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Towards 'regenerative interior design': exploring a student project

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Abstract | Interior designers should design for regenerative systems in order to achieve advanced sustainability, beyond the current 'neutral' sustainable design approach. A broader and more positive regenerative design and development approach supports building social and natural capital within the new ecological paradigm. The interior design discipline has made little contribution to this agenda. This paper thus explores interior design strategies, which relate to regenerative design strategies, through a student project proactively implemented within the Interior Design department at the University of Derby, in an existing 3rd year module. A qualitative research design is used to analyse and code students' proposals, using a constructivist, grounded theory approach. The results present 'regenerative interior design strategies'. These varying strategies are used throughout the project, of which the most *grounded* tap into various social and environmental sustainability benefits. This can inform teaching about sustainability in interior design for a new ecological paradigm.

**KEYWORDS | REGENERATIVE INTERIOR DESIGN, SUSTAINABLE INTERIOR DESIGN,
INTERIOR DESIGN**

1. Introduction

Interior design, as a built environment profession partly responsible for depleting the earth's resources, has the potential to also improve the environment. Within a new emerging ecological paradigm, an overarching concept of 'sustainability' includes using regenerative approaches, and an advanced hierarchical structure of benefits. While 'sustainable interior design' is well documented and researched, contributions to the regenerative design agenda are thin in both education and industry. This research aims to uncover some potential applications of regenerative strategies in an interior design project. The paper explains a proactive teaching strategy wherein the topic of regenerative design was introduced within a student interior design project called *VISION/MAQUETTE* (V/M) at the University of Derby, in an existing 3rd year module, in the 2019/2020 academic year. The objective of this paper is to explore interior design student strategies that link to regenerative strategies. This can provide insight into the ways in which the discipline can improve education about sustainability, and to improve its environmental efforts beyond the current neutral, tool-focused efforts.

After the introduction in the first section, the second section discusses sustainability, interior design strategies, the pro-active teaching strategy and student project. The third section presents the research design and method, followed by a fourth section that presents results and a discussion.

2. Background and review of literature

2.1 Sustainability in the new ecological paradigm

The new emerging ecological worldview is evolutionary, and comprised of living systems (Hes & Du Plessis, 2015). However, sustainability, as an overarching aspiration (Cole, 2012), is not being achieved with the current state of sustainable design, given its skewed sense of measurability and management. Non-integrative and flawed in its focus on the awarding of points, a new paradigm is needed that supports the advancement of the concept of sustainability.

Firstly, sustainability (see Figure 1) has a hierarchical structure that requires three, nested key ingredients (Fischer, et al, 2007), in place of the triple bottom line. As Fischer et al state:

"Societies cannot exist without a functioning life-support system, and economies can only flourish within a functioning social system with effective institutions and governance structures." (2007, p.622)

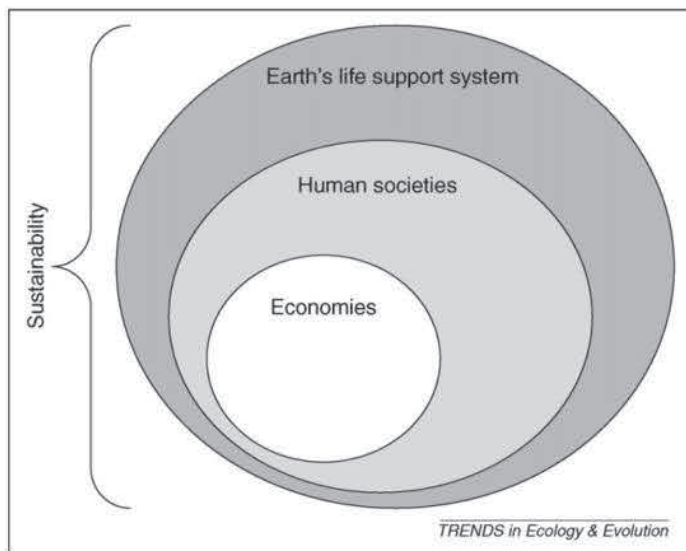


Figure 1. Three nested key ingredients to achieve sustainability (Fischer, et al, 2007, p.622).

Secondly, sustainability that acknowledges the importance of the environment necessitates a regenerating system. In such a system, positive development and regenerative design are key.

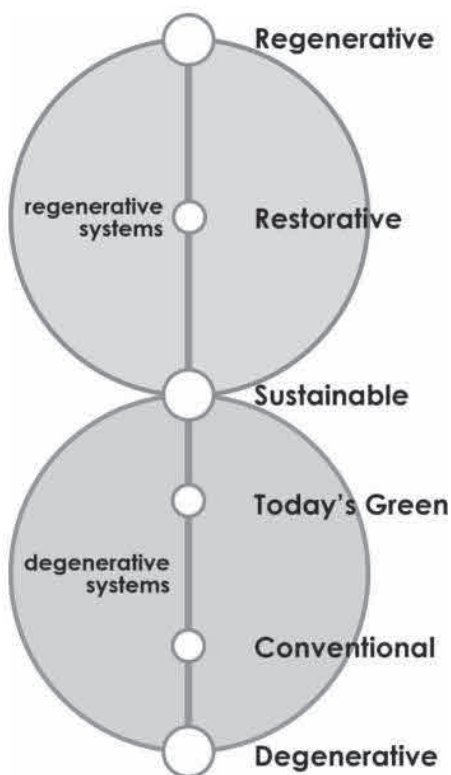


Figure 2. Degenerative and regenerative systems (Plaut, et al, 2012, p.114).

Positive development involves designing “...not just with, or like, nature, but for nature” (Hes & Du Plessis, 2015, p.93) and to “...leave nature better than it was before human settlement” (ibid, p.107). The “...caveat that the outcome should be net positive: more nature, more opportunity and more options” (Hes & Du Plessis, 2015, p.107).

Regenerative design, originally coined as designing regenerating landscapes, refers to a regenerative design and development methodology created by Regenesi (a professional interdisciplinary design team). Like positive development, regenerative design requires positive contributions that increase what existed before human development (Hes & Du Plessis, 2015). It is, however, broader than positive development, surpassing it in its aims for a “reconnection of human aspirations and activities with the evolution of natural systems – essentially co-evolution” (Mang & Reed, 2012, p.26). The concept of sustainability is impossible without regeneration: Figure 2 presents all these design approaches and the need for a regenerating system (Plaut, et al, 2012).

Interior design has long supported the need for energy conservation (Wahl and Baxter, 2008; Theodorson, 2014, p.37). However, links to positive development and regenerative design are less evident in this discipline, yet are clearly necessary, as it is an established profession that contributes greatly to the built environment, as well as to the degradation thereof.

2.2 Typical interior designer strategies

Interior designers have a specific role: to protect public “health, safety, and welfare” (Martin and Guerin, 2005, p.1; IFI, 2011). They make use of various tools and modes of production (König, 2010). Interior designers also design with and for human environmental needs, interior construction, codes and regulations, design, products and materials, professional practice, and communication (Martin and Guerin, 2005, p.52). Drawing from my own experience as an interior designer in industry, and from various sources (Kang 2007; Ballast 2010), interior designers in practice are expected to carry out a variety of tasks for a variety of projects. Some of these everyday interior designer practices (in the design stage alone) include: observing, interviewing, briefing, conceptualising, analysing, measuring, documenting, budgeting, using elements and principles of design, communicating, specifying materials, finishes and furnishings, evaluating products and details, drafting technical drawings, constructing models (digital or physical), understanding and applying building regulations, understanding building systems and services.

As the interior designers role continues to grow more complex (Guerin and Martin, 2004; Guerin and Martin, 2010), and require collaboration (Van Marrewijk, 2014; Theodorson, 2014), the discipline should look toward expanding its expertise, especially in the realm of protecting and benefiting the environment.

2.3 A pro-active teaching strategy and student project

An existing, 3rd year interior design module (6ID501 – Design: investigation and identity) supports a year-long major project which requires students to transform an existing space within a building of significance. The module had no explicit outcomes related to sustainability. This offered an opportunity to encourage students to design with more relevant social and environmental concerns, and less 'superficial' typologies for their major project. Therefore, an introductory project, called *VISION/MAQUETTE* (V/M), was inserted into the curriculum. The V/M project is influenced by my previous holistic teaching strategy (Di Monte-Milner, 2017) used at a previous institution.

This V/M project began with a questionnaire, issued to students in pre-project stage, to gauge their knowledge of the ecological paradigm, sustainability, and regenerative design. Thereafter, students were briefed, as part of a pre-design stage, to design a regenerative, spatial intervention (scaled model), as a bite-sized 'taster' of their upcoming, year-long major project. The intervention needed to: address a social and/or environmental issue; be placed within an inactive/underutilised space within their chosen site; be creative, and engaging; and use a regenerative design approach. It also needed to make use of multimodal forms of communication, to help present a popular and universally-accessible message or slogan. Students were then informed by myself and a supporting associate lecturer (whom I prepared), about the new, holistic ecological paradigm, and regenerative systems. Information was delivered via lectures, discussions, videos, and student-led group presentations. The design stage followed with one-on-one discussions in studio between student and facilitator, and a model-building, laser-cutting session in a workshop. Students submitted a digital presentation. In the final critique, each student presented a final scaled-model of their regenerative intervention.

3. Research design and methods

Situated in the constructivist paradigm, the study uses a qualitative research design, and is ontologically interpretive and epistemologically subjective. I present my own and the associate lecturer's research bias and self-reflection as facilitator. I have also had interest in the topic since embarking on a PhD in 2013. The aim is not to provide absolute truth, but valid truth. A constructivist, grounded theory (CGT) approach was used for content analysis, and coding was done inductively using NVivo™ software (computer-assisted qualitative data analysis software – CAQDAS). A non-linear approach was taken throughout coding so as to avoid forcing data into preconceived codes or categories (Charmaz, 2016).

3.1 The Data

The contextual data is comprised of documents related to the work of 12 students. Some students who took part are from one of the University's international partnering institutions

(HTBLVA Spengergasse). In order to comply, an ethical clearance procedure was followed, to adhere to the EU General Data Protection Regulation (GDPR). The data was gathered throughout the timeline of the V/M project, and is available upon request. Some of the data was prepared by myself, which is thus not raw data. The document types (termed by Charmaz, 2016) include:

- Elicited documents (8):
 - Questionnaires,
 - Questionnaire results (A) (only question 10 and 18 were coded).
- Diverse documents (12):
 - Studio discussions (B) recorded and scanned by author,
 - Final digital presentations (C) submitted online by students,
 - Photographs of the final submitted models (D), taken by the author,
 - Lecturers feedback (E) recorded and scanned,
 - Peer feedback (F) recorded and scanned.

Adding data that has multiple viewpoints is important in CGT to avoid forcing the data. Therefore, peer feedback (F) was also included as data to be coded.



Figure 3. Photographs of a selection of students' final models that were coded (Data D). Photos by author.

3.2 The research time line

The research process did not follow a pre-determined timeline or structure; instead, it inductively evolved as may happen in CGT (Charmaz, 2016).

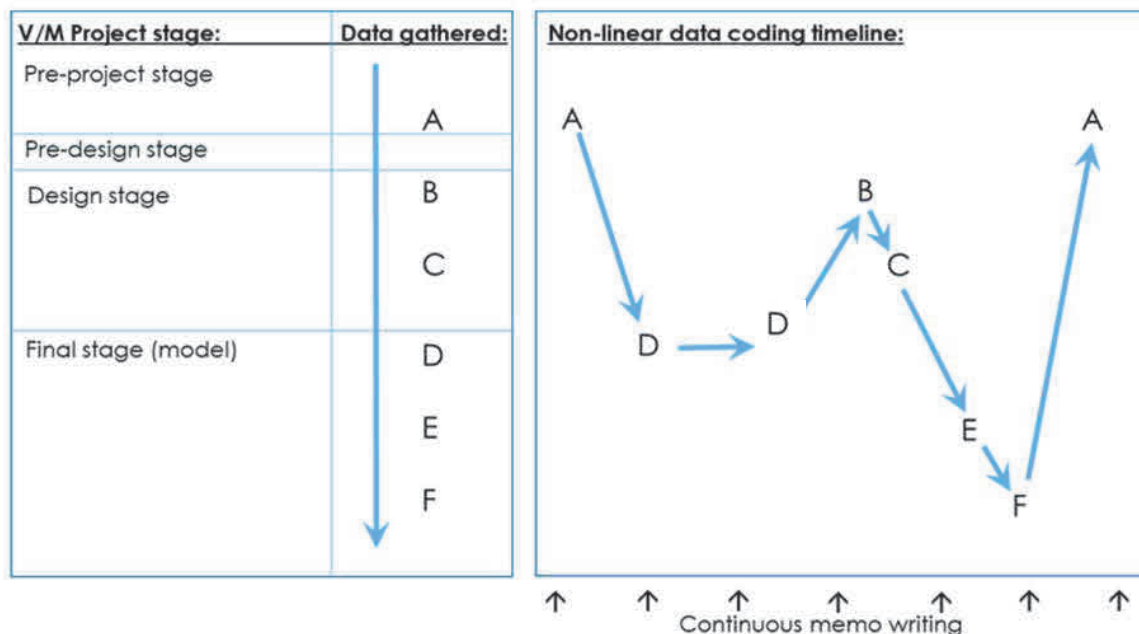


Figure 4. A timeline presenting both the events within the V/M project as well as the research programme (by author).

Although I acknowledge that my coding began with guiding interests (the lens of regenerative approaches based on previous literature I have read), these offered only some ideas for coding. Figure 4 illustrates that the process of coding was non-linear, and data was not coded in the order that it was gathered. Coding was instead iterative and cyclical (some data being coded twice at different stages of the timeline), ensuring that the data was not forced into pre-existing ideas from the literature.

A research journal (available upon request) includes a series of informal memos written throughout the project, which served as a method to clarify and generate codes and categories. These memos include eleven coding memos, three operational memos, and five analytical memos (which were also created in a non-linear order).

The coding method emerged as 'eclectic first-cycle coding' later on in the coding process, even though it never began as such. It initiated with coding of data A as a reflective exercise (to avoid coding into pre-existing categories). Initial coding of data D followed whereby I coded 'everything for everything' to avoid pre-existing ideas. Next, upon reflection, 'process coding' became more suitable for then coding data D, B, C, E, F, and A again. Process coding is coding using gerunds or action words (Saldana, 2016). The research objective was to determine design strategies/actions, so coding with gerunds seemed more appropriate.

Charmaz (2016) supports coding for actions using gerunds in CGT. Parent and child codes were used to make it easier to sort codes as they grew in number. Next, main categories emerged (e.g. wellbeing, senses and community were merged into one) and were raised to the level of focussed codes. Here, the main concerns became apparent. Finally, categories were discussed in terms of existing literature.

3.3 Delimitations

It is important to recognise that the students had already chosen their site and ‘new use’ for their major project before the academic year began. Introducing V/M in the beginning of the module was important, because, and as Bogenstätter states, decisions in “early design phases determine up to 80% of the environmental pollution” (2000, p.376).

The information about regenerative design that was delivered to students was based on a selected number of sources I had previously researched that were relevant to the topic. Students also co-creatively presented information to each other that they themselves found.

Some boundaries for the coding process were created. The quantities of the NVivo™ region percentages were not taken into account in this qualitative study when coding the photographs/images. No text was coded, and instead coding of regions was done due to the various types of sources that needed to be coded. Repeated references to the codes revealed ‘groundedness’, not frequency. It was also important to ignore repeated codes for field notes I had taken myself. Only repeats in the data compiled and presented by students were coded.

4. Results and discussion

In this section, the codes and categories are explained, and are followed by the resulting ‘regenerative interior design strategies’ used by the students (at different stages of the V/M project).

4.2 The codes

At first, I attempted to code any interior design strategy that I could see in the data (not just what I thought could be a ‘regenerative interior design strategy’). For example, I coded what I saw in the data: *waste management*, or a *drawn gathering space*, or an *energy-generating element*. The amount of codes (representing strategies) grew considerably. It therefore became essential to group these codes (as child codes) within higher-order parent codes to make sense of the data. It then became appropriate that these parent codes reflect the stages of the V/M project:

- *Assuming* (a parent code in the pre-project phase);
 - Example of a child code: *waste management*.

- *Intending* (a parent code in the design stage)
 - Example of a child code: *gathering space*.
- *Designing* (a parent code in the final stage i.e. model).
 - Example of a child code: *energy-generating element*.

It is important to note that *intending* was further separated into *intending: initial* (data B) and *intending: final* (data C). This is because some codes represent students' design intentions, and not what they actually implemented in their final models.

It became obvious that child codes needed to reflect actions and so codes were renamed to gerunds, for e.g. *designing for waste management*; *designing a gathering space*; *designing with energy-generating elements*. The action/gerund *designing* used for all the child codes are a culmination of typical designers' tasks like specifying, drawing, analysing, technically resolving etc. These were presented earlier in the paper and emerged from my own industry experience and literature presented by Kang (2007) and Ballast (2010).

4.3 Emergent main categories

The action-type child-codes then totalled 178, and are available upon request. Those that were similar or significant were then raised (merged and renamed where necessary) into a total of 7 main categories (i.e. main strategies). Five of the seven main strategies fell in the parent *Assuming*; six in the parent *Intending*; and six in the parent *Designing*. Other unrelated strategies that were insignificant fell off.

The table below presents the five most significant of the main strategies, which I term 'regenerative interior design strategies'. They appear in bold, and in order of groundedness, in the table below. It is clear that different design strategies appear more grounded in some stages of the project than in others.

Table 1. Resulting main 'regenerative interior design strategies' in order of groundedness, with those most significant in bold.

V/M Project stage:	Data / Diverse documents:	Parent codes:	Main categories/strategies (out of many merged child-codes):
Pre-project stage	Data A	<i>Assuming</i>	<i>Designing for nett positive flora and nature</i> <i>Designing to add value to existing</i> <i>NA unsure or not answered</i> <i>Designing to recycle reuse reduce</i> <i>Designing for and with communities</i>
Pre-design stage	N/A	N/A	N/A
Design stage	Data B&C	<i>Intending: initial</i> <i>intending: final</i>	<i>Designing for and with communities</i> <i>Designing to add value to existing</i>

			<i>Designing for nett positive flora and nature</i> <i>Designing typologies</i> <i>Designing to recycle reuse reduce</i> <i>Designing with a regenerative design tool</i>
Final stage	Data D, E, F	<i>Designing</i>	<i>Designing for and with communities</i> <i>Designing to add value to existing</i> <i>Designing for nett positive flora and nature</i> <i>Designing to recycle reuse reduce</i> <i>Designing typologies</i> <i>Designing with a regenerative design tool</i>

4.4 Discussion

This research uncovers a possibility of seven ‘regenerative interior design strategies’. The five most significantly grounded of these are explained in order of significance below. It is important to note that the term ‘*designing*’ is repeatedly used in the category and child code names. I use the term in this study to represent only some of Kang (2007) and Ballast’s (2010) designer tasks, because it was a student project, and not an industry-related project. *Designing*, therefore, includes the act of researching, drawing, documenting, specifying, communicating etc.

Regenerative interior design strategy 1: Designing for and with communities

This main strategy is a consolidation of two strategies: *designing for wellbeing*, and *designing for and with communities*. Examples include designing for: the senses, spirituality, education, healing, mental health, physical wellbeing, a human-nature-connection, health and safety, comfort, interconnections, equity, accessibility, own voice, tolerance, respect, social activities, multi-cultures, future generations, local skills and art, and giving back to the community.

This category thus, in sum, is about designing for social benefits (see Figure 5), and is the most grounded of all five strategies. This supports the notion that interior designers “...shape spaces that shape the human experience” (IFI 2011). These strategies not only support design that is *for* society, but design *with* society. We know from research that for interior design to become regenerative, designers should focus on human issues (Sorrento quotes Ellison in her article, 2012, p.41; Pliess, 2011; Theodorson, 2014, p.37), because the occupants are emerging as key players responsible for the performance of buildings (Theodorson, 2014, p.42). Regenerative design also values the ‘who’ of a place through

design that can “continue to engage with the stakeholders long after the designers and builders have left” (Hes & Du Plessis, 2015, p.119). Because this main strategy further aims for designing to revive and re-value the community's skills and stories, it also promotes the regenerative ideal of designing for 'story of place'. The strategy of interconnecting people to a natural setting or 'place' also promotes co-evolutionary ideas. After all:

“[h]umans are part of nature and as such have a contributive role to play in the health and evolution of the living systems of which they are part, continually participating as nature and developing the potential of both the system and its inhabitants.” (Hes & Du Plessis, 2015, p.112)

Regenerative interior design strategy 2: Designing to add value to existing

This second most significant strategy represents: restoring, repurposing, improving the existing, adding uniqueness, or celebrating an existing building's uniqueness and character. Even though the major project already required students to reuse an existing building prior to this project, these strategies appeared to offer more than simply designing to reuse the existing.

In reviewing theory of regenerative design, this category can also link to 'story of place'. Revaluing existing stories about the place, and valuing uniqueness by improving a space, can help shape “relationships between people, the place in which they reside, [and] past and future generations” (Hes & Du Plessis, 2015, p.119). Understanding the existing site, evoking ownership of the site and ongoing learning and co-evolution of people and their place are important concepts in regenerative design. Although this category seems to respond mostly to the economic sphere of advanced sustainability modelling (see Figure 5), the added focus on stories means that the category straddles social and economic benefit.

Regenerative interior design strategy 3: Designing for nett positive, flora and nature

This strategy, initially called *designing for and with flora*, later merged with *designing inspired by nature*, as students referenced biomimicry and biophilic design. The strategy then also seemed to represent the use of energy-generating design, which reflects the nett positive contribution to natural resources synonymous with regenerative design.

A current trend in interior design is to add restorative natural settings in interiors to benefit occupants psychologically (Bringslimark, 2011, p.484. Interiors that use natural elements as positive distractions promote wellness (Ulrich, 1991, p.107), since “people particularly like to see natural contents” (Ulrich, 1993 in Bringslimark, 2011, p.470). This category can be positioned in the environmental sphere of improved sustainability (see Figure 5), while also benefitting society. This is most interesting, as it suggests the potential for interior design to not be solely for economic and social benefit, but for the environment that both of these exist within as well.

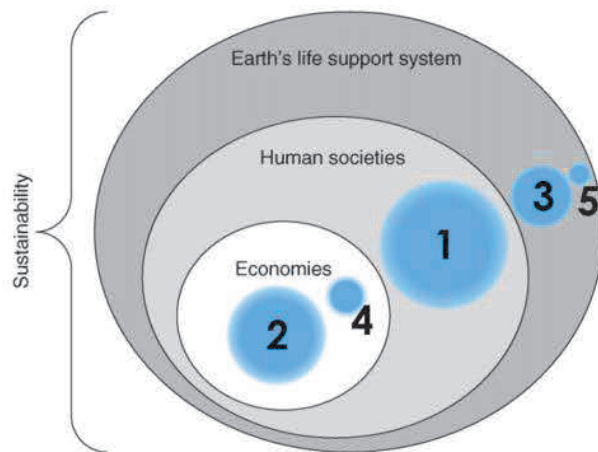


Figure 5. The proposed 'regenerative interior design strategies' (1-5) within an advanced model of sustainability (Fischer, et al, 2007, p.622, adapted by author).

Regenerative interior design strategy 4: Designing mixed typologies

This strategy – of designing for mixed typologies and spaces (like consumer, creation, consultation, educational, and commercial spaces) – did not seem to fit with any other aforementioned strategy. At first, it did not appear to be a regenerative design strategy, however, a design may have economic benefits if it includes a rich variety of spaces for an array of functions that benefit multiple users' needs. It adds on-going viability, which is an important element of designing for 'place as core' in regenerative design (Hes & Du Plessis, 2015, p.117). In contrast, design of unsuccessful or one-dimensional typologies will lead to more unused space and a wasted chance to generate any nett positive social or natural resources.

Regenerative interior design strategy 5: Designing to recycle, reuse, and reduce

This strategy includes using upcycled furniture, reusing waste, charity bins, recycled materials, waste and water management, and designing for multi-functional use. This mode of design aims to efficiently use and manage available materials and resources and benefits the environment in a similar way to the third strategy. If these two are then linked, this joined strategy would become the third most important category. This means interior designers can contribute to the environment even more than initially envisioned. Figure 5 presents this concept.

It is important to conclude that interior design students design with different strategies and at different stages of the project. They showed a better inclination to design for the environment at the beginning of the project, while designing for social benefit was most significant in the middle and end of the project.

4.5 Future recommendations

While the results obtained are useful, the number of participants was small, so the project can be repeated for further insight (a repeated project is already underway). These few student projects nonetheless offer some potential for developing 'regenerative interior design strategies' that can enable regenerative systems. This set of examples can be used to inform interior design students in future, and to promote the idea of designing for and with the environment throughout a project. It could further be beneficial to code these students' final projects at the end of the academic year, in order to see the extent to which they continued to use regenerative approaches. This could reveal further strategies, or uncover those that were never implemented in the end at all.

The project, however small, did include a mix of local and international partnering students. It could be interesting to study the differences in strategies used among these different cultures. A more collaborative student project could also have revealed even richer regenerative design strategies, and would have further supported Williams's (2012) idea that transdisciplinary approaches are key to designing regenerative places. As Williams notes, regenerative design has education and training challenges (2012), so this project can inform the way in which educators package whole/living systems thinking into existing curricula.

4.6 Limitations

This class was made up of a small number of students and participants, however the project was repeated in 2020 and is already being researched to offer further insight, because with this small data set, design strategies and responses cannot be generalised. These students have also not yet been fully employed as practising interior designers, so their design strategies are limited at this stage.

Students were also only shown specific information, which I am familiar with (having read about the topic since 2013), and the only nett positive regenerative design examples I was able to present to them were urban, landscape, architecture and product design examples. This could have influenced their own design strategies.

Furthermore, many students in the class are German-speaking, so although complicated jargon used in questionnaires and presentations was explained, at times concepts could have been misinterpreted. Regenerative design also presents some confusion in that it is a complex issue with no fixed steps to follow (Tainter, 2012).

5. Conclusions

Interior design needs to respond to the ecological paradigm of an advanced notion of sustainability by adopting regenerative approaches. Sustainable design is facing criticism. There is also little literature suggesting potentials for 'regenerative interior design'. A proactive, introductory V/M student project, inserted into an existing curriculum, uncovers some interior design strategies that can be used to design for regenerative systems (which is

finally proposed in this research as 'regenerative interior design strategies'). It also shows that students' strategies changed at different stages throughout the project. It also showed that there were five most grounded strategies, the most significant having social benefit. Some strategies did offer environmental benefit, suggesting that interior design can in fact also benefit the environment. These environment-focussed strategies were more significant at the beginning of the project however, and can offer insight into how the discipline can better teach and design for and with the environment, within the ecological paradigm. After the introduction in the first section, the second section presented sustainability in the ecological paradigm, followed by typical interior designer strategies, and the pro-active teaching strategy (where the student project was then described). The third section explained the research design and method, followed by a fourth section that presented results and a concluding discussion.

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