaborate with interior designers, it hinders the implementations of sustainable materials. The research participants explain that this is after the fact that interior designers have already specified and selected sustainable materials for interiors. One participant has however expressed that even though this is a barrier to overcome in the implementation of sustainable materials, it is the least of the hindering factors to sustainable material selection and specification.

4.5. Green Building Council of South Africa's Green Star South Africa

Majority of participants have expressed that the GBCSA can have a positive impact on the selection of sustainable materials. Interior spaces can be awarded a Green Star rating by the GBCSA. The GBCSA has developed the Green Star South African (GSSA) rating system, which is the official certification body for South African projects. The objective of the GSSA is to acknowledge and award environmental leadership in the built environment. According to the Green Star Interiors V1 Technical Manual, the materials credit accounts for 30 points of

a possible 110 points obtainable in order to receive a Green Star rating. Thus the participants are motivated by the drive to obtain a Green Star rating which results in it being a major influential factor promoting the selection of sustainable interior materials.

4.6. Aesthetics, innovation and sustainability

Two participants have expressed that the innovative use of sustainable materials to arrive at a sustainable solution has placed aesthetics in the background. Instead, the challenges to innovatively use sustainable materials have become a promoting factor in the selection and specification of sustainable materials. One participant expresses that because of the creative drive of interior design, it allows the designer to create with sustainability as a criterion.

4.7. The 'buzzword'

Participants explain that the marketability of sustainability is promoting the selection of sustainable materials. One participant states that sustainability has become "cool". A research participant explains that the words associated with sustainability such as 'reuse, retrofit and green' have become "buzzwords" that promote the implementation of sustainable design thus promoting sustainable material selection and specification.

5. CONCLUSION

As limited local research on sustainable interior design and sustainable interior materials selection was located, we mostly consulted international sources to inform the research process. Taking into consideration the 20-year time lapse since Landman's study, similar factors are still being identified that are hindering and limiting the selection of sustainable materials. It is concerning that sustainable material selection – which contributes significantly to the sustainability outcome of a building – remains a significant hurdle to overcome. Our paper thus offers suggestive evidence for the need for improved market transformation. Our paper presents the argument for a change in regulatory requirements and improvement in legislation that governs sustainable building practices.

Progress is slow. Taking into account the limited mandatory regulations and the GBCSA's leadership for greening the South African built environment, radical change is still needed. The successful market transformation towards a sustainable built environment will, therefore, require various role-players to proactively take part in a radical transformation. Government regulation and implementation of GBCSA standards cannot function in isolation but need the support of suppliers, designers, and their clients to ensure that transformation is understood and implemented throughout the entire life cycle of a material.

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