DESIGN AN ENGAGING AND STIMULATING LEARNING COMMUNITY THAT SUPPORTS STUDENTS MULTIDISCIPLINARY, AND INTERACTIVE LEARNING

A graduate project submitted in partial fulfillment of the requirements for the degree of Master of Science in Family and Consumer Sciences

By

Victor Campos

May 2016
The graduate project of Victor Campos is approved:

_______________________________  __________________________
Judith Griffin, MA                        Date

_______________________________  __________________________
Yoko Mimura, Ph.D.                        Date

_______________________________  __________________________
Anubhuti Thakur, Ph.D., Chair            Date

California State University, Northridge
ACKNOWLEDGEMENTS

I would like to thank my committee members for their expertise and involvement given to assist me with the process and completion of my graduate project. Dr. Thakur, for suggesting this project topic, her advice and direction throughout my design education and for the reality check I desperately needed early in my education. To Dr. Mimura, for her encouragement, support and valuable feedback provided for my project, and to professor Griffin, for providing helpful advice and perspective in design. To my family for the invaluable support and encouragement that has always given me the motivation for my research, and to my lovely wife Victoria Duran, who has supported me throughout this whole process. I can’t put into words how appreciative I am for you.
Table of Contents

Signature Page ......................................................................................................................... ii
Acknowledgement .................................................................................................................. iii
List of Figures ........................................................................................................................ v
Abstract .................................................................................................................................. vi

CHAPTER I – INTRODUCTION ................................................................................................. 1
   Statement of the Problem ..................................................................................................... 2
   Purpose of Study ................................................................................................................ 3
   Justification of Study .......................................................................................................... 3
   Scope of Project .................................................................................................................. 5
   Definitions .......................................................................................................................... 6

CHAPTER II – LITERATURE REVIEW ...................................................................................... 7
   Learning Community ......................................................................................................... 7
   Learning Spaces ............................................................................................................... 9

CHAPTER III – DESIGN CONCEPT .......................................................................................... 11

CHAPTER IV – DRAWINGS OF PROPOSED LEARNING COMMUNITY .............................. 13

CHAPTER V – DISCUSSION OF PROJECT ............................................................................. 17
   Conclusions ....................................................................................................................... 18

REFERENCES ....................................................................................................................... 19
List of Figures

Figure 4.1 Existing Learning Center Site Plan .................................................................13
Figure 4.2 Proposed Space Layout ..................................................................................14
Figure 4.3 Site Plan ...........................................................................................................14
Figure 4.4 Interior Collaboration Space ............................................................................15
Figure 4.5 Informal Gathering Space ................................................................................15
Figure 4.6 Individual Space ..............................................................................................16
Figure 4.7 Exterior Collaboration Space ............................................................................16
ABSTRACT

DESIGN AN ENGAGING AND STIMULATING LEARNING COMMUNITY THAT SUPPORTS STUDENTS MULTIDISCIPLINARY, AND INTERACTIVE LEARNING

By

Victor Campos

Master of Science in

Family and Consumer Sciences

Traditionally the built environment of educational institutions was designed to accommodate instructor centered pedagogy, a static non conducive environment constrained by its inability to accommodate student diversity and technology. The purpose of this project was to study existing literature and design an engaging and stimulating learning community consisting of interconnected physical spaces that support students multi-disciplinary, and highly interactive learning. Gestalts principles of perception and visual cues were used as criterions for the development and design of the learning spaces located in the Extended Learning Center at California State University, Northridge (CSUN). Understanding the selected concepts of Gestalts psychology helped in creating a prototype of a learning community for CSUN students. Consolidation of all relevant literature review articles describing different learning models, built-environments, and technology help support the need for integrating learning communities into college and university built environments. The Extended Learning Center at California State University, Northridge was selected for this project because of its diverse multi-cultural target
population; ranging from the freshman student pursuing a career to the returning professional interested in advancing career.
CHAPTER 1

Introduction

During the mid-20th century, the increase of student enrollments impacted the design and purpose of higher education built environments (Brickford & Wright, 2006). Instead of designing spaces with students and faculty in mind institutions were focused on maximizing occupancy space, leading to static instructor centered environments that lack the technology and flexibility students seek today. Students, having grown up in a networked world, arrive on campus with high technology expectations. They regard visual media as their vernacular, multitasking as a way of life, and project-based group work as their preferred mode of learning. They consider technology a vehicle for social interaction that occurs through instant messaging, mobile phones, wikis, blogs, and student-owned laptops (Lombardi & Wall, 2006). According to Bell (2014) educational facilities that create a sense of student ownership have the power to further engage students. Early faculty and student involvement in the design process of any school project can foster a feeling of community ownership that will create a better marriage between aesthetics and functionality.

It is time to change the current process for planning of space design and acknowledge community. Technology has become an integral part of our lives and it is important to realize that, especially in the case of learning spaces, design outcomes and processes intertwine. New forms of blended learning space will evolve over time as technologies change, people adapt, and new practices emerge. Academic institutions that reconsider how campuses are designed, in both a physical and technological sense, will position themselves to exploit future technologies. Among the most successful institutions will be those that find ways to infuse student ideas into the design process, harnessing the energy and talents of the Net Generation (Milne, 2006).
Society should care about learning in community for two primary reasons. First, learning is a social process that works best in a community setting, thus yielding the best use of societal resources. According to Peter Ewell (1997) evidence documenting the importance of community in learning is "overwhelmingly positive, Second, learning in community will have an important role in preparing students for their work-life to come. Some companies today call for graduates with different perspectives to collaborate across traditional disciplinary and business lines. In other words, community-centered education will help prepare graduates to live and work in a world that requires greater collaboration.

California State University, Northridge is in the process of building an Extended Learning Center (ELC) that supports a technological pedagogy that encourages social interaction. The new center will feature technology that will support the use of mobile devices in both formal and informal learning spaces. Where spaces are designed to adapt to the users’ needs thus allowing newer generations to engage and interact with this technological pedagogy.

Statement of the Problem

For several decades we have been creating spaces that promote mass production, resulting in instructor centered environments based on a model in which education involves transferring information. Today’s technological devices have encouraged students to seek engaging and stimulating learning environments that traditional spaces can’t support. Traditional educational environments do not offer the highly active and social interactive settings that will captivate and engage students in learning nor provide the collaborative environment that employers seek today (Bickford & Wright, 2006).
Purpose of Study

The purpose of this project was to identify principles of perception and visual cues of Gestalts psychology and implement these design concepts to the design layout of a community learning environment. The goal is to apply the findings from an extensive review of literature in designing a model for an engaging communal environment that supports, sensory stimulation, multidisciplinary, and highly interactive learning.

Justification of Study

Student’s perception and interpretation of the world is influenced by their environment, experiences, and memories. The various elements that are gathered are grouped into patterns to help provide an immediate perception (Lin, 2004). “The built environment can have a direct impact on motivation, concentration, and performance by affecting comfort, control, attention, access, and enjoyment” (Scott-Webber, Marini, & Abraham, 2000, p.18). According to Gestalt psychology there are six principles that can be applied to design (Lin, 2004). The first principle is Proximity - when elements are placed close together unity occurs and the shapes or patterns are now perceived as one group. The second principle is Similarity - which occurs when objects look similar to one another and are perceived as a group or pattern. The third principle is Continuity - which occurs when the eye is compelled to move through one object and continue to another object. The fourth principle is Common Fate – which occurs when elements move in the same direction and are perceived as a group or pattern. The fifth principle is Symmetry; – a priority in grouping given to naturally balance symmetrical figures over asymmetrical ones. The sixth principle is Closure - which occurs when an object is incomplete or a space is not completely enclosed. If enough of the shape is indicated, people perceive the whole by filling in the missing information.
In addition to the Gestalt principles, Visual cues which include color, lighting, space and function are also important for design (Lin, 2004). According to Scott (1993), designers and researchers are becoming increasingly aware that people’s attitudes, behaviors, and well-being are influenced by the aesthetic quality of their environment.

Color: color is one of the obvious visual cues in a physical environment. According to Eiseman (1998), color is a strong visual component of a physical setting, particularly in an interior setting. Research has shown that different colors stimulate varying personal moods and emotions (Lin, 2006).

Lighting: the type of lighting in an environment directly influences an individual's perception of the definition and quality of the space, influencing his or her awareness of physical, emotional, psychological, and spiritual aspects of the space (Lin, 2006). Researchers have found that participants perceived tasks more positively and reported decreased boredom in a room with windows, in contrast to a room without windows (Stone and Irvine, 1994). In addition, research on the influence of lighting level and room decor on interpersonal communication, comfort, and arousal indicated that general communication was more likely to occur in bright environments, whereas more intimate conversation occurred in softer light (Gifford, 1988). According to Fielding (2006), a broad spectrum of light and color is more consistent with a more holistic curriculum – one that takes into account a variety of learning styles and modalities. Environments in which lighting is designed to harmonize with furniture and accessories are perceived as more pleasant than environments in which lighting does not harmonize with other elements (Steffy, 1990).

Space and function: the furnishings in a physical environment link the space with its occupants and convey the personality of the physical environments through form, color, texture,
and pattern (Ching, 2007). The furniture placement may convey a sense of enclosure, define spatial movement, function as walls, and communicate visible or invisible boundaries. Recognizable changes in ceiling heights affect spatial perception more than a similar change in room width or length. High ceilings convey feelings of spaciousness, whereas low ceilings are associated with coziness and intimacy (Ching, 2007). All of these elements help individuals form a mental picture prior to affective response and judgments toward a specific physical environment (Lin, 2006).

This project explored the importance the use of Gestalts six principles of perception and visual cues in designing an effective and engaging learning environment for CSUN students and to merge all relevant literature in creating a model as a reference for design professionals, and educators to improve on learning environment designs for college and university students.

**Scope of Project**

The project was driven by the desire to address the many factors influencing the design of built environments and other learning spaces in educational settings for university students. The objective was to create a model for a learning environment using concepts of Gestalts psychology that would accommodate university students with an engaging and stimulating learning community that supports a multidisciplinary and highly interactive learning pedagogy. The design of the space includes modified floor plan and 3D renderings of informal gathering space, collaborative learning space, and a welcoming design element. Finally, the designed model will be assessed for its correlation with the literature review.
Definitions

1. **Built-environment** refers to human-made surroundings that provide the setting for human activity, ranging in scale from buildings and parks and cities. (Goodman, 2014).

2. **Collaboration** is working jointly with others or together especially in an intellectual endeavor (Meriam-Webster’s online dictionary).

3. **Comfort** occurs when there is a well-fit between a physical environment and its users (Obeidat & Al-Share, 2012).

4. **Community** is the social context of students and their environs. A group of people with a common purpose, shared values, and agreement on goals (Oblinger, 2006).

5. **Environment** is all the components within a physical spaced designed to affect the occupancy type and occupants (Graetz, 2006).

6. **Holistic** takes into account a variety of learning styles and modalities (Fielding, 2006).

7. **Learning Spaces** are flexible and networked; bringing together formal and informal activities in a seamless environment that acknowledges that learning can occur anyplace, at any time, in either physical or virtual space (Oblinger, 2006).

8. **Multidisciplinary** is the participation of several academic disciplines within a specific occupancy or interior built environment (Chism Van Note, 2006)

9. **Paradigm** a theory or a group of ideas about how something should be done, made, or thought (Meriam-Webster’s online dictionary).

10. **Built Pedagogy** the ability of space to define how one teaches (Oblinger, 2006).

11. **Sensory stimulation** raises mental awareness and allows people to absorb the information and ideas that the environment facilitates (Gee, 2006)
CHAPTER 2

Literature review

Imagine the space where you feel most stimulated, most motivated or most creative. What is it that produces those particular feelings? These are the questions that designers need to address as they transition away from the traditional educational designs (Bell, 2014). Evans & McCoy (1998) indicated that to attain a well-designed environment that fits well with human needs, it is important for designers to understand how a physical environment impacts its users. The built environment affects human behavior either negatively or positively (Sommer, 1969; Altman, 1970). Getting the end users involved early in the design process has the potential to affect education in a quantifiable way by designing components into facilities that encourage ownership and meet the changing needs of students and faculty (Bell, 2014).

“The more we imbed relevance in the school environment, the more likely students will be successful. Learners need space to collaborate, meet, and innovate, so every space should be designed to build upon this theme” (Bell, 2014, p.6). In relation to human well-being, designers should consider spatial conditions including color scheme, lighting, heating, cooling and ventilation (Yildirim & Cagatay, 2011).

Learning Community

Today’s students are highly social, connecting with friends, family, and faculty face-to-face and online, and prefer learning-by-doing rather than learning-by-listening and often choose to study in groups (Oblinger, 2006). Learning is a continuous process. We learn in quiet reflection, in noisy leaps, and in social interactions that arouse our emotions. A wonderful characteristic of learning is that we learn when we feel secure and comfortable, and also when we feel challenged. In fact, human beings are wired to learn—to make connections and to
recognize patterns in a wide variety of conditions. Pattern recognition and the ability to extrapolate concepts from information is a key attribute of success in the 21st century (Fielding, 2006). We need to understand the complexity of the human experience in order to understand what "learning" is about. Everything we do as designers impacts the users of the space at many different levels (Nair & Fielding, 2005).

Learning in a community environment is important for two reasons. The first reason is because, the use of societal resources provide better results when learning takes places in a community setting. According to Ewell (1997), evidence documenting the importance of community in learning is "overwhelmingly positive, with instances of effective practice ranging from within-class study groups to cross-curricular learning communities." Despite multiple theories about how people learn, they agree on one point: the critical role of interaction. In particular, social cognitive learning theory argues for a rich environment in which students and faculty share meaningful experiences that go beyond the one-way information flow characteristic of typical lectures in traditional classrooms (Bickford & Wright, 2006). Secondly, learning in community will have an important role in preparing students for their work-life to come. College graduates must succeed in professional environments that require interactions with other people. Companies call for graduates with different perspectives to collaborate across traditional disciplinary and business lines. In other words, community-centered education will help prepare graduates to live and work in a world that requires greater collaboration (Bickford & Wright, 2006).
Learning spaces

21st century students have attitudes, expectations, and constraints that differ from those of students even 10 years ago. Learning spaces often reflect the people and learning approach of the times, so spaces designed in 1956 are not likely to fit perfectly with students in 2006 (Oblinger, 2006). Therefore, learning spaces need to be carefully designed to be flexible and adaptable to new generations of learners and new methods of learning. The adequate design for education is no longer isolated, rigid and unchanging, instead learning spaces are adaptable and influenced by the community. Learning spaces are not mere containers for a few, approved activities; instead, they provide environments for people and should be designed to accommodate to factors such as the availability of food and drink, comfortable chairs, and furniture that supports a variety of learning activities that are emerging as critical in the design of learning spaces, giving consideration to human factors as integral to learning space design (Brown & Long, 2006).

Because of the socially interconnected nature of human beings and ubiquitous technology, learning spaces should be able to support 1) active and social learning strategies, 2) human centered design, and 3) provide devices that enrich learning. Space whether physical or virtual can have an impact on learning. It can bring people together; it can encourage exploration, collaboration, and discussion (Oblinger, 2006).

Informal learning spaces provide active and social interactive settings that support chance encounter, divergent conversations, and reflection and study about content presented in formal settings (Miller, 2005). The learning commons is human-centered. The term learning signals a significant change: the focus is not just finding information but applying that information in productive ways to deepen and strengthen learning as well as to construct knowledge. Learning, not information, is increasingly the focus. The move away from transmission to constructivist
learning and developments in technology has enabled this redefinition of the commons. If the constructivist model reflects how people learn, a more human-centered design of learning space is a positive change (Brown & Long, 2006).

The rapidly increasing accessibility of digital technology also has changed learning space design. More affordable and mobile technology facilitates greater access to content and resources. This enhanced access, in turn, has made it possible to implement a learning paradigm that emphasizes active learning, formative assessment, social engagement, mobility, and multiple paths through content. Although specific technologies may come and go, the enduring trend is technology becoming more capable, affordable, and mobile (Brown & Long, 2006).

Learning spaces in the 21st century need to nurture discovery, innovation, and learning. Understanding the needs of students and educators will help identify enablers of learning and teaching that will help in designing a successful human centered learning space. Social / academic interactions occur within the physical context of interior elements such as furniture, color, light, temperature, and space. In fact, surrounding elements may not merely create a pleasant atmosphere; they also facilitate a particular behavior and affect students’ performance and satisfaction (Bitner, 1992). For instance moveable seats will be more supportive for interaction therefore, may increase academic performance (Webber, 2000).
CHAPTER 3

Design concept

The proposed design includes a welcoming entrance and three learning spaces: Collaborative space, informal gathering space, and an individual learning space, located in the Extended Learning Center Building at California State University, Northridge. The design’s priority was to provide an aesthetically pleasant and engaging learning environment that would accommodate the organic nature of educational activities. Gestalts principles of perception and visual cues were used as tools in designing a learning environment that elicits positive emotional responses that not only enhances learning but also creates an emotional attachment to that space (Graetz, 2006).

The design process was divided into two steps. The first step was to implement Gestalts principles of perception into the space layout design to emphasize the role of the overall structure and the relationship between components in producing perceptual organization (Lin, 2004). The second step was to introduce visual cues into design to create a pleasant and exciting learning environment (Veltri, Banning, & Davies, 2006).

The Gestalt principles applied to the proposed design were proximity, similarity, and continuity. The location of the proposed learning spaces were intended to be within a close proximity to formal learning spaces to support chance encounters of value and social exchange (Acker & Miller, 2005). The principle of similarity was used in designing and determining location of learning spaces within the ELC. Each learning space is uniquely laid out and furnished for specific function. Individual learning spaces are private, quite spaces providing a seating area and or table a place for recollection. Informal gathering spaces are placed in-between formal and collaborative hubs furnished with benches, tables and chairs and intended for social interactions. Collaborative spaces are adjacent to formal spaces furnished with mobile
chairs, stools, and tables and intended for group collaboration. The design element that flows through the ELC provides senses of continuity. The design element that starts of at the main entrance locate on the east wing of the ELC and continues along the interior north wall and out into the courtyard of the west wing.

The visual cues that are most prominent in the design were color, lighting and space. Considering the fact that the east side of the building will be used as a gallery the prominent interior color is white. However, yellow has been used for the design elements throughout the interior and exterior spaces of the design. According to Gee (2006) Textures, colors, and shapes can reinforce association and retention.

Flexibility is a significant component in the design. Obeidat and Al-Share (2012) noted that lighting needs to be flexible as it is considered one of the most important features in a learning environment. The design takes advantage the natural lighting in both the interior and exterior spaces of the built environment. Informal gathering spaces have been laid out in the interior of the east building where natural lighting is made available through skylights. Collaborative and informal gathering spaces located in the west side of ELC exterior patio also make use of the available natural light. Individual learning spaces are illuminated with task specific lighting as to provide a more private and relaxed environment.

The space and function for each of the proposed learning spaces where defined by the location of space and placement of furnishings. Individual learning spaces
CHAPTER 4

Drawings of Proposed Learning Community

This chapter presents images of the proposed design of the learning community for the Tseng College new Extended Learning Center (ELC) at the California State University, Northridge. The project provided insight into trends and components that can affect spaces designed to accommodate multiple disciplines and advanced technologies. Images include perspective drawings, elevations, and floor plan. Images are scaled to fit page.

Figure 4.1. Existing Learning Center – Site Plan. Retrieved from http://csun.edu/facilities/extended-learning-university-building
Figure 4.2. Proposed design – Space plan

Figure 4.3. Site plan
Figure 4.4. Interior collaboration space

Figure 4.5. Exterior informal gathering space
Figure 4.6. Individual space

Figure 4.7. Exterior collaboration space
CHAPTER 5
Discussion of Project

The prototype learning community for the new Extended Learning Center (ELC) at California State University, Northridge (CSUN) implements theories of perception and visual cues to enhance social interactions and learning. Through a holistic perspective the design will produce a sense of community and create an engaging and stimulating learning environment for students to enhance collaboration, productivity and creativity.

Developing the design was challenging because of the ELC multiple disciplines and the broad range of student demographics. After determining the appropriate pedagogy design for the learning environment of the ELC the learning spaces were designed to be interconnected to provide the flexibility and accommodate to students multidisciplinary needs including individual learning spaces, collaborative learning spaces, and informal gathering spaces.

Based on the literature review, the selected concepts of Gestalt psychology such as principles of perception and visual cues were researched and applied to this project. The applications of Gestalts principles and visual cues were used to create engaging and stimulating design for a learning environment. Further examination of other Gestalt psychology concepts can be explored in designing and creating efficient layouts for learning environments. Further research or post-occupancy surveys are recommended to measure if prototype design of the community learning setting is facilitating student learning and student engagement. Material selections for this project are only prototypical and not based on literature review.
Conclusions

Educational built environments have remained relatively unchanged and use a teaching pedagogy intended for 20th century students and instructors. Technological advances have rendered traditional built environments unappealing and incapable of supporting social and active learning settings. Technology is becoming more affordable and ubiquitous creating higher user expectations for any physical and virtual space in both the educational and professional settings. The redesign of the ELC at California State University, Northridge will offer students an engaging and stimulating learning environment adaptable to a variety of learning styles, designed to encourage social and active interactions and allow students the ability to socially and academically interact in their physical environment (Altman & Chemers, 1980).
References


/dictionary/collaboration


