The Nature of Design

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Integrating Biomimicry: A Teaching Tool for Interior Design Education

Sarah Agne

NARRATIVE

Biomimicry is an emerging term appearing from bios, meaning life, and mimesis, meaning to imitate. The term became popular by scientist and author Janine Benyus in her book Biomimicry: Innovation Inspired by Nature, where she defined it as a new science that studies nature’s models and then imitates or takes inspiration from these designs and processes to solve human problems (Benyus, 1997). Benyus suggests looking to nature as a model, measure, and mentor and emphasizes sustainability as an objective of biomimicry.

The field of interior design has been highly impacted by the sustainable movement, and recently designers have been using the biomimicry approach to solve design challenges (Biomimicry Guild, 2009-10) (HOK, 2008). Foreseeing the demand for this concept, interior design educators understand the value of integrating biomimicry within their curriculum. However, is academia really understanding biomimicry and utilizing the concept to its’ fullest within the classroom? Are there more effective ways to integrate the concept for maximized outcomes?

The following research grew from an investigation on the subject of biomimicry. An initial literature review defining biomimicry and identifying innovative biomimetic solutions, linked the concept to the field of interior design. A comprehensive review of studies referring to interior design teaching tools was conducted to gain a better understanding of how current interior design courses were being taught; establishing a method for analysis of how academia is currently using the biomimicry concept (Roshko, 2010). An exploratory Internet search revealed that universities and colleges have integrated biomimicry in their curriculum (Figure 1).

A survey was distributed to over 500 members of the Interior Design Educators Council (IDEC) where 50 graduate and undergraduate professors from both CIDA-accredited and non-accredited programs responded to answer the following questions: “How has biomimicry been used in education, specifically interior design education?” and “Have interior design educators used biomimicry as a teaching tool?” (Figure 2, Figure 3) Using the data from this survey, an undergraduate interior design studio was structured around biomimicry
principles, which provided the opportunity for interior students to create more sustainable and healthier interior technologies and designs.

The structure of this eleven-week studio differed from a typical studio that would generally proceed linearly through the interior design process (Figure 4). The change allowed the course to roll out in a spiral shape which spawns from the notion that, “Life Works in Cycles” (Hoagland & Dodson, 1998. p.21). Utilizing nature’s cyclic behavior, the course content was covered multiple times allowing the students repeated encounters with the same material. With students deepen their knowledge, project development, and sustainable awareness. If students did not understand a concept, or fully develop a design the first rotation, on their next rotation they had a chance to expand upon the learning material.

This research suggests that with the new course structure, student learning improves and students are more aware of sustainable concepts. As current teaching methods change based on sustainable needs, and as the field of interior design begins to understand the value of biomimicry, it becomes a new relevant concept for consideration by educators for not only instruction but also an application as a teaching tool.
Optimistic Projections on the Cultures of Mass Consumption and Waste: *Embracing Hygiene Paranoia, Product Addiction and Nomadic Lifestyles in Sustainable Building Design*

Amy Campos  
California College of the Arts

**NARRATIVE**

Transformative material processes (planned obsolescence, disposability, and biodegradation) can provide a new model for reconciling cultural desires for more with sustainable mandate for less. Rather than viewing the design of the built environment as means to a single, complete “finished product”, transformative material processes can be applied as opportunistic and systematic strategies for designed environments that can productively evolve over time.

Current sustainable strategies in the architectural field are dominated by a conservative approach to use less, make less and consume less, epitomized by the ubiquitous attitude of “Reduce, Reuse, and Recycle”. This austere sentiment for ‘less’ is accommodated by building for long-term durability. There is an abundance of underutilized built space in the world today, particularly in areas with drastically shifting industrial resources like Flint and Detroit in the US. As housing in these areas are abandoned, scavengers increasingly strip the structures of recyclable materials (aluminum siding, copper pipes, etc) leaving the bulk of the building material left unprotected and exposed to accelerated decay. Ultimately, the ability to recycle proportionately small amounts of the building material renders a large portion of the material unusable again, producing a huge amount of unnecessary waste. These blighted urban areas are the physical embodiment of the result of the material inefficiencies inherent in our current building systems. Because we design for a building’s durability in terms of total assembly, we overlook opportunities to think of the built environment in terms of replaceable assemblies of varying durabilities.

A useful model for this component-based way of thinking in the built environment is found in the fashion industry in the mid-19th century. The durability cycle of clothing is a logical extension of the material conditions required for the human body and the climatic protection that clothing provides. Disposability first arrived in mass production with the widespread use of paper collars, cuffs and shirtfronts in men’s fashion. Shirt parts were inexpensive, widely available and easily disposable. They omitted the need to replace an entire shirt once the visible portion was stained or worn. The reconstruction of the shirt to provide for single disposable components lengthened the life of the body of the shirt and allowed for durability to
adjust according to the use patterns inherent in particular areas of the shirt structure. By
acknowledging a variation of needs for durability in this case and making something
strategically and variably disposable, overall durability and functionality were extended with
minimal waste.

Using the paper shirt collar as a model, this paper will propose a new mode of material
assembly in the built environment that embraces obsolescence, disposability and
biodegradability as a new trajectory for the sustainability movement. This paper will advocate
for the architectural field to rethink the construction assembly of buildings and think in terms of
component-based variable durability of materials.
Interior Urbanism: Redirecting urban development along San Francisco's Market Street from the inside out

Amy Campos
California College of the Arts

NARRATIVE

The proposed presentation includes a description of an innovative studio approach tested in a Junior undergraduate Interior Design studio taught in Spring 2010. This curriculum was developed with the assumption that the discipline of Interior Design is positioned perfectly now to direct and lead a new way forward, sustainably, programmatically, urbanistically, and aesthetically for the entire built environment. The intent for this course was to expand the project-base and influence these future designers will have. Students applied their specific expertise as interior designers (space planning, ergonomics, programming, circulation and aesthetics) at a much broader urban scale. The studio began with group research and a field trip to Las Vegas to frame an approach to a given problem site: a former billiards building on the blighted section of Market Street in Downtown San Francisco. Through research, strategic observation and applied skill, the students produced an in depth proposal for the billiards building that would revitalize a prominent section of San Francisco. The outcome of the studio was a series of extremely innovative projects and a group of highly skilled future interior designers who were empowered to join and, more importantly, lead conversations about the built environment beyond the traditional disciplinary boundaries of interior design. A full description of the project and studio structure, as well as student work will be described in the presentation.

The studio brief is as follows: “The evolution of the Las Vegas strip from the 1960s (car centered exterior promenade) to the present (human centered continuous interior) will provide a starting point for our study of a new programmed POPOS (privately-owned public open space) interior on Market Street in San Francisco. The studio will function as a design research think tank, centered on the question of the new leisure center for a post-economic crisis age. Given the significant economic shifts in the last few years, and in the years to come, we will need to consider and address a new attitude towards consumption, community, travel and leisure. How can innovative programming and design maintain accessibility to leisure for a majority of the population? Can we accept our previous expectations for higher qualities of life and provide for them in new and
innovative ways or should we use this project to help shift cultural values and recalibrate our expectation for excess? By bringing the Las Vegas Strip inside on Market Street and meeting the provisions for POPOS, as described by the 1985 Downtown Plan for San Francisco, we will consider programming for the site as interior urbanism. Locally specific criteria for design offered by San Francisco and the Market corridor will frame our approach to the problem, while the Las Vegas strip will provide strategies to address these local concerns. Programmatic zones included in the project will be determined through site, program and precedent research. Each student will participate in imagining the site in terms of large-scale infrastructural programming and will finish the semester with a detailed design for his/her proposed programmed POPOS."
Food Bank Studio: Warehouse Improvement Design Proposals

Amy Campos
California College of the Arts

NARRATIVE

The proposed presentation includes a description of a community-outreach based studio approach tested in a Senior undergraduate Interior Design studio taught in Spring 2011. This curriculum was developed with the assumption that the discipline of Interior Design is positioned perfectly now to direct and lead a new way sustainable and socially-conscious way forward for the built environment. The intent for this course w to expand the project-base and influence these future designers will have. Students applied their specific expertise as interior designers (space planning, ergonomics, programming, circulation and aesthetics) to an underserved population – a non-profit Food Bank in Oakland, CA serving people in need in Alameda County. This course addressed design issues raised by the operations and interaction of several different partners including: interior design students, Alameda County Community Food Bank (ACCFB) staff, volunteers, and their partner agencies, as well as the public they support. Over the 16 week semester, the students developed design strategies for the renovation of food storage, collection and distribution of food, office and event storage staff and volunteer kitchens, nutritional education facilities, and shopping facilities at the site of the ACCFB, as well as, identifying environmental graphic branding and wayfinding opportunities throughout the facility. Working in groups or individually, the students proposed overall improvements to their distribution warehouse facility (including new program spaces, efficient storage and circulation systems, maintenance and have identified opportunities for new or enhanced programs). In addition to overall space-planning, the students developed one or two detailed areas in depth, including material exploration, furniture and finish specification and budgeting. The selection of topic, user group, site and client was intended to energize conceptual ideation and theoretical consideration within the framework of tangible design parameters set by client operations, desires and budget. Students were encouraged to push the conventional boundaries of the discipline to more fully consider alternative approached to a creative project and/or engage collaboratively in approaching a design problem a produce an innovative proposal. This studio is the most advanced studio of this interior design program and the most demanding for the students. Students were asked to focus on the technical realities of the practice, demonstrating an understanding of the relationship of materials, systems, furnishings, and other assemblies. In general, all of the design skills learned in prior studios were deployed in the generation of a design f the complex problem of renovating the
existing food collection, storage and distribution floor, as well as, the nutritional education, and shopping areas of the existing Alamed County Community Food Bank facility in Oakland, CA. A full description of the project and studio structure, as well as student work will be described in the presentation.
Preference and Meaning of Natural Interior Attributes

Sherill Halbe
Montana State University

NARRATIVE

This in-progress qualitative study aims to establish an understanding of how people give preference and meaning to natural interior attributes with the intent of discovering appropriate ways to emulate nature in interior design. Initially, a five point Likert Scale will measure degrees of importance that participants give to interior design elements in preferred interior places. The sample will consist of students and the general population. In addition, participants will be asked to describe preferred places and important interior features to ascertain whether or not particular elements have associations with natural characteristics. Follow-up interviews, content analysis, and case study methodologies will investigate preferred natural interior responses with the objective of discovering emerging findings and impressions. The proposed study will report its on-going findings during the presentation and solicit discussion and suggestions for further consideration.
Cultural Sustainability within High-Technology Environments

Julie Myers
IDEC, IIDA, ASID
Cornish College of the Arts

NARRATIVE

A designer’s field notes on Southeast Asian Post-Modernist Era of Product Manufacturing & Development. This case study explores Cambodia's Tonle Sap Region providing insight surrounding global perspectives for the classroom and beyond.
Healthcare Interior Design: Finding the Way to Brand Identity

Mandy Simons

NARRATIVE

Purpose and Goal: The purpose was to better understand the relationship between interior design, wayfinding experience and brand identity. The goal was to provide a framework to better understand wayfinding and brand identity as a healthcare interior design problem, and explore design strategies.

Background: Research methods and design investigation were based on wayfinding constructs and branding framework developed from review of literature. Wayfinding constructs included concepts of wayfinding (Passini, 1996, 1984; Arthur and Passini, 1992), cognitive mapping theory (Downs and Stea, 1977), concepts of spatial understanding (Lynch, 1960) and principles of wayshowing design (Mollerup, 2005; Arthur and Passini, 1992). The branding framework was defined by the author and based on basic branding concepts (Vaid, 2003; Healey, 2008; and Franzen and Moriarty 2009).

Research Methods: This was a qualitative approach that used comparative case study of medical office buildings in two healthcare organizations. The first part of the study involved analysis and observation of the site designated for design application, and interviews with design and marketing staff. The second part consisted of interviews and a comprehensive tour led by interior design project managers at buildings of another organization.

Design Investigation: The approach was to develop a design solution in a manner that demonstrated knowledge gained from the research study. Justification of design decisions was made in reference to wayfinding constructs, branding framework and findings from the study.

Results: Analysis resulted in discovery about the relationship between interior design with that of wayfinding experience and brand identity in context of the healthcare environment. Additional discovery related to revelations about Lynch’s concepts when applied to interior environments.

The project resulted in the following discoveries:

Wayfinding:

• Design for interior spatial clarity and good wayshowing are complimentary goals.
• Spatial clarity and good wayshowing design contribute to a positive wayfinding experience.
Branding:
  • Wayfinding experience is a contributor to brand identity, but to effectively improve
    brand identity, wayfinding experience needs to be part of an overall branded
    environment experience.

Wayfinding and Healthcare Design:
  • Creation of spatial clarity in support of wayfinding is especially important in
    healthcare settings because it addresses wayfinding needs people may
    experience due to diminished cognitive ability caused by stress or other
    problems.
  • Sign design that supports a sequential style of wayfinding supports the needs of
    people in healthcare settings because it does not require a high level of cognitive
    mapping ability to utilize.

Lynch Concepts:
  • Lynch’s concepts for understanding urban environments can be a useful
    approach for applying elements and principles of design for creating clarity in
    interior environments.
  • A person’s point of reference from within a space may alter spatial perception or
    understanding of elements in the space.
  • Lynch’s concepts of spatial understanding, when applied to an interior
    environment, suggests there may exist additional layers, or dimensions of spatial
    understanding to be identified for interiors. For example, landmarks in an interior
    may be understood hierarchically. A landmark could be understood as “primary” when
    observed in relationship to a less prominent, or “secondary” landmark.
Service-learning Projects: From Interior Design Studios to a Hospice Home

Anubhuti Thakur
California State University Northridge

NARRATIVE

Service-learning can be an effective pedagogical tool to present students with learning opportunities that go beyond the confines of the classroom (Campus Connect, 2008). Most importantly service-learning can enable students to develop effective relationship with the community that they will serve as professionals (Young & Spear, 2005). This presentation traces the involvement of interior design students with a local non-profit hospice care organization. The most significant learning outcomes of the series of projects was the increased awareness among interior design students about the impact of their design decisions, and their responsibilities toward special needs populations in their community.

Our Community House of Hope (OCHH) is a non-profit organization founded by a group of healthcare professionals and community leaders. The organization is working toward creating a free-standing, eight-bed hospice home. OCHH also aims to serve as an education center for students interested in learning about end-of-life care (OCHH,2011). Interior design students at the junior, senior, and graduate level were involved with OCHH over a period of three years through different projects undertaken in class. Students had opportunities to hear from the healthcare professionals, to visit a hospice have discussions with a client, organize events, and develop significant insights in an aspect of design and life with which they were largely unfamiliar.

The proposed presentation will trace the projects from various classes, some undertaken in collaboration with other fields like engineering and theatre. In Fall 2008, students in the interior design senior studio designed prototypical homes for OCHH receiving various opportunities to get the client’s feedback and critique. Graduate students provided research-based input to the design studio and created artwork for CHH to use in their home. In Fall 2009, students in the junior interior design studio partnered with a student from materials engineering to provide OCHH additional design ideas and material selections. Another graduate class of interior design students partnered with theatre students to organize a play reading as a fundraiser for OCHH in Spring 2011.

Students showed special appreciation for the opportunity to meet, speak with, and be critiqued by a client. Working on a project that could potentially materialize provided students with
additional motivation. A surprising number of students at each level note that they did not know about hospice and hospice care before they heard from the CHH board members. The projects were successful at each level in raising the students’ awareness about their community and designers’ role in community affairs.

As of Summer 2011, OCHH has acquired a rental property to start offering their services while they continue to collect funds for their own building. They are using ideas from student designs from both studios, as well as the artwork created by the graduate students in their rental home. The design of the rental property based on students’ design ideas is the beginning, though far from the culmination of student work having significant influence in their community.
Design for Korean Architecture

Sohee Kim
Tongmyong University

In a real space, the finishing material is what we actually face and touch. While the modern design tended to focus on the sense of sight as well as function, shape and logic, the recent work of design showed that it started paying attention to various senses of human being to occupy the place. Martin Heidegger urged that the life of human being was closely related to 'the sense of touch'. As a great part of information is consisted of sense of sight and touch, the sense of touch in indoor space can be revealed by materialization of a property. The method for interior design varies largely depending upon the application methods, shapes, texture, and presentation methods of finishing materials. Based upon the knowledge of physical properties of finishing materials, I have worked on the interior design through the theoretical and practical approaches.

Korean Architecture Convention & Exhibition is annually held in an international scale. This exhibition was opened at Bexco, the biggest convention center in Busan, Korea on September 28th 2010. I designed this project as totally display director and set up the concept & design program. This project was focused on “Beyond Boundary” and explained by Conservation & Innovation. The exhibition space was over 340 feet long and 135 feet's width. I tried to express conservative & innovative design as the artificial form and natural material, and showed coexistence between natural & artificial in the space. The diagonal axis across the whole space, main passage and circulation, leaded to one eye and made people gather this way. All of the exhibition spaces were filled with colorful partitions, diverse-sized panels and objects. The display contents and showing methods were very artificial and various, for the space should be given to many architects and designers. So it is very important to select finishing materials and their application for interior construction because the space should be seen as one.

Among the rigid line, the natural elements were needed to offer the comfortable feeling for the visitors. I would like to highlight the reasonable material selection for diverse architectural space through natural design by using the textile like yarn and fabric. The fabrics, most closely resembles human skin with soft, make the space more relax and let people stay longer in the area. The psychological application from the texture of material actually generated emotional design results. I took the fabric and the yarn as emotional material both the visual and tactile design. And I gave a color change gradually and paid attention to eye contact through the long diagonal passage. The color of fabric is blue tone that is natural symbol of this city, Busan, is located near the sea. I dyed the fabric as gradation like the ocean color. I twisted the thick yarn, painted the gradation color without the boundary and made the object as the entrance of the every exhibition space. The color image of the gradation was indicated the topic of beyond boundary, too. The space of Korean Architecture Convention & Exhibition 2010, the international cultural big festival, created structural color and material to develop the condition of finishing material and natural emotion of human. This is the process of making the new
consideration on the materials in exhibition space as the background, averting unified exhibition plan and simplified chemical and physical approaches to the materials.
Figure 1: We can touch the hanging fabrics directly as walking the diagonal corridor.

Figure 2: Study model & Lay out plan, There are one way and rotating circulation.
Inhabiting Risk 4

**Figure 3:** Axonometric

**Figure 4:** Fabric texture makes the space more relaxed and entices people to linger.
Figure 5: Material experiment for sampling-1. Color was graduated like the ocean containing the beautiful nature of Busan in Korea.

Figure 6: Material experiment for sampling-2. Thick yarn was twisted and painted without boundary.