PEDAGOGY OF AESTHETICS:

A STUDY OF THREE ARCHITECTURAL DESIGN STUDIOS

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by

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A STUDY OF THREE ARCHITECTURAL DESIGN STUDIOS

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A candidate for the degree of doctor of philosophy,

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PEDAGOGY OF AESTHETICS:
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ABSTRACT

Venustas (beauty) in the architectural field is one of the qualities of architecture along with *firmitas* (firmness) and *utilitas* (utility). Given that pursuing beauty is one of the roles of an architect/designer, *aesthetics*, the discussion of beauty, cannot be excluded from architectural education. However, it is rare to find scholarly discussions that include aesthetic education and theory to explain the process of how students obtain knowledge of the aesthetics of architecture. This dissertation explores the pedagogy of aesthetic education in architectural design studios using a grounded theory approach. Based on a multicase study of three outstanding instructors' studios in three different schools, their 40 students and 3 administrators using observations, interviews and document reviews, a theoretical framework of "a process of aesthetic education in the architectural studio" is proposed. Finally, recommendations and implications for design educators are presented.

CHAPTER I

INTRODUCTION

Background

This study explores the pedagogy of aesthetic education in architectural design studios using a grounded theory approach. Aesthetic education in architectural design studios is not a common topic, as can be seen through a review of the literature. *Aesthetics* is also not a term frequently used in design studio discussion. Design instructors do not speak to their students by saying "the aesthetics of your design is . . ." or "your aesthetic view is . . ." However, even though the expression is not direct, people still look for aesthetics or aesthetic aspects of architecture in design projects. Designers pursue aesthetic aspects in their designs, and educators want to nurture those aspects in their students' learning. Whether there is a discussion about proportion, unity, harmony, contextual fit, or style, people pursue certain elements that can be called aesthetics. In architectural education, design studio is the venue where students produce design solutions while they consider the multifaceted aspects of design. Aesthetics is definitely one of those aspects.

In design studio, students learn about design through teacher-student interaction (Anthony, 1991; Ochsner, 2000). This is because the structure of design studio learning does not depend heavily on textbooks or concrete instructions. Rather, design studio learning depends on instructors' creativity on how to lead the course. The main avenue for delivering design knowledge in design studio is through discussions between teacher and students and the demonstration/criticism of the instructor regarding the students'

design outcomes. In addition, objective tools, such as exams or tests, cannot measure students' learning in design studio; rather, the students' learning outcomes are measured by the quality of their design projects. Therefore, the instructors' role in guiding and leading students' design development is highly significant in the student learning in the design studio course.

Aesthetics in architecture is understood as one of a triad of qualities identified by the Roman architect Vitruvius. He said good architecture consists of *firmitas* (firmness), *utilitas* (utility), and *venustas* (beauty) (Vitruvius, 10 B.C./1914). This means that good architecture needs to be sufficiently strong, to function well, and to be beautiful. Even though this definition is more than 2,000 years old, the three facets are still considered valid for understanding architecture and have been the basis for many textbooks and architectural curricula (Roth, 2007). Given that pursuing beauty is one of the goals of architects and designers, the discussion of beauty cannot be excluded from architectural education.

Despite its significance, aesthetics has been a difficult subject to discuss in relation to architecture and has generated much debate (Arnheim, 1977; Johnson, 1994; Lang, 1987; Roth, 2007). This is perhaps because the term *aesthetics* itself is a vague and obscure notion. Moreover, beauty, as aesthetics, involves subjective appreciation or judgment that depends on individual, cultural, and/or epochal differences. In addition, scholarly discussions about beauty generally originate in the field of aesthetics within the philosophy of art. Thus, the concept of aesthetics in architecture has not been easy to grasp, and there is even a tendency to avoid discussion of it (Johnson, 1994).

Furthermore, there is a strong holistic view that discussion limited to only the aesthetic facets of architecture is not meaningful because architecture is a type of art in which function cannot be separated from form (Lagueux, 2004). That is a reasonable view given the fact that architecture is a social and purposeful art (Hiller, 1996). Nevertheless, avoiding and/or ignoring discussions of the aesthetic aspects of architecture may cause us to overlook an opportunity to consider better methods for aesthetic education and pedagogic cues.

It is a common notion that education of aesthetic aspects lies within the realm of the individual instructor; thus, there is no in-depth discussion about how students and instructors understand that process (Johnson, 1994). However, given the definition of *pedagogy* as "the method and practice of teaching, especially as an academic subject or theoretical concept" (*Oxford Dictionary of English*, 2003), aesthetics can be a topic of rigorous study. Thus, in this dissertation, I consider *pedagogy* as a theoretical concept and discuss the method and practice of aesthetic education, teacher-student interaction, and the process of aesthetics. How, then, is the aesthetics of architecture taught in architectural education, specifically in the design studio? This is the first question of this dissertation.

When we look at design studios, sometimes we can observe that students under the tutelage of certain instructors tend to produce design projects of higher aesthetic qualities than those who learn from other instructors. How do such outstanding instructors teach students the aesthetic aspects of architecture? What teaching methods and strategies do they use for producing projects of higher aesthetic quality? Why do they use such methods, and what are the philosophies underlying the use of such methods?

These frame the second research question: What are the outstanding instructors' teaching methods and strategies regarding aesthetic education in their design studio?

In addition, the nature of the aesthetics of architecture that people perceive may be similar or different from those of other art categories such as sculpture, painting, and music. If so, how do instructors and students perceive the aesthetics of architectural design? What are the qualities people expect an aesthetically pleasing building design to have? This is the basis for the third research question: How do design studio instructors and students understand the current status of aesthetic education and perceive the aesthetics of architectural design?

Hence, this study is about the pedagogy of aesthetics and the process by which students learn about aesthetics in architectural studios. Through the grounded theory approach and data obtained by multiple methods—observations, interviews, and visual material reviews—this study intends to provide a theory that will explain the pedagogy of aesthetics and the process of aesthetic education.

A total of three design studios from three different Midwest universities were studied. Participants in this study were three design studio instructors, their students (40 in total), and three administrators (one departmental chair and two associate deans of the department/school) at the three universities. Three instructors were selected, based on the recommendations of the chair/associate dean of each department/school, as instructors who have the ability to guide students to generate design projects with high aesthetic quality, and who were recipients of teaching awards.

Observations were conducted overall once a week on a regular basis for one academic semester per studio. Interviews with instructors and students were conducted

twice and the interviews with the administrators were conducted once. In addition, visual materials from six students' project processes and products were analyzed.

Statement of Purpose and Research Questions

Thus, this research aims to understand the pedagogy of aesthetics in architectural design studio in depth and with a holistic view through a study of three outstanding instructors' studio teaching. There are three purposes of this study: (a) to identify pedagogy of aesthetics (including strategies and methods) of studio instructors; (b) to understand the two primary groups' (students and instructors) perspectives of current aesthetic education in design studios and aesthetics of architecture; and (c) to suggest a theory that can explain the process of aesthetic education in architectural design studios.

Accordingly, there were four research questions in this dissertation:

(a) How is aesthetics taught in architectural design studio?

(b) What are the three outstanding instructors' teaching methods and strategies regarding aesthetic education in design studio?

(c) How do design studio instructors and students understand the current status of aesthetic education and perceive the aesthetics of architecture?

(d) What is the process of aesthetic education in design studio and how do students experience such a process?

Significance of the Study

With the paucity of scholarly publications on the discussion of pedagogy of aesthetics, this study is significant in that it provides a rich description of the way aesthetics is taught by three outstanding design studio instructors. Because design studio is a core element of the architecture and interior design curriculum and the class where students spend the most time, it is important to understand design studio instructors' perspectives on aesthetics and their pedagogical methods for teaching the subject.

In addition, this study is important in that it explains the interactive process of aesthetic education through various channels: the voices of the students, the teachers, and the administrators as well as observations. Given the subjective nature of aesthetics, it is often considered a difficult issue for discussion. In a design review, it is easy to discern a reviewer's preference for a certain design; but, in many cases, in-depth discussion of the aesthetics of students' design is not common. By describing various voices, this study offers a holistic understanding of the process of aesthetic education in architecture; and, as a result, it may provide pedagogic implications to educators who want to improve their teaching in design studio.

Rationale for Using a Qualitative Research Method

Qualitative research "takes place in natural contexts" where "real-world situations are studied as they naturally unfold" (Bloomberg & Volpe, 2008, p. 14). The purpose of qualitative research is "to delve into the 'essence' of topic," and a researcher "seeks to discover and understand meaning of experience, acknowledges personal values, and

brings [his or her] own experience to bear on the study" (Bloomberg & Volpe, p. 13). In qualitative research, multiple methods are used to achieve triangulation.

Because the nature of education in design studio does not allow immediate responses or answers regarding the effects of teaching and learning, a researcher's presence in and observations of an instructor's class for a significant amount of time is required to fully describe how the instructor teaches the aesthetic aspects of architecture. Likewise, a long-term involvement in the research site (design studio) is necessary to identify strategies, tactics, and techniques that affect student learning and advancement.

Thus, research conducted over a length of time, involving ongoing observations and interviews with students and instructors, is necessary for us to deeply and broadly understand the phenomenon of aesthetic education. Conducting a qualitative study fits the research inquiry because the goal of this study is to understand the process and pedagogy of aesthetics embedded in architectural design studios.

Data were collected from multiple sources: observations, interviews, visual material, and document reviews. Three instructors' studios were studied; each instructor's design studio was observed once a week for one academic semester. The total data collection period was 1 year. Studio A data were collected in fall 2008, studio B data in spring 2009, and studio C data in summer 2009. Interviews of instructors, their students, and the chairperson or associate dean of each department/school were conducted. In addition, visual materials and documents regarding students' design processes and project products were collected and reviewed in order to better understand the situation where specific discussion occurred between the instructor and the students, as well as possible influence of instructor feedback on the students' design processes.

Theoretical Framework

Grounded theory was used as a theoretical framework for this research. A *grounded theory* is one "that is inductively derived from the study of the phenomenon it represents" (Strauss & Corbin, 1990, p. 23). This approach is "a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon" (Strauss & Corbin, p. 23). Grounded theory was first described in Glaser and Strauss' 1967 book, *The Discovery of Grounded Theory*. Instead of testing hypotheses, Glaser and Strauss introduced a research method developing theories grounded in data that emphasize "simultaneous involvement in data collection and analysis, constructing analytic codes and categories, using the constant comparative method" (Charmaz, 2006, p. 4). Because there is no theory to explain the pedagogy of aesthetics in architectural studio, I went to the research site (three design studios) without any hypotheses or assumptions. In order to inductively derive a theory grounded in the data in the field (design studios), data collection, data analysis, and coding and categorizing were conducted simultaneously in this study. Figure 1 shows the theoretical framework of this study.

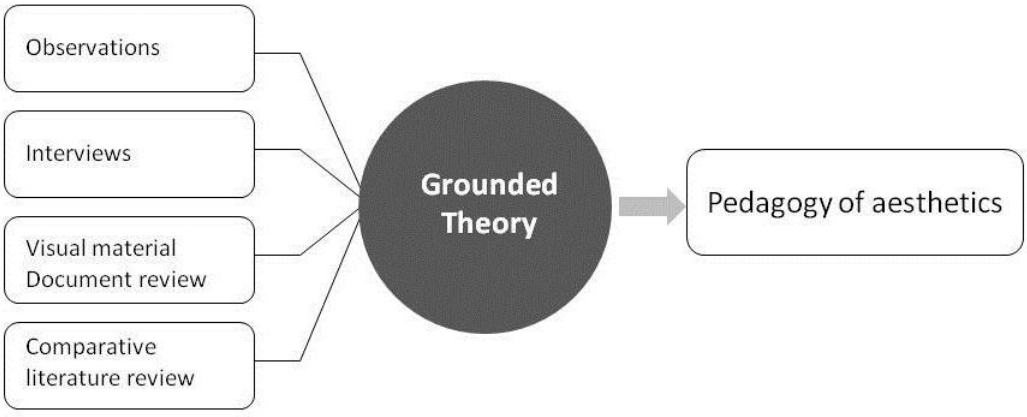

Figure 1. Theoretical framework of the research.

The use of grounded theory in this research is similar to the approach of Charmaz's (2006) *constructivist grounded theory*. Charmaz's symbolic interactionist point of view is that "grounded theory serves as a way to learn about the worlds we study and a method for developing theories to understand them" (p. 10). Researchers with a constructivist approach aim "to show the complexities of particular worlds, views, and actions" (Charmaz, p. 132). As a theoretical framework, grounded theory was used as a way to learn pedagogy of aesthetics, process of aesthetic education, and participants' perceptions of aesthetics in the design studio. Moreover, grounded theory served as a method for data collection and data analysis and for developing theories of pedagogy of aesthetics. My goal for this research is to show the complexities of aesthetic education in the various voices of participants in the process of aesthetic education—students, instructors, and administrators. Thus, the grounded theory used in this research takes an approach similar to that of Charmaz because I believe that one can construct a theory through involvement and interactions with participants and the context using empirical data.

Overview of the Dissertation

As illustrated in Figure 2, this dissertation proceeds along six steps.

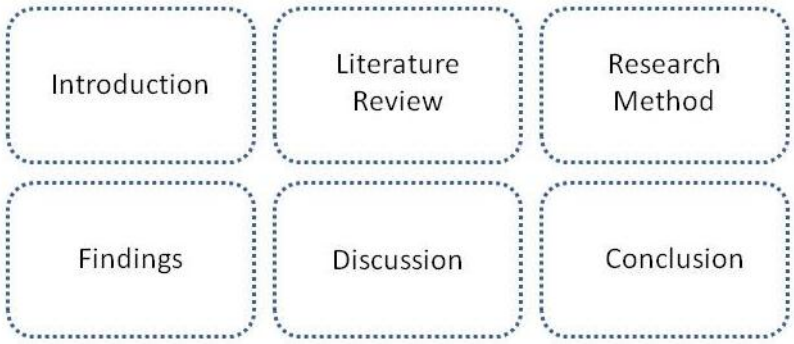

Figure 2. Overview of the dissertation.

Chapter 2 is a literature review that informs readers how various theories or discussions of aesthetics frame the aesthetics of architecture and where pedagogy of aesthetics is situated within the overall domain of aesthetics. The review comprises aesthetics in the fields of philosophy of art and environmental psychology, as well as architectural theory and research. Moreover, this chapter presents a survey of the nature of design studio and a brief history of architectural education in the United States with its emphasis on aesthetics. The chapter concludes with a proposed working definition of *aesthetics* in architecture for this study.

Chapter 3 discusses research methodology regarding data collection and analysis. This chapter explains in detail the method of interview, observation, and document/visual material review. The chapter also explains how grounded theory methods are used throughout the research.

Chapter 4 reports on findings from the data analysis through a coding process. This chapter consists of seven sections: (a) course structure in the three studios and participants' characteristics; (b) emphasis of studio projects in regard to aesthetics; (c) instructors' educational background and teaching philosophy of aesthetics; (d) customized aesthetic education observed through six student cases; (e) common themes of aesthetic education among the three instructors; (f) participants' perceptions of aesthetics and aesthetic education; and (g) student perspectives on their instructors' teaching methods in aesthetic education.

Chapter 5 presents an interpretation of the analysis and an in-depth discussion of the primary themes that emerge from data analysis. The themes are compared with other theories regarding education, pedagogy, aesthetics in philosophy and psychology, and

studio model education. In addition, a theoretical framework that explains a process of aesthetic education is suggested.

The final chapter presents the conclusion. Implications and recommendations for educators are suggested. In addition, the limitations of the study, future research direction, and my reflections on the research are discussed.

CHAPTER II

LITERATURE REVIEW

This chapter introduces the conceptual background of this dissertation by reviewing pertinent bodies of literature. These are (a) the meaning of the term *aesthetics*, (b) aesthetics as defining the nature of art in philosophy, (c) the cause-effect aspects of aesthetics in environmental psychology, (d) aesthetics in architectural theory and research, (e) the nature of design studio education, and (f) a brief historical survey of architectural education in the United States and its emphasis on aesthetics. At the end of the chapter, a loose definition of *aesthetics* in architecture is proposed.

The following diagram shows a summary of the literature review in this research.

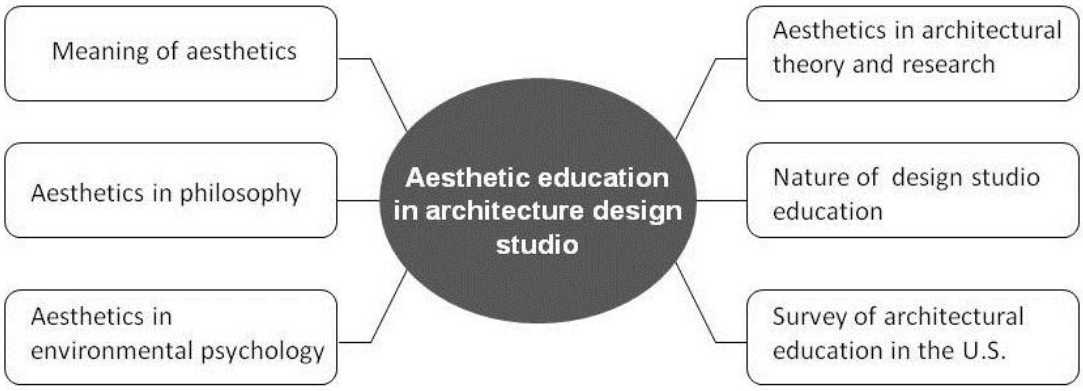

Figure 3. Conceptual background of the research.

Meaning of Aesthetics

The term *aesthetics* originated from the Greek word *aisthanesthai*, which means "to perceive" (Wartenberg, 2007, p. 6). In approximately 1750, the German philosopher Alexander Baumgarten redefined it to mean the study of good and bad perceptions (Wartenberg). However, it was through Immanuel Kant's influential work *Critique of Judgment* (1790/1951) that the term *aesthetics* came to occupy its dominant position in modern aesthetics (Townsend, 2001, p. 118). Even though interest in the interpretation of beauty has existed since ancient times, it was in the mid-18th century that aesthetics became an independent area known as the "philosophy of art" (Wartenberg, p. 6). The dictionary definition has two main meanings: "(a) a set of principles concerned with the nature and appreciation of beauty, especially in art; and (b) the branch of philosophy that deals with the principles of beauty and artistic taste" (*Oxford Dictionary of English*, 2003).

There is a shared agreement about two broad areas in which aesthetics has been actively discussed: philosophy and psychology (Lang, 1987; Lavie and Tractinsky, 2004; Scruton, 1979). Scruton argued that the primary concern of philosophy is in understanding concepts and nature of interest in art and architecture, whereas the primary concern of psychology is in identifying the nature of experience and causes of such experience (pp. 1-2). Lang (1987) explained the two approaches of aesthetic study as *speculative* and *empirical* aesthetics. Speculative aesthetics is the "study of aesthetic philosophies and the creative processes," and empirical aesthetics is "study of the process of perception, cognition, and attitude-formation" (Lang, p. 181). Lang's two aesthetics—

speculative aesthetics and empirical aesthetics—are somewhat philosophical and psychological in character.

Aesthetics in the Philosophy of Art

Within the discipline of philosophy, the primary position toward aesthetics was that of beauty and artwork (Townsend, 2001). Although discussion of aesthetics has changed according to the epochal period and culture, as well as the spirit of the period, one of the main theses of aesthetics is "What is art?" or in other words, "What is the nature of art?" (Wartenberg, 2007). Under this thesis, there are three primary subjects in philosophical aesthetics: the intention of art (how to define a work as art), the standard of taste (whether there is universality in aesthetic judgment), and the nature of aesthetic judgment (whether aesthetic judgment is a matter of taste or a cognitive function) (Wartenberg).

In terms of the first issue, *the intention of art*, some philosophers have argued it is the artist's intention that determines whether something is art (Collingwood, 1938/2007), whereas others have emphasized the importance of communication between audiences and artists rather than the artist's intention alone (Tolstoy, 1896/2007). Regarding standard of taste, there is an argument that a general principle exists (Kant, 1790/1951), whereas there is another argument that taste is subjective (Hume, 1757/2007). Concerning the nature of aesthetic judgment, there have been various arguments that it is an empirical experience (Hume), a pure intuition (Kant), and/or a cognitive function (Goodman, 1976).

In aesthetics regarded as a philosophy of art, architecture has not been a primary interest and has been rarely discussed (Lagueux, 1998). Instead, painting, poetry, literature, music, dance, and sculpture have been the major focal points. However, several significant philosophers from various eras, such as Kant, Hegel, and Goodman in the 18th, 19th, and 20th centuries, respectively, have discussed the nature of the aesthetic aspects of architecture.

To illustrate, in *Critique of Judgment* (1790/1951), Kant saw architecture as *formative art,* according to the form of representation, that expresses ideas by figures in space (p. 166). Kant also considered architecture as *dependent beauty* according to the existence of the purpose of art, saying that "the beauty of a building presupposes a concept of the purpose which determines what the thing is to be, and consequently a concept of its perfection; it is therefore adherent beauty" (p. 66). Kant explained that the reason a building with an oblique angle wall or pattern displeases people is that it contradicts the purpose of the building in terms of its use.

In *Introductory Lectures on Aesthetics* (1886/1993), Hegel divided art into three divisions based on the relationship between idea (content) and form: *symbolic art, classical art*, and *romantic art.* Hegel considered architecture to be *symbolic art* in which an idea is expressed in a certain form that is not completely harmonized. The relationship between idea and form of symbolic art is abstract. Hegel explained that the nature of symbolic art is "a mere search after plastic portrayal [rather] than a capacity of genuine representation" (p. 82). Symbolic art was the lowest stage of an idealistic hierarchy, and Hegel believed that tragedies and painting were at higher stages than architecture.

In *Languages of Art* (1976), Goodman argued that all works of art have symbolic properties. The symbolic properties consist of two fields: linguistic symbols (language) and nonlinguistic systems (pictorial, gestural, and diagrammatic); and he thought of architecture as an example of a nonlinguistic system. Moreover, Goodman divided art into two categories in terms of authenticity (original vs. forgery): *autographic art* and *allographic art*. An autographic art is one that "the distinction between original and forgery of it is significant," such as painting and etching (p. 113). In autographic art, "most exact duplication of it does not thereby count as genuine" (p. 113). In contrast, allographic art is one that history of production does not influence on the authenticity of artwork, such as music, dance, literature, and theater. To illustrate, if an orchestra plays a composer's music, that music is still appreciated as genuine; but when a painter exactly duplicates another artist's painting, that work will not be considered genuine art. Goodman saw architecture as a mixture of autographic and allographic art. It is allographic because any building built according to plans and specifications is judged "as original an instance of the work as any other" (p. 120); but, it is autographic because architecture's "notational language has not yet acquired full authority to divorce identity of work in all cases from particular production" (p. 221).

Although these philosophers discussed architecture, their interpretations showed that they focused primarily on the artistic nature of architecture. They tended to consider sculptural or monumental aspects of architecture from exterior rather than spatial aspects that people experience. In addition, they considered the static aspects of architecture only and did not consider an appreciation of beauty according to the observer's point of view

during movement. They did not show a holistic understanding of the aesthetics of architecture.

Five Major Approaches in Defining Art

In the philosophy of art, there are broadly five different perspectives toward how to define art: (a) representational theory, (b) expressionist theory, (c) formalist theory, (d) institutional theory, and (e) historical theory (Davies, 2006).

In brief, the *representational theory*, proposed by Plato, defines art as a representation of something. According to Plato, art is an imitation of a particular form: For example, a drawing of a chair is an imitation of an actual chair (Wartenberg, 2007). Thus, proponents of this approach believe that artwork has lower status than actual objects. Nonetheless, this theory has limitations in explaining abstract contemporary art collections that do not represent certain forms (Davies, 2006).

The *expressionist theory* explains that art elicits emotions from audiences, so the ability to communicate the emotions that the artist intended is a necessary characteristic of art. For example, Tolstoy (1896/2007) defined three emotions in art: reflection (emotions expressed by the artist), infection (emotions aroused in the audiences), and intention (emotions that the artist intend to elicit). Nevertheless, this theory also has a limitation in whether emotion is a defining quality of art because some visual art/industrial art does not necessarily arouse emotions but may still be considered art.

The third is *formalist theory* by Clive Bell (1914/1934). Proponents of this theory argue that a certain kind of formal structure is necessary for an object to become art. This theory leads to two distinctions: content versus form and semantics (what words constitute a sentence) versus syntax (how parts of a sentence are put together). Formalist

theory leads to the distinction between content (intrinsic) and formal (extrinsic) properties of art. It is a question of whether a certain form arouses a certain response in people. Bell introduced the term "*significant form"* as a quality which distinguishes artwork as eliciting an aesthetic response different from the responses to ordinary things. An example of significant form is the placement and relationship of formal elements such as line, color, and shape (Wartenberg, 2007).

The *institutional theory* explains that something is art only if it is an artifact and has a certain social property. Davis (2006) explained this theory: "An artwork is an artifact of a kind created by an artist to be presented to an artworld public" (p. 38). This approach is exemplified by Danto's *The Artworld* (1964). An *artworld* is an institution with an atmosphere of artistic theory like an art museum. This view considers that an artworld, a society, defines something as art. It raises the question of whether social context is a prerequisite for art making (Davis, 206; Wartenberg, 2007).

The *historical theory* of art states that *the intention to be art* makes something a work of art; in addition, something is art if it "stands in the appropriate historical relation to its artistic predecessors" (Davis, 2006, p. 39). To the proponents of this theory, artists' serious intentions and efforts to relate their work to established works of art in art history is the defining quality of *art* (Davis cites three studies by Carney, Carroll, and Levinson). However, this theory has its opponents because some revolutionary artworks that do not reflect past art legends are still regarded as art.

Even though the philosophers who advocated these five theories have attempted to explain how and what defines art, they refer more to the nature of art rather than to a clear definition of it. In regard to this phenomenon, Mandelbaum (1965) said that a

definition of art is impossible and suggested "family resemblances" as an open concept. *Family resemblance* is a term that refers to the indefinability of aesthetics. Art is not definable in the classical sense with necessity and sufficiency of structure; thus, art is an open concept (i.e., infinitely flexible without fixed and immutable boundaries). Mandelbaum argued that any object has two properties: a manifest property (surface) and a hidden property (context). Family resemblance expresses both properties; just as, in siblings we can observe similar appearances and biological commonalities. Art shares certain manifest properties and hidden properties, but it cannot be defined within definite boundaries. These five different approaches to definition of art show the difficulty and complexity in grasping the meaning of aesthetics.

Aesthetics, Beauty, Taste, and Morality

Aesthetics is an obscure and difficult concept to grasp; thus, philosophers have often used other terms to express aesthetics, such as *beauty* and *taste*. Kant (1790/1951) explained that "the beautiful is the disinterested object of delight in something discerned by taste" and "the form of finality in an object, apart from its end or purpose" (as cited in Johnson, 1994, p. 404). Kant defined *beauty* as "the expression of aesthetic ideas" (1790/1951, p. 165), and *taste* as "the faculty of judging of an object or a method of representing it by an entirely disinterested satisfaction or dissatisfaction" (p. 45). In short, according to Kant, beauty is the nature of an object that pleases people, and taste is the ability to experience that beauty.

Aesthetics is also discussed as a concept related to ethics. Ethics has broadly two meaning—morality and goodness. Hume (1742/1987), in *Of the Delicacy of Taste and Passion*, argued how aesthetic property is related to moral property. According to Hume,

the ethically reprehensible aspects of an artwork detract from its aesthetic value. If an artwork manifests a praiseworthy attitude, then it has additional aesthetic value. In contrast, there is another view that ethical issues of artwork are considered extrinsic to the artwork itself. Lagueux (2004) argued that even though the artist's moral issue is problematic, if the artwork contains aesthetic properties, it is assumed that the artwork should be praised for those properties. The artist's moral issue is in a different realm from his or her aesthetics. This is quite different in architecture because in architecture the ethical issue is intrinsic to architecture. If the building cannot meet the user's needs (in other words, if goodness is not fulfilled), that ethical issue cannot be separated from the value of the architecture itself (Lagueux, 2004).

To summarize, in philosophy, the main concern of aesthetics is how to define art. None of the previously mentioned approaches provide a perfect definition of art; however, the concept of family resemblance as an open concept somewhat explains the complex nature of art. Even though architecture has not been the primary concern of aesthetics, philosophers have discussed the artistic nature of architecture.

Aesthetics in Environmental Psychology

Another area that is useful for understanding the aesthetics of architecture is aesthetics in environmental psychology. In the 20th century, the active discussion of aesthetics occurred more within psychology than in philosophy (Townsend, 2001), and around 1970, environmental aesthetics came into existence in environmental psychology (Carlson, 2007). Environmental psychologists who explored the relationship between

environment and human responses/reactions played an important role in providing a backdrop for aesthetics in architecture (Carlson).

Whereas aesthetics in philosophy has primarily dealt with the nature of art and its relation to artists' intentions, audiences, and the artworld, aesthetics in environmental psychology focused more on cause-and-effect relationships between visual affects and human responses (Lang, 1987; Scruton, 1979). The interest of these scholars has been in cognition and the perceptual process of the aesthetic experience, as well as in finding properties that evoke feelings of pleasure (Lang). Thus, theories that developed from environmental psychology have attempted to explain the relationship between environment (i.e., architecture, buildings) and aesthetic feelings.

In the 20th century, there were two significant changes in aesthetics: (a) a reexamination of idealism that dominated the 19th century; and (b) the emergence of psychology (Townsend, 2001, p. 216). These changes meant that interest in aesthetics moved from the specific realm of artwork to the wider realm of everyday life. For instance, the empiricist John Dewey argued that aesthetics is the way people experience life in general, and art should not be conceived as a different endeavor from everyday living (Wartenberg, 2007, p. 137).

Aesthetics in environmental psychology is understood to belong to a broad category of psychological aesthetics in that it deals with causal relationships based on empiricism. However, it also shares many significant concepts with *analytic aesthetics* in philosophy (Fisher, 2000). Twentieth-century aesthetics is understood as the coexistence of continental aesthetics and analytic aesthetics. *Continental aesthetics* is the offspring of Hegel within European philosophy, whereas *analytic aesthetics* is a combination of

British and North American philosophies (Fisher). Analytic aesthetics has many ideas in common with psychological aesthetics because both are rooted in empiricism. Proponents of analytical aesthetics have interests in the definition, analysis, and science of aesthetics. In contrast, philosophers in continental aesthetics regarded consciousness as a priority and have developed their ideas through phenomenology and existentialism (Townsend, 2001, p. 277). Arguing that current architectural theory is excessively oriented toward continental aesthetics, Fisher has suggested that analytic aesthetics that deals with analysis of aesthetics should be more actively included in architectural education.

Gestalt Psychology

Researchers in environmental psychology have had a strong interest in Gestalt psychology using the empirical method that has played a significant role in explaining the theory of perception. Gestalt means a synergistic "whole effect" that is more than the sum of its parts (Behrens, 1998, p. 299). Proponents of Gestalt psychology believe that certain gestalts are innate, focusing on the relationship between "physical forces in the observed object and the psychical dynamics in the observer" (Arnheim, 1949, p. 160). They also assume that the experiencing of an object is "the product of a resonance between neurological processes and environmental patterns" (Lang, 1987, p. 191). In proposing hypotheses about visualizing and distinguishing patterns, they have offered a set of principles related to the perception of form, such as proximity, similarity, closure, good continuance, closeness, area, and symmetry (Lang).

Gestalt psychologists are considered to provide scientific foundations for principles of composition (Behrens, 1998, p. 301). They have suggested, "all our perceptions are organized into figures" and "patterns of lines, planes, and objects appear

to have a certain ‘dynamic’ quality” (Lang, 1987, p. 89). In the Gestalt law of visual organization, good figures have features such as conciseness, harmony, inclusiveness, regularity, simplicity, symmetry, and unity (Lang).

Theory of Affordance

Affordance, coined in Gibson’s (1979) *The Ecological Approach to Visual Perception*, refers to “the complementarity of the animal and the environment” (p. 127) and an action that an individual can potentially perform in his or her environment. In other words, “the affordances of anything, be it material or nonmaterial, are those of its properties that enable it to be used in a particular way by a particular species or an individual member of that species” (Lang, 1987, p. 81). According to Gibson, affordance results from the interaction between the environment and the person. The properties of affordance are physical, such as form or function, as well as symbolic meaning and aesthetic appreciations of it. Greeno (1994) explained affordance as referring to “whatever it is about the environment that contributes to the kind of interaction that occurs” (p. 338). Affordance provides not only information about the object, but also information about “what the possibilities are as far as human purposes are concerned” (Kaplan, 1979, p. 241). Lang said the concept of affordance plays a significant role in aesthetics because “different patterns of the built environment afford different behaviors and aesthetic experiences” (p. 81). Factors that influence a person’s perception of affordance are motivation, experience, values, and costs and rewards (Lang, p. 103). One environment can result in different affordances according to a person’s status.

Theory of Aesthetic Response and Quality Predictor

Given that the main interest in environmental aesthetics is the cause-and-effect relationship between environment and response, many researchers have sought such a relationship. Berlyne's *theory of aesthetic response* is one that explains the relation between arousal level and complexity of environment (Kaplan, 1987, p. 6). In addition, this theory explains the inverted-U shape relationship between preference level and complexity of environment, and a relationship between arousal level and perception of interestingness (Lang, p. 185). Berlyne found that pleasure increases to a certain level as complexity increases. He identified four stimuli (novelty, complexity, surprise, and ambiguity) as variables that generate arousal levels (Nasar, 1988, p. 261). His research showed that arousal levels change depending on an individual's interests and state, as well as the nature of objects.

Kaplan and Wendt's (1972) *quality predictor* proposed four aspects to measure preferences in environmental design: coherence, complexity, legibility, and mystery. Coherence comes from "symmetries, repeating elements and unifying textures that contribute to a 'good gestalt'" (Kaplan, 1987, p. 10). Complexity relates to "how much is "going on" in a particular scene, how much there is to look at," similar to diversity or richness (Kaplan, 1979, p. 243). Legibility concerns "the inference that being able to predict and to maintain orientation will be possible as one wanders more deeply into the scene" (Kaplan, 1987, p. 11). Mystery means "instances when the new information is not present, but is inferred from what is in the scene" (Kaplan, 1987, p. 9). Kaplan reported that the most preferred setting is a combination of informational and complex components. Between the two categories of predicting preference, coherence and

legibility relate to "understanding," and complexity and mystery relate to "exploration" (Kaplan, 1987, p. 9).

These two theories are considered influential aesthetic theories that impact a great deal of similar empirical research about the relationship between stimulus (i.e., complexity) and response (i.e., arousal) (Kaplan, 1987).

Aesthetics in Architectural Theory and Research

In the area of architecture, discussion of aesthetics has proceeded since the Roman period as an important element of architecture. Vitruvius defined beauty (*venustas*) as one of the essential qualities of architecture, along with firmness (*firmitas*) and utility (*utilitas*). According to Vitruvius, architecture should satisfy three requirements:

> These [public facilities] must be built in such a way as to take account of strength, utility, and beauty. The demands of *strength* [italics added] will be met when the foundations are sunk to bedrock, and the building, materials, whatever they are, are carefully chosen without trying to save money; those of *utility* [italics added] when the layout of the sites is faultless and does not make their use difficult, and when their arrangement is convenient and in each case suited to its particular situation; and those of *beauty* [italics added] when the work has an elegant and pleasing appearance and the relative proportions of the individual parts have been calculated with true symmetry. (Vitruvius, as cited in Kruft, 1994, pp. 24-25)

According to Kruft (1994), *firmitas* regards the area of construction, and materials; *utilitas* means the use of a building and its function; and *venustas* refers to aesthetic requirement or beauty, primarily proportion (p. 24). In the 17th century, Sir Henry Wotton paraphrased Vitruvius' *firmitas, utilitas, and venustas* into firmness, utility, and delight respectively (Pile, 2005). Alberti defined *beauty* as a wholeness of a

body, which is “a great and holy matter” (as cited in Johnson, 1994, p. 402). Lang (1987) stated that aesthetics is one of the fundamental goals of design.

The Latin *venustas* means beauty, and Vitruvius described it as follows: “the appearance of the work is pleasing and in good taste, and its members are in due proportion according to correct principles of symmetry” (as cited in Roth, 2007, p. 17). Even though this definition is still valid, contemporary architects may not accept the description of beauty by Vitruvius if they do not consider symmetry to be beautiful. Likewise, the meaning of beauty differs from era to era because it is influenced by the social notion of beauty in a particular time period.

The aesthetics of architecture differs from that of other types of art. Due to the unique characteristics of architecture, with artistic and practical purposes together, the discussion of beauty in architecture includes other considerations, such as practical and social functions (Hillier, 1996). As Lagueux mentioned, the function of architecture is “to create places and contexts in which social life goes on” (2004, p. 114). Lagueux argued that aesthetics cannot be a topic of separate discussion; it needs to be holistically understood with function and structure.

Many researchers have pointed out that the reasons for the lack of empirical research on aesthetics are the difficulty of measuring an individual’s preference for aesthetics, the complexity to trying to isolate factors that affect a person’s feelings for the whole building, as well as differing viewpoints on aesthetics (Arnheim, 1977; Lang, 1987; Lavie and Tractinsky, 2004; Michelis, 2007). However, Michelis has suggested two rationales for studying the aesthetics of architecture: first, it shows a principle of the

mind in aesthetic judgment, and second, it explains the meaning of architectural development, which is the purpose of the history of architecture.

Despite its significance, few publications have comprehensively discussed the aesthetics of architecture. Lang's *Creating Architectural Theory* (1987) is one of the books to survey a broad range of aesthetics in architecture. Lang put the discussion of aesthetics under the section of positive architectural theory. Positive theory refers to "a system of ideas or statements—a mental schema—that is believed to describe and explain a phenomenon or a group of phenomena" (Lang, p. 13). Positive theory is value-free and a concept opposite to normative theory. Normative theory is a statement of "prescription of action" (Lang, p. 13) and "what ought to be" (p. 16) that is value-laden. Lang's approach to aesthetics was based on scientific knowledge of the environment and a behaviorist point of view. He discussed aesthetics using the framework of Santayana's category of aesthetics.

Santayana is a 20th-century philosopher who provided an introduction of aesthetics in architectural theories. He distinguished among three values in aesthetics: *sensory values*, *formal values*, and *expressions* or *associational values*. Sensory values involve touch, smell, taste, sound, and sight; formal values entail the order of sensory materials; and expression or associative values refer to symbolic values, which include aesthetic, practical, and negative values (as cited in Lang, 1987, p. 182). Santayana stated that "a beautiful environment is one that gives pleasure to its beholder" (Lang, p. 182). His three categories were later defined by Lang as *sensory*, *formal*, and *symbolic aesthetics*. These three hold significance for architecture because they function as the

basis of the formal and symbolic meanings of the aesthetics of architecture (Johnson, 1994, p. 406)

Formal Aesthetics in Architecture

Formal aesthetics is concerned with "the appreciation of shapes and structures of the environment" (Lang, 1987, p. 180). The primary interests in formal aesthetics include the relationship between order and principle of visual structure and one's pleasure. In the book *The Dynamics of Architectural Form*, Arnheim (1977) discussed formal characteristics of architecture by showing aesthetically successful and unsuccessful buildings. He used both empirical and deductive logic based on Gestalt theory of perception in the analysis of building aesthetics. His research mainly focused on the perception and appreciation of two-dimensional patterns by insisting that order occurs when a specific principle controls the components of the whole composition. According to Arnheim, when there are many components and ordering principles, the structure becomes complex, but when no principle governs, disorder occurs. He argued that complex structures could embody order as well. In contrast to Arnheim, Venturi (1966) viewed *contradiction* and *disorder* as synonyms and thought they could provide visually richer environments than modern architecture (Lang). Arnheim stated that the more a pattern involves a high level of complexity, the more that pattern can be evaluated as pleasant.

Another issue in formal aesthetics is the relation between personal preference and the building's complexity. In a study of environmental complexity/simplicity and hedonic values, Rapoport (1977) argued that animals and humans prefer complex patterns in the visual field. He also argued that there is an optimum preference range of perceptual input,

and there are two ways of achieving complexity: one through ambiguity and another by varied and rich environments. Learning and level of experience are other factors that influence the perception of complexity (Lang, 1987).

The interrelationship of emotional response (e.g., pleasure and delight) and formal aesthetics also was studied in architectural field. Lang (1987) suggested that delight in the visual environment arises under the following conditions: the perception of the structure goes well with some principle of design; the perception of the structure fulfills its purpose well; and the individual's ability to adapt well to the degree of complexity/order. Clarity occurs when Gestalt principles are used in texture, color, inclination of surfaces, illumination, and shadowing (Gibson, 1966). Lynch (1960) proposed that when five facets of a city (i.e., paths, nodes, edges, landmarks, and districts) are clear, people can feel pleasure/delight in the city.

The other point that researchers focused on was individual differences in attitudes toward formal aesthetics. Examples of such studies are Eysenck's relationships between preference for a certain form and personalities of introverts and extroverts, Barron's degree of creativity, Rapoport's cultural influence, and Lawton's degree of people's competence to cope with a situation (all as cited in Lang, 1987). Nonetheless, there is no conclusive method with which to measure the relationship between an individual's pleasure and form or to explain individual preferences for certain formal aspects of buildings.

Symbolic Aesthetics in Architecture

Symbolic aesthetics deals with "the associational meaning of the patterns of the environment that give people pleasure" (Lang, 1987, p. 180). The concern of symbolic aesthetics in architecture is the meaning of architectural elements. As Lang (1987) said, architectural variables, such as a certain type of building configuration, spatial configuration, materials, nature of illumination, and color, convey certain meanings. To illustrate, a particular structural configuration brings to mind a particular building function such as government offices or an institution. In addition, there is a correlation between the size of a space and an individual's position within the hierarchy (e.g., a big office space indicates power). Materials also arouse the image of a special function for a particular building type. Factors that influence one's appreciation of symbolic aesthetics vary, such as social group (Rapoport, 1977), training (Groat & Canter, 1979), and personality. Arnheim argued that "the more firmly a traditional symbol attaches itself to an appropriate physical image, the more convincingly it survives changes in philosophy and doctrine" (1977, p. 208).

Groat and Canter's (1979) study of the meaning of modernism and postmodernism is an example of symbolic aesthetics. In their study of the communication of public building designs, they asked participants to sort 20 buildings according to preference for the design. The researchers found that despite postmodern critics' arguments that postmodern buildings resonate better with the laypersons than do modern building, they demonstrated that postmodern architecture was harder for the public to understand. This shows that a symbolic aesthetics may work differently between the laypersons and architect's groups.

Gap in Aesthetics Between Architects and Laypersons

Contrast in aesthetic preference between architects and laypersons has been studied in many areas, including architecture, landscape architecture, and urban studies (Devlin and Nasar, 1989; Gifford et al., 2002). Previous research has demonstrated that laypersons and architects communicate differently. For instance, in a study investigating people's impressions of buildings, Gifford et al. (2002) found that architects' perceptions were focused on building materials, whereas the laypersons' perceptions were focused on building forms such as roundness, ornamentation, and degree of articulation (p. 145). Moreover, overall evaluations of the buildings' aesthetics were different for the two groups.

Hershberger (1988) argued that architects need to focus on "what it is that makes non-architects fail to appreciate some 'potent' buildings that architects appreciate" and "try to determine which characteristics of buildings cause them to appear organized to laymen and pre-architects but not to architects, and vice versa" (pp. 192–193).

Another reason for the gap between architects and laypersons is the different emphasis on aesthetics between the two groups. Rapoport (1977) argued that, among Santayana's three types of aesthetics (sensory, formal, and symbolic), architects consider formal aesthetics more important, whereas the general public values the symbolic meaning of buildings and affordance rather than forms. Thus, recognizing how laypersons feel about and understand architecture, and how they value the environment, could be the one of the steps in closing the gap between architects and the general public.

Scruton's Aesthetics of Architecture

Scruton's (1979) *The Aesthetics of Architecture* is one of only a few books dedicated to the discussion of the nature of aesthetics of architecture. He discussed the topic using several social and philosophical theories such as those of Freud and Marx. The main argument of his book is the need to distinguish architectural aesthetics from architectural theory (p. 4). Scruton said architectural theory consists of attempts to "formulate the maxims, rules and precepts which govern, or ought to govern, the practice of the builder" (p.4) whereas architectural aesthetics is based on an understanding of the "capacity for experience and judgment" (p. 1). He considered architecture to be the most political art because "it imposes a vision of man and his aims independently of any personal agreement on the part of those who live with it [architecture]" (p. 15).

Scruton's (1979) discussion of aesthetics actually started as a reaction to the rationalism of modern architecture that argues for functionality and the social idealism that believes movements in architecture can change and save a society. The author argued that the most important feature of architecture is "its continuity with the decorative arts" (Scruton, p. 6). Scruton contended that classical architecture with decorations is aesthetically pleasing, and he regarded modernism as lacking aesthetics. He also said that the building façade is the area where architects should show their abilities in aesthetics. In the dearth of discussion concerning aesthetics in architecture, his work elevated architecture as a central topic of aesthetics. However, the discussion heavily centered only on classical architecture without extension to modern and contemporary architecture with a balanced perspective.

Lack of Discussion About Aesthetics in Architecture

The architectural theorist Paul-Alan Johnson (1994) mentioned that there is not much discussion, dialogue, or debate about aesthetics in architectural design even though aesthetics is one of the central issues of the field.

> The worry is that informed discussion of esthetics [sic] as an interpretive issue is now almost absent from professional architectural journals and from open public debate, even though it is warranted as a public concern of the highest order among architects, planners, fine arts commissions, and design review boards (Johnson, 1994, p. 402).

Johnson argued that the reason people avoid open discussion about aesthetics is because it would reveal their weak understanding of the topic, and in addition, environmental design involves many variables in form, size, color, and shape (p. 402). The inadequate level of discussion about aesthetics in architectural design is perplexing because aesthetics is central to the field, and students are expected to become sophisticated in their own aesthetic judgments.

Nature of Design Studio Education

Design studio is a course common to both architectural and interior design education. It is considered a core of the architectural design curriculum as students usually spend the most time in studio, and it is considered one of the most important courses for professional degrees (Anthony, 1991).

It is in design studio that students' design solutions actually occur, and the main knowledge gained is the result of discussion between instructor and students concerning those solutions. Although there have been some efforts to reconsider the culture of design studio by emphasizing architects' social roles and contributions to the community (Boyer

& Mitgang, 1996; Cuff, 1992), studio-based learning still remains at the center of architectural education.

Design Studio Environment and Design Review Process

The studio format in education provides a unique environment and has been studied by other disciplines in higher education (Boyer & Mitgang, 1996). It is counted as an alternative model for a learning environment, one that provides "a structured context for open-ended activity" and "interplay between autonomy and collaboration" (Shaffer, 2002, p. 198). Founded at the École des Beaux-Arts in France in 1863, design studio was originally a place where young architects were apprenticed to a master in an atelier (Shaffer). Demibas and Demirkan (2003) described design studio as the place where "the simulation of the real situation occurs" (p. 438). Ledewitz (1985) defined the role of design studio as a place where students learn new skills (such as visualization and representation), new languages (both graphic and verbal), and ways of architectural thinking.

There is no prescribed or defined structure in studio; the structure and content depend on the school and/or instructors and vary in terms of the number of projects, programming of projects, and use of textbooks. However, the general pattern is that students are given a design problem at the beginning of the semester, develop their design solution, and suggest an optimized solution as the outcome of the class (Graham, 2003).

The classroom environment of design studio is different from that of lecture courses. Each student has his or her own drafting table for an academic semester. Students usually post their drawings on the partitions near the table because they can use the table at any time during that semester. In many schools, drafting tables are accessible

after class hours, so students usually return to their seats and work on their projects outside of class hours. According to Bunch (1993), studio comprises the most credit hours, more than general education, electives, technology, history, or practice-related courses (pp. 116–119).

During the design process, the instructor gives criticism and feedback to each student based on the design stage and solutions, a private tutorial fit to each individual student. Students either accept or confront such criticism and then negotiate and develop their projects. The face-to-face criticism given at a student's desk is referred to as a *desk critique*. In the middle or at the end of semester, once students have generated certain design outcomes, the studio has design juries. *Design jury* is an event in which students present their design concepts, progress, and outcomes in front of the entire class, peer students, their instructor, and design reviewers (Anthony, 1991). Design reviewers usually consist of practicing architects/designers and other studio professors. The design jury is also called a *design review*, due to the negative connotation of the term *jury*. In design jury, students usually prepare and bring their models and drawings.

In many architecture schools, design studio classes are scheduled two or three times a week, lasting 4 or 5 hours a day, but often the class period exceeds that because one-on-one design review takes a long time. The number of students in one studio is usually around 10 to 20, smaller than a lecture course. Design projects in studio generally become more complex as students advance to the next grade (Ochsner, 2000).

The design review process in design studio usually occurs in two ways: through instructor feedback (desk critique) and by reviewer critique (design review). In many cases, students develop their projects individually. Interim or final design review occurs

several times per semester or per design project. Sometimes the design reviewers are professionals or instructors in other classes or studios. Because reviewers are not familiar with the students' projects and design processes and each presentation lasts only several minutes, there is often a misunderstanding of students' project intentions and goals.

Studio-Based Learning and Instructors in Design Studios

Architectural design is a creative activity in which students learn by doing, where "a designer comes to see and do things in new ways, no prior description of it can take the place of learning by doing" (Schön, 1987, p. 162). The interaction between the teacher and student is a rich source of knowledge in the studio (Cuff, 1992; Schön). Thus, it is worthwhile to understand the context of studio-based learning and the aesthetic aspects of design studio.

As a core of the architectural curriculum, design studio encompasses many aspects of the nature of design, such as psychological, social, cultural, functional, and aesthetic issues (Bhatia, 2006; Findeli, 2001). Bhatia summarized three main considerations in design studio discussions: functional, psychological, and sociocultural. The functional consideration lies in meeting the programming, function, economic efficiency, and purpose of the architecture. The psychological consideration includes aesthetics, architectural experience, and sensory perception (Bhatia, p. 15). The teaching of psychological aspects helps students develop the insight to analyze and interact with building occupants' psychologies and behaviors in an environment (Hill, 1999). The sociocultural consideration encompasses understanding of the social and cultural values of the society.

Architectural design studio is where students synthesize what they have learned from other courses. According to Demirbas and Demirkan (2003), architectural education generally comprises four categories: (a) fundamental courses that focus on expanding the student's design knowledge; (b) technology-based courses that teach the scientific features of architecture; (c) art-based courses that develop expressive skills; and finally, (d) design courses that integrate the three previous categories. Design studios are representative of the design courses. Within this educational context, design studio is a venue where students holistically express their ideas by synthesizing what they have learned from other courses, such as design fundamentals, technology-based, and art-based classes.

Courses related to aesthetics have either a direct or an indirect format. The direct format refers to those courses in which the primary concern is discussion of design principles such as proportion, composition, color, harmony, visual weight, and factors of aesthetics. Design fundamentals, visual design, and/or drafting courses can belong to this category. The indirect format refers to courses in which the primary concern is not aesthetics alone, but students can learn indirectly and acquire knowledge to discern beauty, such as through precedent architecture. Design studios or history courses can represent this format. Even though the names of classes differ from school to school, course structures tend to be similar because associations of architecture schools (e.g., NAAB) frame the overall criteria for student performance (Bunch, 1993).

Lack of Discussion About Studio Teaching

There is little research on teachers and their pedagogical approaches to design studio, and this may be due to the complexity of studying pedagogy with rigorous research procedures. It is difficult because the study of pedagogy begins with the study of individual teachers; thus, it takes a long time to understand the interaction between the instructor and students. Furthermore, the researcher must be in the educational context to determine any cause-effect relationships. Finally, study of the design studio process involves many elements, such as students and instructors with various characteristics and approaches to design. Thus, observation alone cannot fully reveal the design process. Interview (reflection of the past process), protocol analysis, drawing analysis, and behavioral and representational observations contribute to an interpretation of the design process. Likewise, study of the design process and design education is difficult and complex (Zeisel, 2006).

The absence of discussion about studio instruction and the relative lack of scholarly reports in the architecture literature has been discussed by Ochsner (2000), Attoe and Mugerauer (1991), and Moore (2001). Ochsner (2000) noted that there is complete silence on the character of the interaction between students and faculty that would contribute to enhancing students' learning of design. He wrote, "As they [faculty] begin to teach in design studio, the assumption seems to be that they will go through a process of 'learning by doing' and everything will work out" (p. 194). He pointed out that many instructors begin teaching without any training or preparation regarding instruction and rely mostly on their own experience as students. Ochsner asked the following questions:

> (1) Are the only pedagogical models that faculty have for design studio those that they experienced as students? (2) Are these models adequate to carry faculty in what may be thirty or even forty years of design studio teaching? (3) Is there really no other source of information that might help in considering what takes place in the design studio interaction between faculty and student? (p. 194)

Attoe and Mugerauer (1991) in "Excellent Studio Teaching in Architecture" also pointed out that studio instructors receive no training for teaching; instead, they rely on their intuition and what they previously learned as students in design studios. Moore (2001), in "The Scientist, the Social Activist, the Practitioner and the Cleric: Pedagogical Exploration Towards a Pedagogy of Practice," argued that "pedagogical discussion is not very common in schools of architecture . . . they teach in the manner in which they were taught—a self-perpetuating proposition" (p. 60).

In *Design Juries on Trial,* Anthony (1991) pointed out that faculty and visiting critics do not receive any formal training in how to conduct juries. Instead, they rely on their own techniques, modeled after those professors used when they were students (p. 54). From her rigorous survey and interviews, Anthony highlighted students' voices in design studio. Many students complained that design reviewers do not provide the rationale for their judgments; instead, their focus was only on their preferences (i.e., likes and dislikes). She revealed that students want to hear the reasons for such criticisms in detail so that they can learn and improve their designs.

The Nature of Design Process

The architectural design process is difficult to describe because each person may approach design differently. Some students may quickly decide upon a design direction and spend more time in developing an idea, whereas other students may spend a long time deciding their design direction, testing ideas many times until they find a satisfying

one. Some may be good at sketching or making models to test their ideas, whereas others may be hesitant to do that until they have a clear idea in mind. Zeisel (2006) said describing the design process is difficult because it involves "so many intangible elements such as intuition, imagination, and creativity" (p. 19). Schön (1987) described designing as a process that involves complexity and synthesis (p. 41).

Many researchers have tried to define the design process. Zeisel (2006) said it is a spiral process of imagining, presenting, and testing cycles. He pointed out that the design process is so complex that researchers cannot understand anyone's design process perfectly. He also argued that due to that, research evidence of the design process is "indirect and inferential or introspective" (p. 21). Even though researchers observe someone's design process by observing his or her behavior and generated design drawings (behavioral and representational observation), they are parts of designing and we cannot directly observe the brain activity itself (Zeisel). Thus, in design study, it is inevitable to collect data from multiple sources to infer a designer's mental processes and perspectives and to describe the whole process from partial evidence (p. 21). Likewise, the study of aesthetic education in design studio presents complex challenges because the effects of aesthetic education are supported by the evidences (e.g., drawings, sketches, renderings) that result from the design process.

The architectural design process usually goes through the following stages as a cyclic sequence: analysis of site or problem → conceptual design → development of the idea → presentation of the idea using drawings, modelings, or renderings. In practice, architectural design conventionally is broken down into the following stages: programming → schematic design → preliminary design → working document →

construction (Salvadori, as cited in Lang, 1987, p. 39). Assessment of design quality usually occurs during the design process and through the production of different design stages, from the conceptual phase to the final presentation of work. According to Cowdroy and de Graaff (2005, p. 508), assessment of creativity occurs in three hierarchical stages of design: (a) conceptualization, (b) schematization (development of schema), and (c) execution.

Architectural design is considered an art on the one hand and a science on the other, and there has been debate as to whether the design process is based on intuition or reason. Within the approaches that see design as problem solving, Lang (1987) introduced three different perspectives of the nature of design: design as intuition, design as reason, and design as an argumentative process (p. 37). Proponents of *design as intuition*, such as Broadbent and Osborn, did not develop their views further because they assumed that design is intuitive and beyond measurement. Jones described researchers in this group as "black-box designer[s]" who see design as a mysterious process (as cited in Zeisel, 2006, p. 23). The perspective of *design as reason* became prominent and advanced significantly as "design methodology" in the 1970s and 1980s.

Regarding the design methodology research streams, Rittel (1973) designated those researchers who considered design as reason to be the *first generation*, and those who viewed design as argumentation to be the *second generation*. The first generation saw design as incorporating systematic methods of problem solving borrowed from computer techniques and management theory (Cross, 2007). The common characteristic of this generation is they did not deal with the real ability of human beings in environments; instead, they suggested mathematical algorithms which were too machine-

oriented (Cross, 2007; Dorst and Dijkhuis, 1995; Lang, 1987). Alexander's (1964) analysis and synthesis model, Archer's (1970) analysis, synthesis, and execution model, and Jones' (1970) serial sequential model belong to this design-as-reason generation (Lang, 1987; Zeisel, 2006).

The second generation pitted themselves against the first generation, arguing that design is not a strictly sequential process. This group was influenced largely by Rittel and Webber's (1973) definition of *design* as "a wicked problem." A wicked problem is distinct from a science that deals with tamed or well-defined problems. It has no definitive formulation, no rule in regard to when to finish, no operative method to solve the problem, and no right or wrong answer (Lang, 1987, p. 43). Zeisel's (2006) design as spiral process belongs to this group. This generation focused on satisfactory and appropriate solutions rather than any single, optimized solution and saw designers as working in an argumentative or participatory process. This approach acknowledged the design process as a cyclic one, but was similar to the first generation in that it still considered design as a problem to be solved.

In contrast to the first and second generations' views of design as problem solving, Schön (1983) suggested a new perspective by proposing *reflection-in-action*, which views the design process as a "reflective conversation with the materials of a design situation" (Schön, 1992, p. 3). Schön focused on how professionals think and act in their practices. *Reflection-in-action* means a process of thinking of "what we are doing while we are doing it" (Schön, 1987, p. 26). He saw that each design is a unique problem and designers actively set and frame the problems. Schön's approach is interpreted as a

constructionist approach that differentiates it from the problem-solving view of the positivist approach (Dorst & Dijkhuis, 1995).

According to Schön's (1987) perspective, the relationship and interaction among teacher and students are rich sources of knowledge because the main knowledge gained is the result of their interaction concerning the students' design solutions. The studio process is a venue for reflection-in-action as a place of telling, listening, demonstrating, and imitating. Schön interpreted reflection-in-action as the ability a teacher must have as an architecture educator and as a practitioner. Thus, the quality of studio depends on an instructor's capacity to create an environment where active interaction can take place (Ochsner, 2000, p. 203).

Schön (1987) explained that teaching of professional practice is based on the interconnection of thought and action. The instructor's reflection-in-action during the design process interacts with students, delivers knowledge, offers feedback, and influences students' learning (Schön). Aesthetics of architectural design is one aspect of such feedback and knowledge delivered from those processes.

Schön (1987) also pointed out the complexity of studio teaching. He argued that professional knowledge should not be based on technical rationality, which derives from positive philosophy. He argued that "these indeterminate zones of practice-uncertainty, uniqueness, and value conflict escape the canons of technical rationality" (p. 6). Schön criticized Simon's view of design as instrumental problem solving, stating that it is a process of optimization and that this view overlooked "the most important functions of designing in situations of uncertainty, uniqueness, and conflict" (p. 41). Seeing the design

process as reflection-in-action was quite different from the framework of the first and second generations that viewed problem solving as technical rationality (Reffat, 2006).

Brief History of Architectural Education in the United States and Its Emphasis on Aesthetics

The current architectural education system in the United States has been influenced by several major design schools in Europe (Boyer & Mitgang, 1996; Weatherhead, 1941). Thus, in order to understand the basis of aesthetic education in the architecture curriculum, it is beneficial to review the history of architectural education in the United States and its emphasis on aesthetics.

École des Beaux-Arts

Design studio in the United States has its roots in the École des Beaux-Arts of Paris, which still influences contemporary architectural education (Boyer & Mitgang, 1996, p. 15). Before the mid-19th century, the education of architects occurred in the company of practicing architects; it was in the mid-19th century that campus-based education began (Boyer & Mitgang, p. 14). The Beaux-Arts philosophy emphasized the aesthetic aspects of architecture by placing design aspects above technical ones, and by valuing learning from precedence. To illustrate, drawing beautiful renditions of classical orders and ornaments was a significant part of learning.

The representative spirits of the École des Beaux-Arts were freedom, competition, and various assignments and ateliers (Carlhian, 1979). The Beaux-Arts classes were rigid in course type and content, as well as number and kinds of exercises. However, students had freedom in entrance eligibility (no academic prerequisite) and in selecting their

design teacher and the order and sequence of the course (Carlhian, p. 7). Students were allowed to receive some help from older students, and their work was evaluated through design juries (Carlhian, 1979). According to Weatherhead (1946), students learned "first, by the constructive criticism of the student's own efforts, and second, by the inspiring example of the master as he created for the student a suggested solution to a problem with which the student had struggled" (p. 156). Another characteristic of the Beaux-Arts establishment was a competitive spirit. A basic goal of the Beaux-Arts approach was to make competition an "exciting and rewarding pursuit" (Carlhian, p. 7).

The Beaux-Arts atelier, which corresponds to design studio, consisted of 50 to 100 students, from novice to elder students. Because the atelier master (similar to the studio instructor) visited the atelier weekly and gave design problems, elder students often helped novices by interpreting the master's words and giving advice. As an exchange, novices helped elder students by doing menial tasks (Carlhian, 1979, p. 7). Actually, before being accepted to the Beaux-Arts academy, students had to join the atelier to prepare for the entrance exam, which consisted of architectural design, drawing of decoration, and an exam in a scientific field (p. 8). Once accepted to the Beaux-Arts academy, students took a course in architectural design and a set of scientific/construction courses.

Each year students participated in a design competition consisting of an initial sketch (*esquisse*) and a drawn project (*projet rendu*) (Carlhian, 1979, p. 10). *Esquisse* was a sketch project that students had to generate within 12 hours without anyone's help so that it would show their originality (p. 10). *Projet rendu* was a project in which

students developed their *esquisse* concept in six weeks. The most important component in *projet rendu* was a floor plan drawn in enlarged scale (p. 13).

History of architecture was an important lecture and the Beaux-Arts academy valued learning from history. Carlhian, who studied at the Beaux-Arts, said that "history was in fact part and parcel of their daily life," (Carlhian, 1979, p. 15) and reflected that "by forcing him to actually make use of past historical elements as basic components of his own composition, it developed in the student not only a familiarity with, but an attitude towards history which was going to stay with him for life" (p. 8).

The Beaux-Arts academy prioritized learning aesthetics through history over other aspects and did not focus much on the technical aspects of architecture. This is related to the French school system because there were separate engineering and technical schools, such as the École Polytechnique. Architects in the Beaux-Arts period were to be the "master designer and the master renderer who specified buildings abstractly on paper" (Salama, 1995, p. 41).

The Bauhaus—Modern Period

The Bauhaus is another design institution that tremendously influenced Western architectural education as well as the current culture of design studio. The impact was especially prominent in the United States because many professors of the Bauhaus fled Weimar in Germany to avoid the Nazis and became professors in large and famous schools. Developed in 1911 in Weimar, Germany, by German architect Walter Gropius, the Bauhaus aimed to combine arts and crafts in one place for the production of architecture (Broadbent, 1995). Gropius' goal was that "the craft should be well established before the architecture course was started" (Broadbent, p. 17).

The Bauhaus rejected the style of the École des Beaux-Arts in several ways: They did not teach history of architecture; workshop was a significant curricular component; and they embraced the spirit of invention for mass production by the use of machines (Salama, 1995). According to Salama, the establishment of the Bauhaus was a result of economic demand during the postindustrial era. After industrialization, there was a big push for product development for mass production. Moreover, until the middle of the nineteenth century, there was a notion that the fine arts were superior to crafts. The Bauhaus aimed to equalize art and craft. The slogan coined by Gropius was "art and technique as a new unity" (Weatherhead, 1941, p. 179).

The curriculum had three divisions. First was the preparatory course (e.g., classes in form and composition, practical workshop training); second, a technical instruction course (e.g., workshop training, design of spaces and surfaces, model building training, lectures in building construction); and third, the final course in architecture and construction (e.g., architectural design studio, lectures on steel and reinforced concrete construction) (Salama, 1995, p. 54; Weatherhead, 1941, pp. 181-182). Studio belonged to the last stage of architectural training and only small numbers of qualified apprentices were able to participate. Students who finished the technical instruction course received a Journeyman Certificate and those who finished the final course in architecture and construction received the Bauhaus Certificate (Salama, p. 54).

The Bauhaus was based on the spirit of modern technology and mass production, dominated by Gropius' pedagogy (Anthony, 1991, p. 10). Gropius refused to teach history or precedence because he believed that they did not nurture aesthetic ability. Instead, he introduced rigorous studies of perception, aesthetics of color and composition,

and Gestalt theories (Lang, 1987, p. 26). The Bauhaus provided a relatively more systematic way of teaching aesthetics compared with present architectural education (Lang).

After moving from Weimar (1919-1924) to Dessau (1925-1931) and then to Berlin (1932-1933), the Bauhaus closed in 1933. After the closing, many educators in the Bauhaus moved to the United States and eventually led architecture schools: Gropius and Marcel Breuer at Harvard University, Mies van der Rohe at Illinois Institute of Technology, and Joseph Albers at Black Mountain College at North Carolina (Salama, 1995). The idea of the Bauhaus, "craftsmanship, aesthetic logic, appreciation of the properties of materials, and an aesthetic that derived from the exploration of geometric forms," became a foundation of U.S. architectural education (Boyer & Mitgang, 1996, pp. 16–17). The basic principle was "that design is neither an intellectual nor a material affair, but simply an integral part of the stuff of life" (Weatherhead, 1941, p. 181).

According to Findeli (2001), compared with the Bauhaus, current architectural education focuses too much on science and technology and thus has lost its emphasis on art. Findeli assessed that the Bauhaus was based on an art-technology polar structure. Many courses were taught by artists such as Wassily Kandinsky, Paul Klee, and Joseph Albers; design was considered as "artistic or esthetic theory applied to practice" (p. 9). In addition, the Bauhaus School considered fine art and crafts to be variants of the same thing, and color, form, composition and painting were rigorously taught as fundamental aesthetics (Salama, 1995).

Modernism and Postmodernism in Architecture

Modernism in architecture refers to the modern movement in architecture. Its origin depends on how we see modernism itself, but one of the views is that the modernism started in the early twentieth century (Leach, 1997, p. 3). The spirit of modernism was closely related to many schools of art thought in Europe, such as the De Stijl group of Holland, Cubists of France, the Rationalist and Constructivist schools of thought in the Soviet Union, and the Bauhaus in Weimar Germany (Lang, 1987). Later, this spirit influenced the thought and the work of architects in the U.S., such as Louis Sullivan's "Forms follow function," and Frank Lloyd Wright's "Form and function are one." In Europe, Mies van der Rohe's "Less is more," and "Le Corbusier's "Machine for living" were famous manifestos in modern architecture (as cited in Lang, p. 3-4).

Modernism started from the social concerns in the early twentieth century, such as bringing people to a higher standard of living by the use of advanced technology and mass production. Proponents of modernism preferred aesthetics in abstract expression, pure geometric form, and rejected use of decoration.

Postmodernism in architecture refers to a movement that started in the 1960s and was influential until the early 1990s. It started as a counter reaction to modernism. Challenging the ideology of modernism, proponents of postmodernism criticized modern abstraction, alienation of people from architecture, disrespect for past established values, and the functionalist approach in Modernism in architecture. Graves argued that the modern movement undermined poetic form by use of geometric and abstract form, and argued "poetic forms in architecture are sensitive to figurative, associative, and anthropomorphic attitudes of a culture" (1996, p. 86).

Postmodernists argued the primary essence of architecture should move from function to form. They valued use of historic decorative traditions, historic eclecticism; and they emphasized symbolic aesthetics of buildings, low culture, and vernacular architecture (Nesbitt, 1996). Venturi advocated "the importance of looking at and using architectural history in contemporary design" (as cited in Nesbitt, 1996, p. 25). However, postmodernism was a counter reaction to modernism and did not create its own constructive principles.

Establishment of Associations

With the establishment of the Association of Collegiate Schools of Architecture (ACSA) in 1912, the National Council of Architectural Registration Boards (NCARB) in 1919, and the National Architectural Accrediting Board (NAAB) in 1940, architectural education evolved into a more firmly established discipline (Bunch, 1993). The NAAB is an organization that accredits architecture schools' baccalaureate, master's, and doctoral degree programs. Among the accreditation criteria is the *Student Performance Criteria*, a list of the capabilities the NAAB expects to student to have. Thus, those criteria tend to frame the overall curriculum of architectural education. The goal of these performance criteria is "to help accredited degree programs prepare students for the profession while encouraging educational practices suited to the individual degree program" (NAAB, 2009, p. 21).

The Council of Interior Design Accreditation (CIDA) is a similar type of organization with regard to interior design education. The CIDA outlines *Professional Standards* as accreditation criteria. This document contains expectations of students and programs and expected learning levels. Given that one of the participant schools in this

study is accredited by the CIDA, it is helpful to review both NAAB and CIDA guidelines in order to understand curriculum ranges related to aesthetics. Both organizations update accreditation criteria every few years in order to meet societal needs and demands.

For example, NAAB's *Student Performance Criteria* (2009) consists of three realms that comprise 31 criteria. The three realms are (a) Realm A: critical thinking and representation; (b) Realm B: integrated building practices, technical skills, and knowledge; and (c) Realm C: leadership and practice. Within the 31 criteria, the term *aesthetics* occurs twice:

> B. 10. Building Envelope Systems: *Understanding* of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, *aesthetics* [italics added], moisture transfer, durability, and energy and material resources.
> C. 6. Leadership: *Understanding* of the techniques and skills architects use to work collaboratively in the building design and construction process and on environmental, social, and *aesthetic* [italics added] issues in their communities. (NAAB, 2009, pp. 24-25)

Aesthetics is not mentioned as much as technical aspects, perhaps because aesthetics is not easily measurable and thus would complicate the evaluation of a school's performance. However, even without direct use of the term, aesthetics seem integrated in the following criteria:

> A. 6. Fundamental Design Skills: *Ability to* effectively use basic architectural and environmental principles in design.
> A. 7. Use of Precedents: *Ability* to examine and comprehend the fundamental principles present in relevant precedents and to make choices regarding the incorporation of such principles into architecture and urban design projects.
> A. 8. Ordering Systems Skills: *Understanding* of the fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three-dimensional design. (NAAB, 2009, p. 22)

CIDA's (2009) *Professional Standards* consists of four sections and 15 standards. Two sections are related to student performance expectations: (a) Section II: Interior design: critical thinking, professional values, and processes; and (b) Section III: Design: core design and technical knowledge. Section II describes "the framework of interior design practice" and section III describes "the historical, theoretical, and technical contents of interior design practice" (CIDA, 2009 II-7). The term *aesthetics* occurs in standard 10:

> Standard 10. Color and Light
> . . . Student Learning Expectations
> Student work demonstrates *understanding* of:
> a) color principles, theories, and systems.
> b) the interaction of light and color and the impact they have on one another and interior environments.
> Students:
> c) appropriately select and *apply* color with regard to its *multiple purposes* [italics added].
> d) *apply* color effectively in all aspects of visual communication (presentations, models, etc.) (CIDA, 2009, II-17).

As an example of multiple purposes, aesthetics is listed in a footnote along with functional, behavioral, perceptual, cultural, and economic elements. In other standards, such as 4 (Design Process) and 9 (Space and Form), aesthetic aspects such as ordering principles are listed as expected criteria—again not in explicit form.

Summary of Literature Review and Working Definition of *Aesthetics*

In summary, literature review suggests the following conceptual background of this study:

a) In studying the pedagogy of aesthetics, it is helpful to explore two main areas: philosophy, to identify the defining nature of aesthetics and the relationship between

aesthetics and ethics, and psychology, to explain the cause and effect of aesthetic response and perception;

b) Lang's (1987) two categories of aesthetics—formal and symbolic aesthetics, as developed from Santayana—function as a skeleton to understand the two primary natures of aesthetics. It involves form and it involves people to use/view/experience the emotion and meaning of architecture.

c) Design studio is a place where complex design processes occur and uncertainty exists. Because design is cognitive activity, study of design process and design studio pedagogy requires continuous long-term involvement. Thus, study of design process requires multiple methods of obtaining evidence, such as observation, interview, and review of documents and visual materials.

d) There are many aspects to the design process, and aesthetics is one of the important aspects. Aesthetics is design knowledge delivered via instructor-student interaction.

e) The design studio instructors' knowledge is artistry, and they coach students by examples.

f) With regard to the development of architectural studio, the École des Beaux-Arts valued learning from history and learning from drawings of buildings. In the Bauhaus, art and craft were considered equal, and aesthetics was a very significant component by learning theories of visual perception.

g) Accreditation associations issue Student Performance Criteria and thereby influence architectural education curriculum, but aesthetics is not clearly manifested in the criteria because it is not easily measurable. Aesthetics is included indirectly in the

explanation of other terms. Thus, aesthetics is subjective in nature but its significance for architectural quality and education is well perceived.

Working Definition of Aesthetics in Architecture in This Study

Therefore, I suggest a working definition of *aesthetics* for this study. Based on the literature review, the definition needs to encompass (a) design process and product (i.e., outcome); (b) formal and symbolic aesthetics; and (c) the objective nature of architecture itself and the subjective nature of people's emotions and perceptions.

This research presents a process for generating a theory of pedagogy of aesthetics. The term *aesthetics* is not often discussed directly. As seen through the literature review, in the architecture field, the term *aesthetics* is not frequently used; instead, different terms such as *balance, order, proportion*, *fitness*, or *affordance* (Gibson, 1979) are used to imply the aesthetic qualities of architecture (Gibson, 1979; Lang, 1987; Nesbitt, 1996). Thus, I propose a working definition of *aesthetics* in architecture as follows:

> Aesthetics is a quality of architecture, which resides both in the exterior and in the interior and which describes conceptual, formal, and symbolic aspects that give delight and pleasure to people.

Aesthetics comes forth throughout the design process and to the design product outcome. In the design process, aesthetics involves the conceptual harmony of the whole work, consistency of concept and design solution and relevance to functional purposes. It also involves design principles, such as balance, contrast, harmony, and hierarchy. In addition, it requires appropriate use of elements in architecture, such as material, finishes, color, and light. In the product stage, aesthetics involves board composition and design, layout, and size of photos or components. Symbolic meaning appropriate to the form also comes forth in the design product.

CHAPTER III

RESEARCH METHOD

This chapter describes the research method for this study. It includes an explanation of the research paradigm and questions, sampling criteria and data collection methods, data analysis and synthesis, and validity issues.

Research Paradigm

Paradigm is a term that has been used in research methodology and theory since Thomas Kuhn introduced it in *The Structure of Scientific Revolution* (1962). Kuhn's original definition is an "entire constellation of beliefs, values, techniques, and so on shared by members of a given community" (as cited in Bryant, 1975, p. 354). Within the social science context, Crotty (2003) defined *paradigm* as "an overarching conceptual construct, a particular way in which scientists make sense of the world or some segment of the world" (p. 35). Guba and Lincoln (1994) defined it as "a set of basic beliefs (or metaphysics) that deals with ultimate or first principles" (p. 107). In the education field, Hatch (2002) explained it as "sets of assumptions . . . concerning how the world is ordered, what we may know about it, and how we may know it" (p. 11). Thus, a research paradigm reflects not only a research direction and framework, but also a worldview and the way of understanding knowledge, value, and reality.

Guba and Lincoln (1994) suggested that one's paradigm could be framed through his or her standpoints in relation to three types of questions: ontological, epistemological, and methodological. Because the topic and structure of a study takes form through a

researcher's use of appropriate theory and method, it is necessary to understand his or her research paradigm to evaluate the results.

The following is a brief discussion of paradigm of this research by reviewing three frameworks for study: ontology, epistemology, and axiology.

Ontology, Epistemology, and Axiology

Ontology is "the branch of metaphysics dealing with the nature of being" (*Oxford Dictionary of English*, 2003). Lincoln and Guba (2003) suggested four different ontological stances: naïve realism, critical realism, relativism, and historical realism. Naïve realism refers to the belief that reality is understandable; critical realism propounds that reality is only partially and probably understandable; relativism states that there is no absolute reality, that it is partially constructed; and historical realism refers to the belief that reality is formed by social, political, economic, and gender issues.

Epistemology is "the theory of knowledge, especially with regard to its methods, validity, and scope, and the distinction between justified belief and opinion" (*Oxford Dictionary of English*, 2003). Epistemology relates to the following questions: What kind of knowledge do I try to obtain through my research? What is the nature of the knowledge generated by my research? Crotty (2003) divided the viewpoints of epistemology into three categories: objectivism, subjectivism, and constructionism.

The proponents of objectivism believe that meaningful reality exists apart from individual consciousness. As a researcher, one discovers the meaning that is inherent in reality; positivism and postpositivism rest under this umbrella. Constructionism holds the belief that no meaning exists without a researcher's interaction with reality. Thus, as a researcher, one constructs, rather than discovers, the meaning. Depending on the types of

people and realities one interacts with, resultant meaning may be different. Critical theory and feminist approach belong to this type of epistemology. Subjectivism states that "meaning is imposed on the object by the subject" (Crotty, 2003, p. 9). The object does not create its own meaning. Only the subject grants meaning. Structuralism, poststructuralism, and postmodernism belong to this type of epistemology.

Axiology is "the study of the nature, types, and criteria of values and of value judgments" (*Merriam-Webster Online Dictionary*, 2003). The primary focus of axiology in research lies in the goals, value-ends, and interests of research. Habermas suggested that axiology comprises three different research interests: technical, practical, and emancipatory (as cited in Herr & Anderson, 2005). Technical interest aims to explain, predict, and control; practical interest aims to understand; and emancipatory interest aims to critically reflect on and transform knowledge.

The Paradigm of This Research

Hatch (2002) introduced five common paradigms in education research: positivist, postpositivist, constructivist, critical/feminist, and poststructuralist. Among them, the paradigm of this research seems to be closest to *constructivist paradigm*. The constructivist paradigm has a relativist ontology, constructionist epistemology, value-laden axiology, and naturalistic methodology (Hatch).

I have a similar stance to constructivist ontology in that I believe multiple realties exist because all individuals experience the world differently depending on their own viewpoints. In terms of epistemology, I believe that knowledge is not only objective, and meaning comes from the interaction between people and reality. In addition, I have a belief that the meaning(s) of aesthetic education will come from understanding the two

primary groups' (students and instructors) perspectives of current aesthetic education. Regarding ontology, I believe the value-ends of research are to understand reality. The ultimate goal of this research is to bring us to an understanding of the current state of aesthetic education in architectural design studio. Thus, on reviewing the five paradigms, the constructivist paradigm seems most suited as a label for this study.

The purpose of this research is to understand the current pedagogy of aesthetics in architectural design education and the process through which the students and instructors experience aesthetic education.

Case Study Using a Qualitative Research Method

This is a multiple-case study using a qualitative research method. Qualitative research takes a holistic and naturalistic approach. In contrast to quantitative research's purpose to predict and generalize, a qualitative research method seeks to describe a certain real phenomenon within a certain context.

The main characteristics of the qualitative research method are an emphasis on interpretation and meaning and a focus on how the respondents make sense of their own circumstances. Qualitative research employs various tactics, such as questionnaires, face-to-face interviews, diaries, photographs, or sketches (Creswell, 2003; Denzin & Lincoln, 1998; Groat & Wang, 2002). Within the boundary of qualitative research, this study fits into a case study format. *Case study* is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, as cited in Groat & Wang, p. 346).

Groat and Wang (2002) suggest five characteristics of case studies: (a) study of a setting or phenomenon in a real-life context; (b) the capacity to explain causal links; (c) the role of theory development; (d) use of multiple sources of evidence; and (e) the power of a theory's generalizability (p. 346). On reviewing the five aspects and in consideration of this study's goals—to understand the pedagogy and process of aesthetic education in architectural design studios—this research is appropriate for a case study approach because it meets the first four of these five criteria: (a) the studio classes are a real-life context which involves complex and dynamic phenomena; (b) the three studios contain potential factors such as strategies used by instructors that may explain students' outcomes in designed products with high aesthetic quality; (c) the researcher aims to generate a theory that will explain the pedagogy of aesthetics; and (d) the researcher uses multiple sources of evidence in the research process.

What distinguishes a case study approach from other kinds of qualitative studies is the nature of boundaries. Case study has a boundary or a unit of analysis, such as "a program, an event, a person, a process, an institution, or a social group" (Yin, 1994, p. 13). Thus, in order to understand what occurs in terms of aesthetic education in design studios, the research has to be based on real-life contexts and involve multiple sources of evidence that will help researchers find answers to the questions. As Merriam (1998) said, qualitative case study is the best possible method for understanding educational phenomena. Hence, by undertaking this type of case study, I can provide in-depth descriptions and analysis of the multifaceted characteristics of the aesthetic education in three architectural design studios.

Research Method and Sampling Criteria

Research Sampling: Schools and Studios

For the sampling process, purposeful sampling was used. *Purposeful sampling* is "selecting information-rich cases strategically and purposefully" (Patton, 2002, p. 243). *Information-rich* cases are those "from which one can learn a great deal about issues of central importance to the purpose of the inquiry" (Patton, p. 230).

The three midwestern universities in this study were selected based on my geographic convenience and reputations of the programs by *Design Intelligence,* a magazine that rates the best architecture/interior design programs across the nation (http://www.di.net/archschools/schools.html). Two of the schools have programs accredited by the National Architectural Accrediting Board (NAAB). The third school was accredited by the Council for Interior Design Accreditation (CIDA), and it provides an architectural studies program (prearchitecture program) as well. The three schools were listed in *Design Intelligence* as a top-10 architecture/interior design program between 2007 and 2009.

The three instructors' design studios were selected based on two criteria: (a) those who received at least one teaching award from their respective university, as well as (b) those who were recommended by each school's associate dean/department chair for their ability to help students produce design outcomes with high aesthetic qualities. The teaching awards that the three instructors received were diverse, ranging from specific studio teaching awards to general teaching awards not confined to studio. The nature of each school and its studio are summarized in Tables 1 and 2, respectively.

Table 1

Summary of Nature of School

Univer-sity	Public/ private	College/school	Affiliation	Accredita-tion	Degrees offered
School A	Public	College of Human Environmental Science	Architectural Studies	CIDA	Bachelor of Science in Architectural Studies Master of Art in Architectural Studies Master of Science in Architectural Studies Ph.D. in Human Environmental Science, Architectural Studies
School B	Private	School of Design and Visual Arts	Architecture Urban Design	NAAB	Bachelor of Art in Architecture Bachelor of Science in Architecture Master of Architecture Master of Landscape Architecture Master of Urban Design Master of Science in Advanced Architectural Design Master of Science in Architectural Studies
School C	Public	School of Architecture, Design and Planning	Architecture Urban Planning	NAAB	Bachelor of Arts in Architectural Studies Master of Architecture Master of Arts in Architecture Ph.D. in Architecture Master of Architecture / Master of Urban Planning Joint Master of Architecture / Master of Business Administration

Table 2

Summary of Nature of Studio

Studio name	Research period	Student grade	Number of total students	Number of participated students	Project type	Project topic
Studio A	2008 fall	4th year studio in undergraduate school (senior thesis studio)	11	11	Individual project	Chapel (one student: museum)

Studio B	2009 spring	2nd year elective studio in graduate school Joint studio, architecture and art department	13	12	Individual project Some collaboration with art students	Montessori school design
Studio C	2009 summer	1st year in graduate school	18	17	Individual project	Car exhibition space design
	Total		42	40		

Method of Data Collection

Institutional Review Board Approval

After the Campus Institutional Review Board approved this study, data collection started from beginning of the 2008 fall semester. I contacted four universities to check the possibility of their participation, and three universities agreed to participate. After meeting and explaining the purpose and procedure of the research, the associate deans/chairpersons of the universities recommended instructors for the study. On receiving the permission letters from the instructors and consent forms from their students, data collection began. To maintain the confidentiality of the participants, their identities were hidden, and pseudonyms were used in this research. The data collection period lasted from fall semester 2008 to summer semester 2009.

Observations

Observations were conducted about once a week for one academic semester per studio. I observed the first day of class (when class structure and design projects were explained), lectures, desk critiques (when discussions occurred between instructors and students), and several interim and final design reviews (when discussions occurred among instructors, students, and critics). I also observed the class activities and

interactions between instructors and students, and I audio-recorded the discussions. I wrote field notes of important parts of the discussions and nonverbal behaviors, such as tones of emphasis, facial expressions, and ambience of the classrooms during each visit.

As class observations progressed and students' designs developed, I focused on analyzing six students' design processes and their interactions with the instructor in depth (two students from each studio). It was to better understand how discussions with their instructor influenced their designs, design aesthetics, and design development. The six students were selected based on the amount of data obtained, the number of my observations of their design discussions with the instructor, the degree of my understanding of their design processes, and their willingness to participate in the research.

Document and Visual Material Review

I collected visual materials from students' design evolutions. The collected materials were photographs of sketches, physical modeling, computer-generated renderings, drawings, and presentation boards. These documents reflected students' design progress and the instructors' influence on students' design processes. In addition, instructors' sketches and class materials were collected, including sketches generated during desk critiques and materials such as syllabi, project descriptions, handouts for classes, lecture sources, and textbooks or examples suggested for the students. These informed me of strategies used to teach aesthetics of architecture in the studios. Moreover, I took photographs of the instructors' and the students' desks for their potential to reveal aesthetic preferences: People tend to post illustrations of their referring architect's works near their work areas. Given that I could not observe every class and all

students' design changes and development, I asked students to show me any design changes and reasons of such chances that occurred after my previous observation. Students showed me their design progress, so I took pictures of the design changes to fill any gaps in my direct observations and to grasp the continuity of their design processes.

Interviews

The qualitative research interview is an "attempt to understand the world from the subject's point of view, to unfold the meaning of people's experiences, to uncover their lived world" (Kvale, 1996, p. 1). Patton (1990) noted that interviewing goes along with the assumption that "the perspective of others is meaningful, knowable, and ought to be made explicit" (p. 278). Of course, the interview method as data collection has some limitations in that not all people are equally cooperative or articulate. In addition, the result depends on interview skills; and the interactions among interviewer, interviewee, and context influence the data result (Bloomberg & Volpe, 2008, p. 82). However, interviewing is a valuable method to reveal hidden phenomena and voices that are not easily observed.

Student Interview

In the middle of the semester, I interviewed students individually to examine their studio experiences, perceptions of aesthetics and aesthetic education, and perspectives on their instructor's teaching pedagogy. In addition, at the end of the semester, students completed an open-ended questionnaire to evaluate their studio experience. Overall, the interview time took 30 minutes. The interview data were audio-recorded with each interviewee's permission. The interviews were mainly semistructured questions rather than strictly structured; following are some examples of interview questions.

- In which classes do you think you learned aesthetics in your academic program?
- Among Vitruvius' *firmitas* (firmness), *utilitas* (utility), and *venustas* (beauty), how much does your instructor emphasize *venustas*?
- How does your instructor discuss the aesthetics of your design project?
- How do you understand aesthetics in architecture?
- What are good aspects of your instructor's teaching methods?
- What do you think about adding an additional class regarding aesthetics to your curriculum?

Teacher Interviews

Each instructor participated in two interviews to identify his teaching philosophy, pedagogy, strategies, and understanding of aesthetics in architecture: one at the beginning of the semester and one at the end. The first interview explored the instructor's education background, overall teaching philosophy and philosophy of teaching aesthetics and allowed me to become familiar with project goals and programs. The second interview revealed the rationale for using specific strategies or methods during the studio. Both interviews were semistructured. Each interview last lasted 40 to 50 minutes in general. The interviews were audio-recorded with each interviewee's permission and then transcribed; the following are examples of interview questions.

- How long have you been in architectural education?
- How long have you taught design studio?
- How do you define aesthetics in architecture?
- What is your philosophy of teaching aesthetics?
- What teaching tools or strategies do you use to help students to generate projects with aesthetic qualities?
- Which classes do you think are involved in the aesthetics of architectural

education?

- How different or similar do you think teaching aesthetics is from when you studied at university compared with the present?
- How do you think learning aesthetics at your university influenced your teaching?

Interviews—Associate Dean/Chairperson of Each School/Department

I conducted interviews with the associate dean or chair of each school/department at the beginning of the semester. The purpose was to understand the rationale for their recommendations of certain instructors as outstanding in aesthetic education. The interviews also helped me understand the curricula in terms of aesthetic education, mission, and the philosophy of each school; the following are some examples of the interview questions.

- What is the teaching philosophy and mission of your school?
- How does your school/department approach aesthetic education?
- Why did you recommend this specific instructor for this research?

Table 3 presents the research questions, their different purposes, and the sources of the answers.

Table 3

Matrix of Research Questions

Research question	**Goal**	**Source**
How is aesthetics taught in architectural design studio?	To understand current way of teaching aesthetics	Interview-dean/students/instructor
What are the three outstanding instructors' teaching methods and strategies regarding aesthetic education in design studio?	To identify outstanding instructors' teaching methods of aesthetics	Interview-dean/students/instructor Observation Document/visual material review

How do design studio instructors and students understand the current status of aesthetic education and perceive the aesthetics of architectural design?	To know students' and instructors' understanding of aesthetics and aesthetic education in architectural curriculum	Interview-dean/students/instructor Observations
What is the process of aesthetic education in design studio and how do students experience the process?	To understand the process of aesthetic education	Interview-dean/students/instructor Observation

Methods of Data Analysis and Synthesis

Data Analysis in Grounded Theory

The process of data analysis in qualitative research is "iterative, cyclical, and ongoing" (Bloomberg & Volpe, 2008, p. 15). Basically, in qualitative research the data analysis method is a process of identifying themes and patterns (Bloomberg & Volpe).

In this dissertation, the grounded theory method was used throughout the process, from the theoretical framework to data collection and analysis. *Grounded theory* means a method "in which the researcher attempts to derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study" (Creswell, 2003, p. 14). Grounded theory involves "use of an intensive, open-ended, and iterative processes that simultaneously involves data collection, coding (data analysis), and memo-writing (theory building)" (Groat & Wang, 2002, p. 181).

In grounded theory, data collection and data analysis run parallel and inform each other (Tesch, 1990). Likewise, in this research, data collection and analysis were parallel procedures. During observation, I wrote memos of my impressions of important discussions and issues. As soon as I obtained a certain amount of data, I transcribed the data and read them.

Whereas the coding process involves analysis, the synthesis process "reconstruct[s] a holistic and integrated explanation" (Bloomberg & Volpe, 2008, p. 85). In grounded theory, data analysis follows a set of procedures which involve coding and memo-writing.

Coding is defined as "the process of organizing the materials into 'chunks' before bringing meaning to those 'chunks'" (Rossman & Rallis, as cited in Creswell, 2003, p. 192). Coding is also explained as "categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data" (Charmaz, 2006, p. 43), and "the pivotal link between collecting data and developing an emergent theory to explain these data" (Charmaz, p. 46). Through coding, researchers seize the meaning of the data.

Memo-writing is the "pivotal intermediate step between data collection and writing drafts of papers" (Charmaz, 2006, p. 72). "Theoretical memos" form "a running record of insights, hunches, hypotheses, discussion about the implications of codes, additional thoughts, what not" (Strauss, 1987, p. 110). From memos, the researcher begins "to identify an emergent theme, pattern, or explanation" (Miles & Huberman, 1994, p. 67) and generates ideas for further data collection, as well as category modification (Tesch, 1990).

The coding process continues until saturation occurs. *Saturation* is the stage at which the researcher cannot find any new properties or when the researcher sees the same pattern again from the data. Glaser said *saturation* is "the conceptualization of comparisons of these incidents which yield different properties of the pattern, until no new properties of the pattern emerge," and it yields "the conceptual density that when

integrated into hypotheses make up the body of generated grounded theory with theoretical completeness" (as cited in Charmaz, 2006, p. 113). In this study, saturation occurred first in each case study (i.e., studio) and then during the comparative analysis stage. It was a challenging process to meet saturation within these three cases because each studio differed in terms of student characteristics (e.g., level of architectural knowledge), focus of studio project, as well as each instructor's emphasis on aesthetics, methods, and teaching philosophy. Thus, I first attempted to meet saturation in each case; and second, I seek to acquire saturation during the comparative analysis of data throughout the three studios. Due to the nature of design studio, some coding categories were unique to the given studio (see codes and categories in Appendix C, D, E, F).

The "constant comparative method of data analysis" is one of the primary characteristics of the grounded theory method (Bloomberg & Volpe, 2008, p. 11). *Constant comparison* is a process where "researchers engage in detailed analytic processes that require repeated confirmations of potential explanatory patterns discovered in the data" (Hatch, 2002, p. 26). It is used for the process of category clarification and category definition (Strauss, 1987, p. 45).

There are several procedures in coding: open, axial, and selective coding (Corbin & Strauss, as cited in Creswell, 2007, p. 150). *Open coding* is used for developing categories of information, *axial coding* is intended for interconnecting the categories, and *selective coding* is meant for generating a story that connects the categories.

To illustrate, once open coding has been developed, the researcher performs axial coding, the process of exploring the relationship among categories. Axial coding "consists of intense analysis done around one category at a time . . . This results in

cumulative knowledge about relationships between that category and other categories and subcategories" (Strauss, 1987, p. 32). Axial coding influences the "central phenomenon, the strategies for addressing the phenomenon, the context and intervening conditions that shape the strategies, and the consequences of undertaking the strategies" (Creswell, 2007, p. 151). Selective coding refers to the process by which researchers select one or more categories as core categories. In selective coding, "the analyst delimits coding to only those codes that relate to the core codes in sufficiently significant ways as to be used in a parsimonious theory" (Strauss, 1987, p. 33).

At the end of the analysis, a theory, "a set of theoretical propositions," is generated (Corbin & Strauss, as cited in Creswell, 2007, p. 150). Thus, analytical methods using grounded theory involve iterative coding and a clustering process to find themes and patterns until saturation occurs. The theory will come from the coding process, "in which the analyst looks at the data line by line for 'empirical indicators' consisting of 'behavioral actions and events, observed and described in documents and in the words of interviewees and informants" (Strauss, 1987, p. 27).

Charmaz (2006) proposed three stages of coding process with different terms from Corbin and Strauss's. The three stages are initial coding, focused coding, and theoretical coding. *Initial coding* is similar to open coding. *Focused coding* is a process to narrow down to frequent and important codes among initial codes. It is a kind of reduction process based on relevance and usefulness to the research questions. *Theoretical coding* is a process to find relationships between codes and categories; theoretical coding have a potential to be developed into a theory (Charmaz).

Data Analysis and Synthesis in This Study

Data analysis in this study took the following steps. First, four undergraduate students who are native English speakers and I transcribed the collected observation and interview data throughout the data collection period. The four transcribers were recruited from undergraduate students majoring in Architectural Studies. I reviewed their transcribed data to verify the contents and compared them with my memo-writings. Moreover, one of the four undergraduate students checked my transcriptions, and I rechecked her files against the original audio files and compared those against my field notes. During the research period, I reread the transcribed data until I had a sense of the direction for analysis.

Second, I coded the transcribed data line by line and incident by incident following the grounded theory analysis method. I conducted open coding of data from instructor interviews and student interviews separately. Then I developed focused coding. I set aside codes not related to my research questions as well as those did not occur frequently. Next, I conducted axial coding in order to find relationships between codes. Developed codes were divided into several categories, and I assigned labels to them. Through those processes, the most significant and frequent codes were identified.

Third, to analyze visual materials, I carried out a data reduction process. In order to understand the interaction of instructors and students as it relates to design progress through desk critique, I selected two students' design processes from each studio for more in-depth analysis (six students total).

Fourth, the discovered codes and categories were compared with visual material analysis and field notes. Comparisons of the observation data with the visual materials, as

well as the observation data with the interview data, were conducted to determine the relationships among the different types of data. Through searching common patterns and themes, I discovered seven categories from instructor interviews, six from student interviews, and six from observations.

The following tables 4, 5, and 6 are codes and categories from instructor interviews, student interviews, and observations (see codes and categories definitions in Appendix C, D, E).

Table 4

Code and Category from Instructor Interview

Category	**Instructor's education**	**Other experience**	**Curriculum**	**Studio project**	**Perception**	**Teaching Philosophy**	**Teaching Method**
Code	Education in aesthetics	Travel experience	Courses related to aesthetics	Emphasis on aesthetics	Alternative expression of aesthetics	Teaching philosophy of aesthetics	Teaching method of aesthetics
	Length of teaching	Work experience	Courses devoted to aesthetics	Focus of project	Nature of aesthetics		Teaching method for weak students
	Influence of learning		Differences in aesthetics		Nature of aesthetic education		Teaching method for strong students
	Influential teacher		Reasons for differences in aesthetics		Realms of aesthetic discussion		Rationale for teaching method
	School environment		Differences in aesthetic education		Reasons for lack of aesthetic education		
			Reasons for differences in aesthetic education				
			Overall emphasis on aesthetics in curriculum				

Table 5

Code and Category from Student Interview

Category	**Background**	**Curriculum**	**Studio project**	**Perception**	**Phenomena of studio**	**Perspective of studio Instructor**
Code	Studio experience	Courses related to aesthetics	Agree with instructor's opinions	Nature of aesthetics	Change of understanding of aesthetics through studio	Good features of the instructor
	Undergraduate major	Courses taken related to aesthetics	Emphasis on aesthetics	Nature of aesthetic education	Clash with instructor	Weak features of the instructor
		Desired courses relating aesthetics	Favorite assignments	Preferred building		Ideal design studio instructor
		Overall emphasis on aesthetics in curriculum	Focus of project			Features of instructor compared with other domains
			Lessons from the studio			Helpful teaching method

Table 6

Code and Category from Observation

Category	**Nature of aesthetics**	**Alternative expressions of aesthetics**	**Realms of aesthetic discussion**	**Studio project**	**Teaching method of aesthetics**	**Phenomena in aesthetics**
Code	Breaking symmetry	Appearance/look	Color	Emphasis on aesthetics	Articulation	Clash between instructor and students
	Consistency/ Coherence	Beauty	Concept-form match	Focus of project	Clarification of student talking	Revelation of instructor's aesthetics
	Composition	Form/shape	Detail		Customization	Review of function first
	Contrasts	Goodness	Exterior		Emphasis on model making	
	Fit to context	Impression	Facade		Emphasis on section	
	Focal points	Interesting aspects	Finish		Encouragement	
	Holistic aspects	Intriguing aspects	Geometry		Explanation in detail	
	Meaningful-	Organizing	Intention		Feedback and	

	ness	principle (Ordering idea)		guidance
	Non-literalness	Pleasing	Interior space	High expectations and standard
	Poetics	Powerfulness	in-between space	Principle and prototype
	Small palettes	Preference	In-out connections	Precedent–visual
	Spatial ambiguity	Proportion	Lighting	Precedent-verbal
	Special aspects	Richness	Material	References /examples
	Stand out aspects	Vocabulary /language	Module	Reading student design intention
	Uniqueness		Presentation board	Unique approach
	Variety of space		Scale	Use instructor's interest
			Sequence	
			Spatial experience	
			Spatial organization	
			Tactility	

Fifth, after I finished the respective case analyses of the three schools, I conducted a cross-case analysis among the three studios. The three cases were analyzed to see whether there were any common features of aesthetic education and common characteristics of teaching methods among the three instructors. In addition, I analyzed patterns among the three schools and the three instructors, relationships between the instructors and students' reactions, and the students' design evolutions. As a result, new themes were generated. The multiple source analysis and the cross-case analysis provided rich information as well as thick descriptions concerning current aesthetic education in design studios (see final themes, categories, and codes in Appendix F).

Finally, I developed the main core themes into a theory that explains the process, the pedagogy, and the perception of aesthetics within aesthetic education in the architectural design studio.

Validity

Validity is a criterion to check the thoroughness and power of a study. Validity determines "whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account" (Creswell & Miller, as cited in Creswell, 2003, p. 196). In qualitative research, validity is sometimes known by a different term, such as *credibility* or *transferability* (Guba & Lincoln, 1994; Lincoln & Guba, 2003).

Guba and Lincoln (1994) suggested four aspects to judge trustworthiness of research: truth value, applicability, consistency, and neutrality in the scientific/rationalistic paradigm. In the naturalistic paradigm, which includes qualitative research, the four aspects are called credibility, transferability, dependability, and confirmability.

Credibility leads to "plausible" findings. Guba (1981) indicated that it refers to whether the participants' perceptions match the researcher's interpretation. In other words, it is related to whether the researcher "accurately represented what the participants think, feel, and do" (Bloomberg & Volpe, 2007, p. 77). Guba suggested the following methods to enhance credibility: prolonged engagement at a site, persistent observation, peer debriefing, triangulation, collection of referential adequacy materials, member checks, establishing structural corroboration or coherence, establishing referential adequacy, and member checks (pp. 84-86).

Transferability is related to "context relevant" findings (Guba, 1981, p. 83), which means "how well the study has made it possible for the reader to decide whether similar processes will be at work in their own settings and communities by understanding in depth how they occur at the research site" (p. 83). Guba listed "do theoretical/purposive sampling, collect 'thick' descriptive data, develop thick description" (p. 86) as methods to enhance transferability.

Dependability leads to "stable" findings (Guba, 1981, p. 83), referring to "whether one can track the processes and procedures used to collect and interpret the data" (Bloomberg & Volpe, 2007, p. 78) and "the extent that research findings can be replicated by other similar studies" (p. 86). Bloomberg and Volpe suggested one should "provide detailed and thorough explanations of how the data were collected and analyzed." Guba suggested that researchers "overlap methods, use stepwise replication, establish an 'audit trail,' and arrange for a 'dependability' audit" (pp. 86-87) to ensure dependability.

Confirmability aims to produce "investigator-free" findings (Guba, 1981, p. 83) that correspond to objectivity in quantitative research. "The findings are the result of the research, rather than an outcome of the biases and subjectivity of the researcher" (p. 87). Guba suggested that researchers use "triangulation, practice reflexivity, [and] arrange for a confirmability audit" to enhance confirmability (p. 86).

According to Maxwell (1992), there are three kinds of validity in qualitative research: descriptive, interpretative, and theoretical. *Descriptive validity* refers to how accurately the researcher accounts and reports the data. It includes reporting the reality

without making up, distorting, omitting, or misunderstanding what the researcher observed or heard (Maxwell).

Interpretative validity concerns whether the researcher's interpretation of described events, objects, and participants' behaviors is valid. It is related to understanding the phenomena not from the researcher's perspective but from that of the participants. Interpretative validity is not only a matter of whether the participants represent their thoughts or opinions correctly, but also a matter of whether the researcher constructs the participants' meaning based on their own accounts (Maxwell, 1992).

Theoretical validity is a question of whether a theory generated from phenomena is valid. Usually a theory consists of two components, concepts (or categories) and the relationship between them. Thus, theoretical validity relates to the two stages of the theory: the validity of the concepts (construct validity); and the validity of the relationships among the concepts (internal or causal validity) (Maxwell, 1992).

Methods for Enhancing Validity in the Dissertation

Triangulation is one of the methods used to strengthen research by using combined methods (Patton, 2002, p. 247). Denzin (as cited in Patton, p. 247) suggested the following four types of triangulation: data triangulation (use of various data sources), investigator triangulation (use of several researchers or evaluators), theory triangulation (use of multiple perspectives to interpret a single set of data), and methodological triangulation (use of multiple methods to study a single problem). For this dissertation, I used three of the four types: data triangulation, theory triangulation, and methodological triangulation. I utilized a variety of data sources from observations, interviews, and visual material evidences. Because there is no established theory regarding the pedagogy of

aesthetics, I utilized the same data with concepts borrowed from study of design method and process and study of the professional/layperson gap. As in Charmaz's (2006) constructive grounded theory, researchers aim to construct a meaning for participants, it is a meaning making process- how students respond to the teaching,

In addition, Maxwell (1996) suggested eight methods for validity testing (pp. 109-114). Of the eight, the following five methods were used for this dissertation:

(a) Intensive, long-term involvement. I was involved at the research site intensively in observing studios about once a week on a regular basis for a whole academic semester. The total period of observation was one academic semester per studio. The long-term participant observations provided direct, rich data and helped me "rule out spurious associations and premature theories" (Maxwell, 1996, p. 110). In addition, interviews with the instructors, their students, and the dean or chairperson of each school allowed diverse perspectives and phenomena to occur in the real context.

(b) Rich, thick description. The intensive, long-term involvement allowed me to acquire rich data and thick descriptions to deliver the research context and meanings.

(c) Clarify bias the researcher brings to the study: A qualitative researcher is not separable from research findings and interpretations. Thus, I wrote an open narrative to acknowledge my personal interests and reflections on the research.

(d) Present negative or discrepant information. The multifaceted context and reality were described as they exist. Given that the research participants were instructors and students in universities, I asked students to give their frank

opinions of their instructors' teaching methods. The responses to the question revealed conflict and hidden voices in studio. The weak aspects were also described in order to reflect reality as it is. I reported the reality without distortion or making up responses.

(e) Using peer debriefing to enhance the accuracy of the account. The research findings were discussed with other qualitative researchers in terms of research procedures and analysis so I could improve the accuracy of data interpretation.

In the next chapter, I will report how aesthetic education is situated in a studio context and will describe what occurs in the studio environment. In addition, I will present the way aesthetics is taught in each studio and how students perceive that educational process.

CHAPTER IV

FINDINGS

This chapter discusses findings from data analysis. Findings are organized in the following seven sections: (a) three studios' course structures and participants' characteristics; (b) emphasis of studio projects regarding aesthetics; (c) instructors' educations and teaching philosophies of aesthetics; (d) customized aesthetic education observed through six student cases; (e) common themes of aesthetic education among the three instructors; (f) participants' perceptions of aesthetics and aesthetic education; and (g) students' perspective on the teaching methods of their instructor.

Course Structure and Participants' Characteristics

Studio A

Studio A was taught in a Council for Interior Design Accreditation (CIDA) accredited undergraduate program providing both interior design and pre-architecture. The studio observations were conducted during the 2008 fall semester. The observed studio was a senior students' studio, their final studio course before graduation. The four-credit-hour studio met every Tuesday and Thursday from 1:00 to 4:30 p.m., and I observed the studio a total of 10 times. For the first 12 weeks, I observed almost every week in order to better understand the nature of the project, the instructor's intention for the project, students' design processes, and student-instructor interactions. I skipped 3 weeks at the end of the semester. It is because during that period, students tended to work individually to produce final presentation materials such as computer renderings, physical

models, and presentation boards; and regular desk critique in studio and discussions with their instructor were not the primary activities. Last, I observed the final jury at the end of the semester. During that semester, I interviewed the studio instructor twice, students twice, and the department chair once. The following table shows the data collection period for the studio.

Table 7

Data Collection Period for Studio A

		Fall 2008															
		Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	total
Activities		Assignment 1			M-crit 1		Assignment 2			M-crit 2		Assignment 3					F-crit	
Observation																		10
Interview	Students						1										2	2
	Instructor				1												2	2
	Chair				1													1

Note. M-crit = midsemester critique. F-crit = final critique at the end of semester.

The project for studio A was a chapel design, and the work scope for students was both in architectural and in interior design. The project consisted of three big assignments. Assignment 1 was to learn and understand lighting systems and conceptual design of the chapel. Assignment 2 was to generate the overall layout of the chapel including floor plans, sections, elevations, and a physical model. Assignment 3 was to develop detailed plans and the interior design of the chapel. After assignments 1 and 2, there were midcritiques, and a final critique was held after assignment 3. The course objective was written as follows:

> The objective of this course is to enable students to synthesize all previous course work by addressing and providing a solution for a design problem

> defined in Programming for Thesis Studio [course name]. Students are expected to achieve a high level of competence in an interior design project that integrates *Commodity, Firmness,* and *Delight*. (from syllabus)

Students had taken "Programming for Thesis Studio" in the semester prior to the one I observed, and in that course, students learned programming requirements of the chapel and conducted site analysis. The instructor had 16 years of studio teaching experience at the time of observation. After earning his undergraduate degree in architecture and practicing architecture for 10 years, he earned his Ph.D. and became a full-time professor. He usually teaches one undergraduate lecture, one design studio, and one graduate class per semester. He was the recipient of numerous teaching awards from the university where he was employed.

He provided three required books for the class, as listed in Table 5. Among them, Crosbie's (2007) *Houses of God: Religious Architecture for a New Millennium* introduced world famous church designs with abundant photos and drawings. Heathcote and Moffatt's (2007) *Contemporary Church Architecture* contains not only church examples but also a brief history of 20th-century churches. *Time-Saver Standards for Interior Design and Space Planning* is a comprehensive, standard handbook of interior design. Among the three books, the instructor used the first two frequently during the desk critiques; and students also looked at the books quite often.

There were a total of 11 students (eight women and three men), and all the students participated in this research. For all, the senior studio was their thesis studio. Only one male student designed a museum, whereas the other students designed a chapel. Students could freely select any denomination for the chapel. The ethnicity of the students consisted of nine Whites, two Asian Americans, and one Asian.

The design studio was held in a separate independent classroom that only the senior students were allowed to use. As a result, the studio environment was intimate and focused, and the instructor's discussions with any one student were easily heard by the rest of the students. The instructor seemed to enjoy talking with the students, based on the observation that he continued his desk critiques past the class hour. The following is a summary of the class structure.

Table 8

Class Structure of Studio A

Classroom environment	A separate independent classroom
Required books	Crosbie, M. J. (2007). *Houses of God: Religious architecture for a new millennium*. New York: Images Publishing Group. Heathcote, E., & Moffatt, L. (2007). *Contemporary church architecture*. New York: Wiley. De Chiara, J., Panero, J., & Zelnik, M. (2001). *Time-saver standards for interior design and space planning*. New York: McGraw-Hill.
Project	Assignment 1: Lighting systems and conceptual design (1st – 4th week) Assignment 2: Overall layout of the chapel: Floor plans, sections, elevations, model (5th – 9th week) Assignment 3: Detailed plans and interior design of a central space in the design (10th – 16th week)
Additional activity	Light box exploration
Course objectives/written philosophy (quoted from course syllabus)	The objective of this course is to enable students to synthesize all previous course work by addressing and providing a solution for a design problem defined in Programming for Thesis Studio. Students are expected to achieve a high level of competence in an interior design project that integrates *Commodity*, *Firmness*, and *Delight*. The projects should reflect thoroughness in attention to aesthetic and technical aspects of design including construction, building systems, lighting and materials, as well as application of environment and behaviour knowledge. The projects should aim for well-developed solutions, rich in details that celebrate innovation, imagination, and creative solutions for human existence.
Evaluation of student project (quoted from course syllabus)	Your final presentation will be evaluated based on the quality of its visual and verbal content. Special attention will be given to the development of the concept as well as the format, clarity, aesthetics, innovation and creativity of your design solution. Grading in this class is important only if it helps you to reflect on your progress and accomplishments. No matter what objective criteria exist and no matter how fair your instructor wants to be, there will always be an element of subjective judgment. This means that your instructor will occasionally make mistakes. Do not lose sight of the bottom line, which is the work itself. Try to perform at your highest level. Acknowledge and discuss the reasons behind uneven performance. Move ahead. Continue to grow toward your professional objectives and remember that your talent, commitment, desire and your passion about the project will virtually guarantee exceptional final results.

Figure 4. Studio A student desks.

Figure 5. Studio A entrance.

Figure 6. Studio A environment.

For an in-depth analysis of interaction between students and the instructor, I focused on two students' design development stage from the observed data in each studio. This was also intended to help me better understand how discussions with their instructor influenced students' design aesthetics and design development. The two students from each studio were selected based on the amount of data obtained for the research and their willingness to participate in this study. Those students' pseudonyms are indicated in Table 9.

Table 9

Student Demographics of Studio A

Studio A	Student	Pseudonym	Gender	Ethnicity	Current Major	Studio Experience
Studio A	1	Anne[a]	Female	White	Interior design	5th studio
	2		Female	White	Interior design	5th studio
	3		Female	White	Interior design	5th studio
	4		Female	White	Interior design	5th studio
	5		Female	White	Interior design	5th studio
	6		Female	Asian	Interior design	5th studio
	7		Female	Asian American	Interior design	5th studio
	8		Female	Asian American	Architecture	5th studio
	9	Bill[a]	Male	White	Architecture	5th studio
	10		Male	White	Architecture	5th studio
	11		Male	White	Architecture	5th studio
Total	11		Female (8) Male (3)	White (8) Asian American (2) Asian (1)	Interior design (7) Architecture (4)	

[a] Indicates students analyzed in detail in the Customized Aesthetic Education Observed Through Six Students' Cases section of chapter 4.

Studio B

Studio B was taught in a National Architectural Accrediting Board (NAAB)–accredited architecture graduate program in a private university. Studio B was an elective, six-credit-hour graduate studio class, which met three times per week from 1:30 to 5:30 p.m. The studio observations were conducted during the 2009 spring semester, and I observed the studio a total of 10 times. There were four assignments in the studio, and I observed one to two times per assignment, three midcritiques, and one final critique. During the semester, I interviewed the instructor twice, students twice, and the associate dean of the school once. The following table shows the data collection period for studio B.

Table 10

Data Collection Period for Studio B

		Spring 2009															
		Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	total
Activities		Project 1		M-crit	Project 2		M-crit	Project 3				M-crit	Project 4				F-crit	
Observation																		10
Inter-view	Students									1							2	2
	Instruc-tor	1															2	2
	Associate Dean	1																1

Note. M-crit = midsemester critique. F-crit = final critique (presentation) at the end of semester.

The design project of the semester was a Montessori school design, entitled "Space and learning in contemporary elementary education." The work scope for students was architectural design with an emphasis on interior space. The fundamental pedagogical concepts were written into the syllabus as follows:

> 1) In designing elementary schools, architects exercise a critically important influence on our children, both as human beings and as citizens—the opportunity to change society for the better;
> 2) Self-determined, "learning by making" educational practices, such as [those of] Froebel, Montessori, and Reggio Emilia, are today being increasingly recognized as the most effective way to educate young children, and to integrate them into their environment, their built place, and their culture;
> 3) From its very beginning, one of the fundamental characteristics of Modern architecture has been its sharing of ordering ideas and perceptual insights with the other Modern arts;
> 4) What matters in architecture is not what a building *looks lik*e, but what a building *is like to be in, to live in*—how it is *experienced* in inhabitation by many people over many years. (from syllabus)

The Montessori school design consisted of four big projects. Project 1, titled "Carving the Classroom – Abstract CUBE" was to create a cube-shaped classroom as a

standard classroom of a Montessori school. Project 2, "Etching the Earth – Concrete DATUM," was to develop a Montessori school layout based on one artwork assigned to each student. Project 3, "A Montessori School for University City," was to develop a Montessori school design on the actual site. Project 4, "Section/Tectonic – Between Earth and Sky," was to work on sections and materiality of students' building design and develop details. After each of project 1, 2, and 3, there was a midcritique, and the final jury was held after project 4.

The instructor had 13 years of studio teaching experience at the time of observation. After earning his undergraduate in environmental design and graduate degrees in architecture, he became a full-time professor and a practicing architect. He was also an author of several books on well-known American architects of the modern period, such as Louis Kahn and Frank Lloyd Wright. He focused especially on the interior qualities of the architects' work. He was named one of the 10 best educators in architectural education in the United States by the magazine *Architect*.

For his graduate studio, he had more than 10 required books or articles, listed in Table 11. The required texts seem to be divided into three categories overall. One category encompassed certain theories of architecture and art that the instructor admired and included books such as Paul Klee's *The Thinking Eye*, Kenneth Frampton's *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*, and Pallasmaa's *The Eyes of the Skin*. Another category referred to Montessori philosophy, including titles such as Lillard's *Montessori: A Modern Approach,* and Pittelli's "Dr. Montessori's Own Handbook"; and the last comprised architecture books containing examples of school design, such as Hertzberger's *Space*

and Learning: Lessons in Architecture. Taken together, these books showed certain directions the instructor pursued in design, including an emphasis on tactility and the use of all the senses in architecture, considering more than just the visual aspects of a building.

There were a total of 13 students (eight women and five men) in the studio, and 12 students participated in this research. Nine students were Whites, whereas four were Asians. Because the observed studio was an elective graduate studio in a professional architecture degree program, students' backgrounds varied greatly. For some students, the observed studio was their second studio in graduate school; for others, it was their sixth studio in graduate school. Unlike studios A and C, studio B was an elective course that students selected through a "lottery" system. With this system, in the beginning of the semester, students listened to all studio faculty presentations about their course plans and project intentions, ranked preferred studios, and applied for the studios they wish to attend. Due to the lottery system, most studio B students wanted to take that particular course. Table 11 is the summary of the class structure, and Table 12 is that of participating student demographics in studio B.

Table 11

Class Structure of Studio B

Classroom environment	Studio classroom is located within a large room with other studio students A big open room, noisy, easy to communicate with other studio students but easily interrupted by other studio students Competitive environment among studios through lottery system Large number of international students
Required books	Arendt, H. (1958). *The human condition*, Chicago: University of Chicago Press Benedikt, M. (1987). *For an architecture of reality*. New York: Lumen Books. Chipperfield, D. (1994). *Theoretical practice*. London: Artemis. Frampton, K. (2001). *Studies in tectonic culture: The poetics of construction in nineteenth and twentieth century architecture.* Cambridge, MA: MIT Press. Hertzberger, H. (2008). *Space and learning: Lessons in architecture 3.* Rotterdam: 010 Publishers. Klee, P. (1992). *The thinking eye* (R. Manheim, Trans.). New York: George Wittenborn. Lillard, P. (1988). *Montessori: A modern approach*. New York: Schocken Books. Pallasmaa, J., & Holl, S. (2005). *The eyes of the skin: Architecture and the senses*. Chichester: Wiley-Academy. Pittelli, A. (1965). Dr. Montessori's own handbook. *Pediatrics, 36*(1), 152. Rowe, C., & Slutzky, R. (1963). Transparency: Literal and phenomenal. *Perspecta, 8*, 45-54. Zumthor, P. (2006). *Atmospheres: Architectural environments, surrounding objects*. Basel: Birkhäuser.
Project (quoted from course syllabus)	Project 1: Carving the Classroom – Abstract CUBE (1st – 3rd week) Project 2: Etching the Earth – Concrete DATUM (4th – 6th week) Project 3: A Montessori School for University City (7th – 11th week) Project 4: Section/Tectonic – Between Earth and Sky (12th – 16th week)
Additional activities	Optional field trip during the spring break Collaboration with the art department instructor and his students
Course objectives/written philosophy (quoted from course syllabus)	1) In designing elementary schools, architects exercise a critically important influence on our children, both as human beings and as citizens—the opportunity to change society for the better; 2) Self-determined, "learning by making" educational practices, such as [those of] Froebel, Montessori, and Reggio Emilia, are today being increasingly recognized as the most effective way to educate young children, and to integrate them into their environment, their built place, and their culture; 3) From its very beginning, one of the fundamental characteristics of Modern architecture has been its sharing of ordering ideas and perceptual insights with the other Modern arts; 4) What matters in architecture is not what a building *looks like*, but what a building *is like to be in*, *to live in*—how it is *experienced* in inhabitation by many people over many years; 5) As we begin the 21st century, every architectural project should be understood as *an addition* to a pre-existing inhabited context, whether urban, suburban, or rural, and that today new projects are often called upon to remedy past environmental mistakes; 6) A graduate studio project should offer the individual student the opportunity to *begin again*, to re-establish their philosophical, technical, and formal grounds for architectural design, as well as to rediscover the fundamental principles of their discipline.

Evaluation of student project (quoted from course syllabus)	1) design process 2) degree of development of interior space 3) exploration of experiential qualities

Table 12

Student Demographics of Studio B

Studio B	**Student**	**Pseudonym**	**Gender**	**Ethnicity**	**Undergraduate major**	**Studio experience in graduate school**
Studio B	1		Female	White	Architecture	2nd studio
	2		Female	White	Art	2nd studio
	3		Female	White	Industrial engineering	6th studio
	4		Female	White	Architecture	6th studio
	5		Female	Asian	Biology/architecture minor	4th studio
	6		Female	Asian	Architecture	2nd studio
	7	Emily[a]	Female	Middle East	Architectural history	6th studio
	8		Male	White	Architecture	2nd studio
	9		Male	White	Architecture	2nd studio
	10	Drew[a]	Male	White	Art	6th studio
	11		Male	Asian	Architecture	2nd studio
	12		Male	Asian	Architecture	2nd studio
Total	12		Female (7) Male (5)	White (7) Asian (4) Middle East (1)	Architecture (7) Art/Architectural history (3) Other (2)	2nd (7) 6th (4) 4th (1)

[a] Indicates students analyzed in detail in the Customized Aesthetic Education Observed Through Six Students' Cases section of chapter 4.

The design studio was held in one big open studio, shared with other graduate studio students. It had the merits of easy communication with other studio students, but had disadvantages of being noisy and easy to be distracted by other students. The school had a relatively large number of international students compared with studios A and C. Having a rich travel background, the instructor took students to the Netherlands during

their spring break, where they visited a great number of Montessori schools including those designed by Hertzberger, the author of *Space and Learning: Lessons in Architecture*, a textbook for the class.

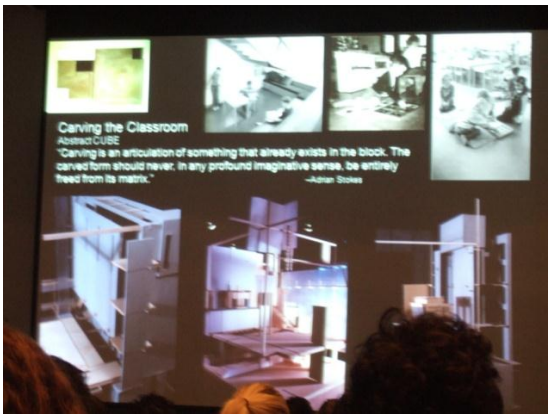

Figure 7. Project introduction in studio B.

Figure 8. Studio B environment.

Figure 9. Students' work at midcritique and final critique in studio B.

Studio C

Studio C was taught in a NAAB-accredited architecture graduate program in a public university. The observations were conducted during the first core graduate studio during the 2009 summer semester. Because the studio was taught during the summer semester, it spanned 8 weeks, and two instructors taught it in a consecutive order. The first half of the class (4 weeks) was taught by the recommended instructor, and the

second half of the class (4 weeks) was taught by another instructor. I observed the entire first 4-week session. Observations were conducted almost every day of the class instead of once per week. The six-credit-hour summer studio met from Monday to Thursday, four times per week, from 1:00 to 4:30 p.m. During the semester, I interviewed the instructor twice, students once, and the associate dean of the school once. The reason for only one interview with students is that studio C lasted 4 weeks, and, compared with the length of studios A and B, it did not seem that such a short time would change students' experiences of their instructor much; in addition, the students' schedules for that short period did not allow two interviews. Table 13 shows the data collection period for the studio.

Table 13

Data Collection Period for Studio C

		Summer 2009																
		Observation (4 weeks, 4 days/week)																
		1				2			3				4				5	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Activities		Assignment 1		Assignment 2		Assignment 3			Assignment 4								F-crit	
Observation																		13
Interview	Students															1		1
	Instructor	1														2		2
	Associate Dean	1																1

Note. F-crit = final critique (presentation) at the end of the semester.

Given that the observed studio was the first core course for graduate students, most students did not have any architectural design studio experience. Unlike studios A and B, in studio C, there were several small scale activities and assignments almost every day to familiarize the students with the architectural design process and studio culture. The project consisted of four assignments. Assignment 1 was getting familiar with

architecture of Louis Kahn, one of the most famous American architects of the 20th century. Students were asked to find one of Kahn's buildings and present their understanding of the building in class. Assignment 2 was to analyze Kahn's Kimbell Art Museum with sketches and diagrams. Assignment 3 was to make a model of the museum and study car travel/movement limits. Assignment 4 was the student's design project, entitled "Housing a Private Car Collection," which involved designing a car exhibition space as an addition to an existing house. The first three assignments were for learning architectural elements and design processes; and the final project was intended for students to demonstrate their design ideas and solutions. The work scope was architecture design.

The instructor had 10 years of studio teaching experience at the time of observation. After earning his undergraduate and graduate degrees in architecture, he became a part-time instructor and a practicing architect. He had received a studio teaching award from the university where he was employed.

Among a total of 18 students (seven women and 11 men), 17 students participated in this research. Only one student was an international student (from the Middle East); 15 were White and one was Hispanic. For one student whose undergraduate majors were interior design and architectural studies, it was her seventh studio course experience, but for the rest, it was their first studio experience. One unique characteristic of studio C was that the students were relatively older and had other occupations in the past. They enrolled in the architecture school to pursue their dream of becoming an architect; thus they were very serious about the course project and the interview process. Table 14 is the

summary of the class structure, and Table 15 presents student demographics of participants from studio C.

Table 14

Class Structure of Studio C

Classroom environment	Separate studio room. Studio classroom is next to the instructor's room
Required books	Ching, Francis D. K. (1998). *Design drawing.* New York: John Wiley and Sons.
Project	Assignment 1: Learning Kahn's architecture Assignment 2: Analysis of Kimbell Art Museum Assignment 3: White site model. Car travel/movement limits Assignment 4: Housing a private car collection
Additional activity	Small assignments or activities for each class
Course objectives/written philosophy (quoted from course syllabus)	1) Develop the ability to think spatially 2) Understand graphic conventions and develop graphic fluency 3) Understand the role of model building in both design and presentation formats 4) Consider the role of movement/sequence as it relates to a building program 5) Introduce the notion of site 6) Introduce the role of structure 7) Introduce the role of materiality 8) Develop an understanding of a building program 9) Emphasize time management and deadline coherence 10) Develop the ability to space and write about architectural propositions 11) Develop an understanding of human behavior relative to the physical environment
Evaluation of student project (quoted from course syllabus)	Grades are the subjective evaluation of your work by the studio critic. As previously mentioned, attendance is mandatory and your daily evaluation will reflect this. Your semester grades will contain elements of both group and individual participation. Completeness and the ability to meet deadlines will contribute to your final grade.

Table 15

Studio C Student Demographics of Studio C

Studio C	Student	Pseudonym	Gender	Ethnicity	Undergraduate Major	Studio experience
Studio C	1		Female	White	Biology	1st studio
	2		Female	White	Architecture (Junior)	1st studio
	3		Female	White	Business	1st studio
	4	Hannah[a]	Female	White	Mathematics/Physics	1st studio
	5		Female	Hispanic	Architecture/interior design	1st studio (7^{th} when

						including her undergraduate)
	6		Female	Arab	Art	1st studio
	7	Kevin[a]	Male	White	Business Management/Art	1st studio
	8		Male	White	Business	1st studio
	9		Male	White	Mechanical engineering	1st studio
	10		Male	White	Business	1st studio
	11		Male	White	Environmental studies	1st studio
	12		Male	White	Architecture (Junior)[b]	1st studio
	13		Male	White	Science education	1st studio
	14		Male	White	History	1st studio
	15		Male	White	Architecture (Junior) [b]	1st studio
	16		Male	White	Finance	1st studio
	17		Male	White	Film studies	1st studio
Total	17		Female (6) Male (11)	White (15) Hispanic (1) Middle East (1)	Architecture (4) Other (13)	1st (16) 7th (1)

[a] Indicates students analyzed in detail in the Customized Aesthetic Education Observed Through Six Students' Cases section of chapter 4.

[b]Indicates students who are juniors in an undergraduate program but took core studio with graduate students.

The design studio classroom was a separate studio room, next to the instructor's room and the pin-up room. The proximity of the three spaces—instructor's room, studio, and pin-up room—seemed to encourage the instructor and students to interact actively and effectively. The instructor could easily bring books or references from his room to the studio, and students could easily visit the instructor and ask questions. The studio environment was collaborative rather than competitive. The instructor was charismatic and straightforward during desk critiques. Almost every day there were pin-ups.

Figure 10. Studio C environment.

Figure 11. Instructor's room next to studio C.

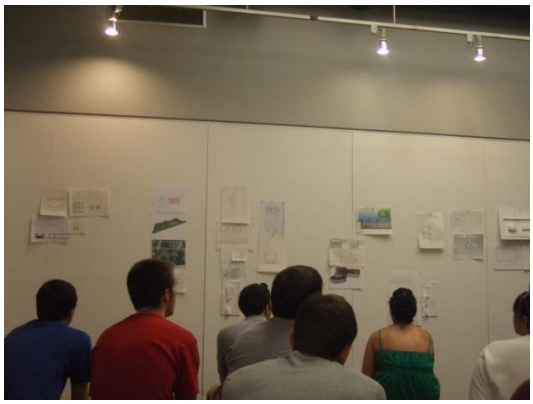

Figure 12. Pin-ups and final critique in studio C.

Emphasis of Studio Project Regarding Aesthetics

This section reports the emphasis of the studio project of each studio and its relation to aesthetics. Based on my observations and literature review, the discussion of aesthetics did not occur as a purely independent topic. Discussion of aesthetic aspects intertwined with that of other aspects, such as function, structure, use of material, and human experience.

As Boyer and Mitgang (1966) stated, "at schools which use the studio to guide students through a gradually more complex and integrated exploration of architecture in its many dimensions—aesthetics, cultural, historic, practical, and technical—there can

hardly be too much [dimension]" (p. 88). Accordingly, when analyzing discussions from the three studios, I kept trying to extract comments related to aesthetics; and the working definition of aesthetics of architecture that I proposed in chapter 2 was used as a criterion for extracting those comments.

Studio A: How to Concretize the Concept—Symbolic Aesthetics

> Beauty is always the result of nonaesthetic, often mundane concerns, such as a quest for precision, truthfulness, sincerity, or simplicity. Beauty that takes a lasting hold of our emotions arises from a full sense of life, with all its complexities and contradictions, not from mere visual imagery or sensory pleasure. True artistic beauty, unlike momentary seduction, projects a timeless and unattainable ideal. Buildings are not just visual compositions; they are magical, mediating structures that evoke and enhance images of life. —Juhani Pallasmaa (2001) (Course syllabus, p. 1)

Of the three instructors observed, studio A instructor used the term *aesthetics* and *beauty* the most during class. He wrote in the syllabus that achieving the Vitruvius triad (commodity, firmness, and delight) was the objective of the course:

> Students are expected to achieve a high level of competence in an interior design project that integrates *Commodity*, *Firmness*, and *Delight*. The projects should reflect thoroughness in attention to *aesthetic* and technical aspects of design including construction, building systems, lighting and materials, as well as application of environment and behavior knowledge. (Course syllabus, p. 1)

Because students had already taken the programming course for thesis studio during the previous semester, the programming requirement had been established and its discussion was not the central issue in the class.

Two unique exercises the instructor introduced were building *light boxes* and making *conceptual massing models*. Light box making was intended to encourage students to think critically of diverse ways to introduce different sources of lighting to the interior space. In the beginning of the semester, students made an 8 × 8 × 8-in. cube with

different methods to introduce lighting, such as direct, filtered, and reflected light. Students were also asked to consider the relationship between the lighting source and the interior surface, thickness, and rigidity of material. After the assignment, students had pin-up time and discussed the pros and cons of their own and other students' light boxes. Students made three different boxes and were asked to develop those ideas in their chapel design. The light box exercise was written as follows:

> Build three boxes that explore lighting effects on their interior. Provide at least one aperture through which to view inside of each box. . . . Choose among four different conditions of illumination.
> 1. Light-space
> 2. Light as an object
> 3. Light from a series of objects
> 4. Light from surfaces (Light boxes assignment description)

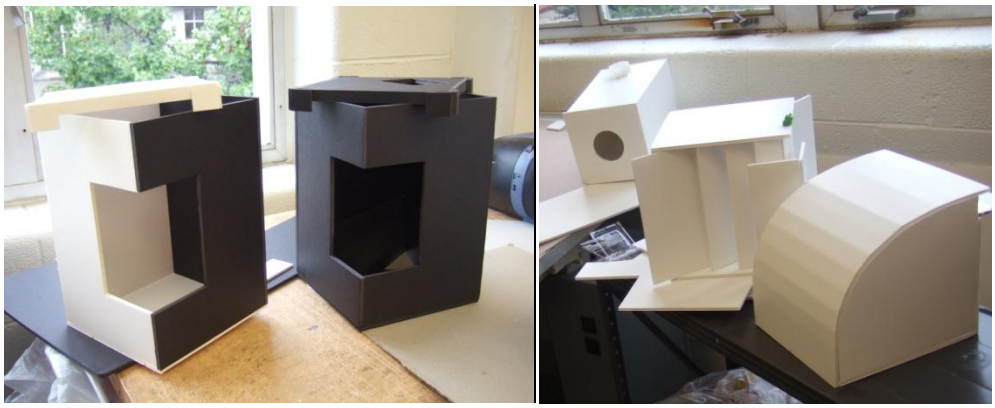

Figure 13. Examples of student work—light box exercise.

The instructor said that the light box exercise was used as a warm-up exercise for chapel design. According to the instructor, because the design topic was chapel, how to bring light would be the central source for chapel design. Light could be used as a surprising source.

Another exercise was to make conceptual massing models. In the second week, the instructor asked students to make three different conceptual massing models from

their inspiration ideas. It was intended to encourage students to think of the design concept, as well as the building design, from outside to inside. The instructor argued that fitting the programming or required square footage is relatively easier than generating the image of the building. The massing model project was described as follows:

> The models should explore the form of the building, which contains the Chapel, its structural materials, an indication of the footprint of the building in the context of the site. Remember that if you have shown the sensitivity required to design something of lasting *beauty* [italics added], you should be able to communicate to others how that beauty is to be realized in three dimensional form. (Assignment 1 description)

He introduced the project during the class:

> Now [during] the first part of semester, in four weeks, I ask [you] to make three alternatives, options of conceptual models that allow you to dwell on the idea of church and to come up with in a sense of form of a church, almost as an object, rather than going to the inside. (September 18, 2008)

The instructor explained the rationale for the conceptual massing model exercise: It was a way to guide the students to approach architecture from outside to inside. Use of this approach came from his long teaching experience, and he used it to lead students to think in more creative and imaginative ways:

> When I started teaching, because of my social activity or social aspects [orientation] of those things [architecture], I was very much into the idea of building from inside out, which is the concept that many of us promote and I think it's right in many cases. . . . Over the years I noticed when you do studio in this sort . . . if you don't pay attention to those things, they [students] deal most of the semester with the floor plan . . . but they never pay attention to how the building will look from the outside. . . . I ask them to develop three conceptual models that are very much the object not the space, then we go inside to test it. In a sense, we create a form that is supposed to be rational because we need to know enough about the container and what it contains, what is supposed to be, but at the same time, I force them to think in a creative way, imaginative way, and to think in different directions, and then we go inside . . . but at least at that time, they are not confined to the floor plan . . . like in some cases in the history of modern movement, people believed that's basically the essence of architecture, if we do everything right and useful, the building will be

> beautiful and evolve to something beautiful in one way or another. I must say that over the years I changed my mind because I don't think it will happen as it is, unless you pay attention to or you have a strong idea to try to accompany [your concept] with some image or some form that will contribute to the stuff [project] you are doing [making].
> (Interview, April 20, 2009)

The outcome of the massing model exercise was a draft version of students' ideas, and students seemed to struggle to develop their ideas in a short period of time. There was an invited review of students' massing models. Through the critique, students decided on one direction among the three alternatives or combined ideas and worked toward a new one.

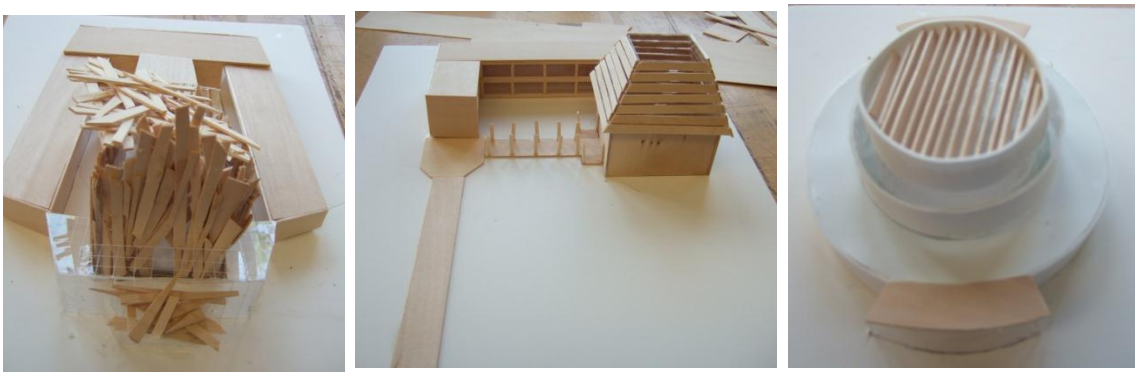

Figure 14. Examples of student work—three massing models.

The second phase of the project was "The Overall Layout of the Chapel," dealing with floor plans, elevations, sections, and axonometric drawings. In this stage, the focus of the student's design moves from object to space. The instructor highlighted the importance of having a clear and strong concept for architectural design at this stage by using Kahn's quote:

> I believe the concept should be equal to that of planting a seed in which the concept—that is, the result you are going to get—should be quite clear. As you progress and develop, the form will be modified, and you should welcome this, because the concept will be so strong that you cannot destroy it. —Louis Kahn (Assignment 2 description)

In addition, the differences among floor, wall, and ceiling were introduced in the project description:

> While variations in texture can give floors specific importance, as a general rule, floors must remain horizontal to guarantee free movement and flexibility of use. . . Walls separate and structure the architectural space, guide our movements, enclose our activities, accommodate us, lead us from one place to another and surround our objects and tools. . . Their modulation, their texture and their ability to display messages play a significant role in determining the character and the atmosphere of a place. The ceiling and the roof provide shelter and act as a counterpart to the floor. But ceilings may accept more metaphysical meaning. Being far removed and most often out of reach, it is an ideal place for the expression of dreams and ideals inside a space. Ceiling design can give meaning to a space. Besides these elements of spatial definition, consider the role of the depth of your spaces, their density, and the openings that guide our movements and link spaces. In addition, consider the geometry, the spatial interpenetration and the juxtaposition of spaces, and the quantity as well as the quality of light and shade in the spaces. (Assignment 2 description)

The floor, wall, and ceiling are basic elements to define spaces. The instructor explained the nature, the usage, and the function of each element; floor as supporting surface; wall as displaying messages that contribute to character and atmosphere of the space; and ceiling as endowing meaning to space and as an element to express designers' ideals. The instructor emphasized a strong and beautiful concept for the chapel design:

> We are moving from object to spaces, from outside to inside. In this situation, you have walls: walls as a configuration, and wall as incidence. . . . Think about it in this way, because what happens to the wall is, you have forces from outside and those are contributing to the way it [the object] looks. . . . The forces from inside . . . try to tell that you need to move here, you need to move this, and you need to contain the aspect of light there. Then, we can talk about certain forces from outside and from the inside. The force from inside is like a program, driving force from program. . . . So when we design from inside out, try to put certain organization, and try to make it functional and pleasing, . . . make the whole building think and run by users, that's a basic requirement. . . . Take a strong concept and a beautiful concept and develop it . . . then this concept will come not only from outside, it needs to be expressive from the inside, from choice of materials, choice of spaces, and choice of

finishes. Basically what you do up to the door handle needs to be based on your concept. (September 25, 2008)

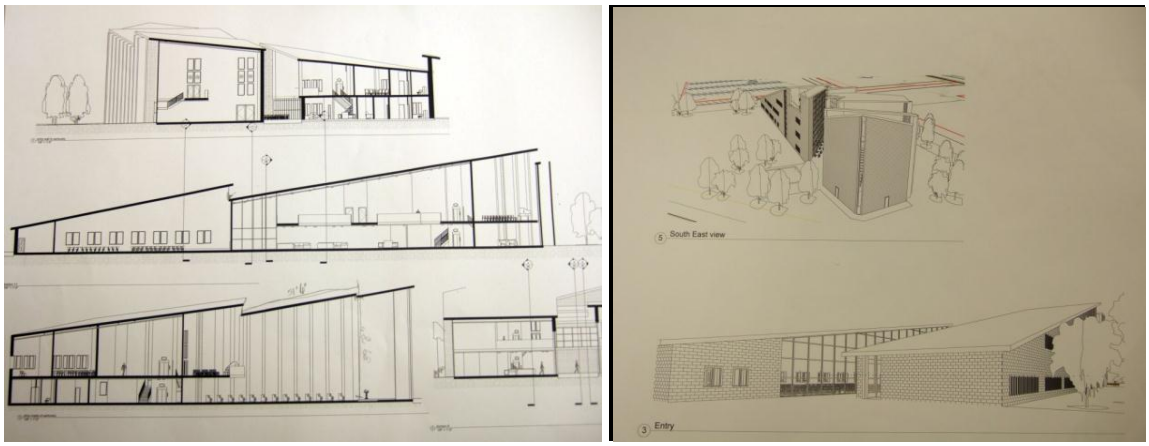

Figure 15. Examples of student work—plan, section, and elevation drawing.

The third assignment was to develop detailed plans of the overall layout of the chapel design. As the final outcomes, students were asked to generate concept/process board, site plan, floor plan, section, elevation, axonometric, rendered perspectives, and finishes, furniture and accessories mounted on a board. It was introduced in the handout as follows:

> In this assignment, you are expected to develop detailed interior design images for a few of the most <u>significant spaces</u> of your Chapel. Focus on the sense of place through the qualities of space, light, color, pattern, texture, objects, materials, and furnishings. (Assignment 3 description)

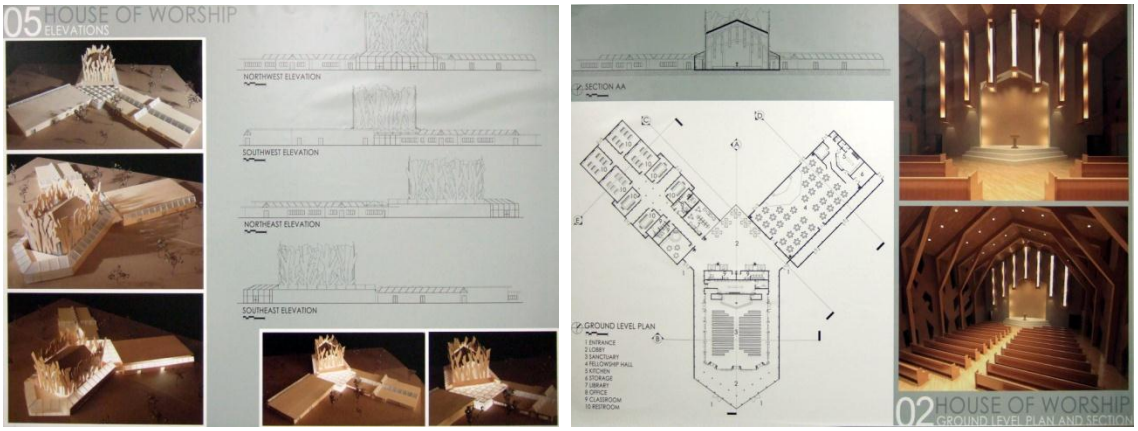

Figure 16. Examples of student work—final design presentation board.

In studio A, the emphasis on using light led students to consider interior quality, and the emphasis on massing models coached students to consider the aesthetic quality from the outside. The instructor believed that students need to consciously consider aesthetics in their designs, so their teachers should pay more attention to aesthetics.

Studio B: A Montessori School: Space and Learning in Contemporary Elementary Education

> The space induces the project. If you have a space, something happens, the program then starts. It does not start before you make the space. —Louis I. Kahn (from syllabus project 1 descriptions)

The emphasis of studio B project was on obtaining the quality of space by understanding and applying the Montessori philosophy of education. On the first day of class, the instructor introduced several guiding principles of Montessori school design. They are Montessori's six key components, Froebel Geometries, Frank Lloyd Wright's principles, and Michel Serres' primary spatial types in Figure 17.

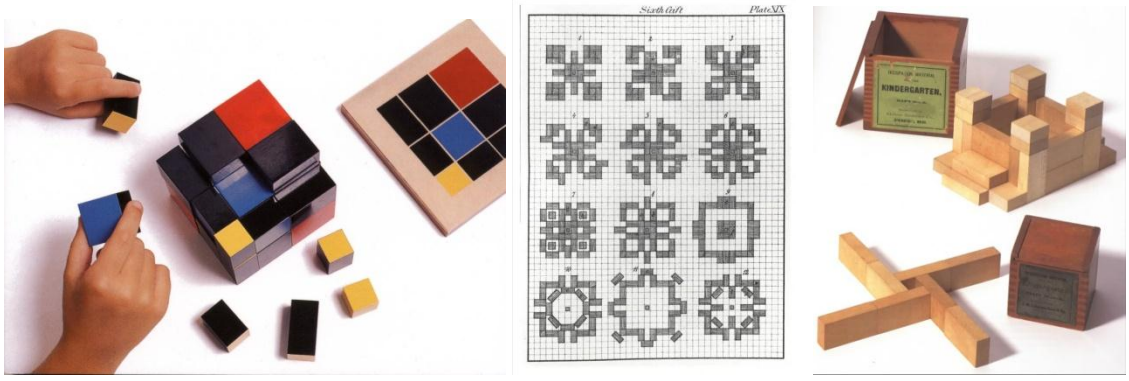

Figure 17. Images of the Montessori Cube and Froebel Geometries.

Note. Reprinted with instructor B's permission (from Project 1 syllabus)

> The Froebel Geometries, developed from crystallography, starting inevitably with the square or cube, and involving both axial (cruciform) and rotational (pinwheel) ordering principles. (from syllabus)

The six key components of the Montessori classroom or environment defined by Maria Montessori are freedom (children's freedom to choose their own activities and environment in the classroom), structure and order (the classroom must reflect underlying structure and order of the universe), reality and nature (materials and construction of the classroom are connected to nature directly), beauty, and an atmosphere that encourages a positive and spontaneous response to life (good design and quality of the classroom), the Montessori equipment (the materials or equipment need to aid the child's psychic development and self-construction), and community life (the sense of ownership and responsibility) (from project 1 syllabus).

The instructor suggested primary spatial types from Michel Serres' book *Hermes: Literature, Science, Philosophy* as one of the ordering ideas for students' design. The seven primary spatial types, as listed in the project 1 syllabus, are the following: well (space of assembly), bridge (space of connection), tower (extroverted space), labyrinth (introverted space), passage (space of movement), cells (serial space), and crossroads (threshold space).

> It's a program type that has yet to be fully realized in terms of its architectural potentials, so we will be looking not only at examples of Montessori schools, but also we are looking at the actual activity of students of Montessori schools. . . . In fact, we will look at the students in terms of mode of education, and how that produces a very different type of classroom space. The Montessori system as well as the "learning by doing" system is based on earlier work, particularly Eduard Seguin's work [geometry]. . . . We will be laterally engaging some of these geometries, which will be the starting point for your sketch project. (January 14, 2009)

The instructor showed examples of Montessori school design and some artwork displayed as an inspiration for the school, such as Mondrian's paintings;

> [Look at] Mondrian's last painting on the right, the "Broadway Boogie-Woogie," which would be used by Herman Hertzberger, one of the

> greatest designers of Montessori schools. Something I feel is a template for the kinds of spatial ambiguities and spatial overlap that should occur in a Montessori school. (January 14, 2009)

He talked about Montessori philosophy;

> It's eventually translating learning, learning by doing, and putting together different parts, also like particularly [the] color play of Mondrian. (January 17, 2009)

In the beginning of the class, it was planned for studio B and art students to collaborate through the semester. The art department professor and his students planned to participate in the studio B students' presentation and to suggest a sculpture design for the architecture students' Montessori school design.

> This architecture studio . . . will work in parallel with an art studio, to be taught by the artist Brown [pseudonym]. The combined studios . . . will meet together at least once a week in a dedicated classroom, and will pursue a variety of parallel exercises, centered on the subject of Montessori education and its precursors (Froebel kindergarten training) and offspring (Reggio Emilia elementary education). (from syllabus)

The first project was "Carving the classroom," which was designing an independent Montessori classroom sized 32 × 32 × 32 ft. Before receiving the actual site, students were asked to develop the cube room, based on Montessori philosophy.

> This project requires you to learn how the Montessori classroom actually works as an architectural space, so that, upon the completion of this first project, you will have produced a personal interpretation of the key element necessary for designing a successful Montessori school: the Montessori classroom. In order to achieve this during this short project, in addition to engaging the program above, you will need to research the Montessori teaching materials and understand how they are engaged spatially by the children in the classroom, as well as how the Montessori classroom employs certain urban conceptions of how people relate to each other in shared space, evolved from Italian urban life. The Montessori materials are directly related to the earlier kindergarten training developed by Friedrich Froebel, based upon the primary ordering geometries discovered in the science of crystallography, as well as the work of J. H. Pestalozzi. (project 1 syllabus)

> In the first sketch project, you will understand the dynamics of single classrooms, and you will have free spatial movement, that's really what draws the Montessori school. Montessori users in the space is a part of it, guess it is closest to the architecture studio; it can be the best classrooms, that is essential to a Montessori school. Then, once you do that, find what happens when you have more than one classroom together. Montessori, there are two agendas. Formal is one, sort of developing the essence, sense of individual and personal understanding, interactive environment, that is very important for Montessori. The second is in-between classroom, trying to tie classrooms; it gives a social notion. But what's to be learned from a culture is . . . the whole idea of having integrated rooms, in a piazza . . . the nature of social space, kind of how you learn to interact with little colleagues, different colleagues through the space of city, which is being as a citizen. (January 17, 2009)

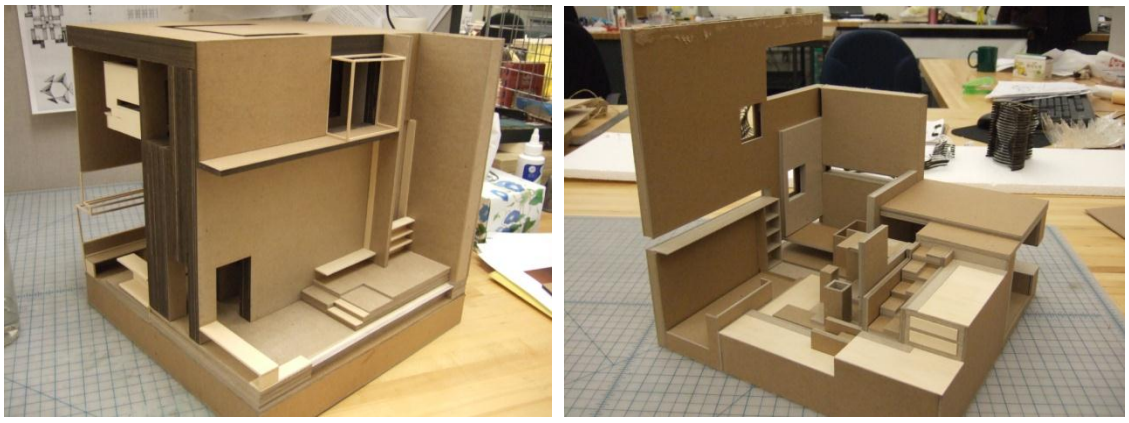

Figure 18. Examples of student work—model of Montessori classroom.

In the first project review, the instructor asked students to explain their understanding and interpretation of Montessori philosophy in their project when they present their design to reviewers:

> It is a strange project, but it is focused on issues of the Montessori classroom, so when you present it, make sure to give the reasoning for the shapes of the spaces, the quality of light, the choice of where you put the garden and all these other kinds of things with respect to what you see as some of the characteristics or aspects of the Montessori educational method. (February 02, 2009)

Another unique approach related to aesthetics was the use of artwork to inspire architectural design. The second assignment was to develop a Montessori school layout

based on one given artwork. At this stage, the instructor gave each student a different artwork as a source of ordering ideas. The instructor said he chose the artwork by considering each student's educational background and design language, as seen in the first assignment. The second project was described as follows:

> Your next "space of work" is a horizontal datum, rectangular in shape with edges at a 90° angle to the cardinal directions. . . . Consider it a work-surface on which you are designing, deploying programmatic elements and spaces "unpacked," "unfolded," or "projected" from your Cube/Classroom project. . . . Consider the interactions between/among the inhabitants of the classrooms, as children move through their educational life in the school. . . . In addition to the Michel Serres primary spatial types, and the Froebel Gifts' geometries, you are each assigned a painting as an additional source of ordering ideas for this project. You are invited to consider the notion that from their beginning, and continuing today, Modern art and Modern architecture share ordering principles and perceptual insights as one of their most fundamental characteristics. (Project 2 description, p. 1)

He introduced the second project in studio:

> Then, in the second sketch project, we will have to do with trying to figure out how a group of these classrooms comes together to make a school. And in Montessori education, the relationship between classrooms is very different from that of a typical elementary school—it's more like the order of a little city. So we'll be doing a little series of studies and look at the notion of how it is descriptive on open landscape, and how one can derive this program. . . . Then, the studio also will be spent making a very high level of resolution of a very small Montessori school. (January 14, 2009)

Figure 19 shows examples of artworks given to three students, and Figure 20 presents examples of the second project produced by the three students.

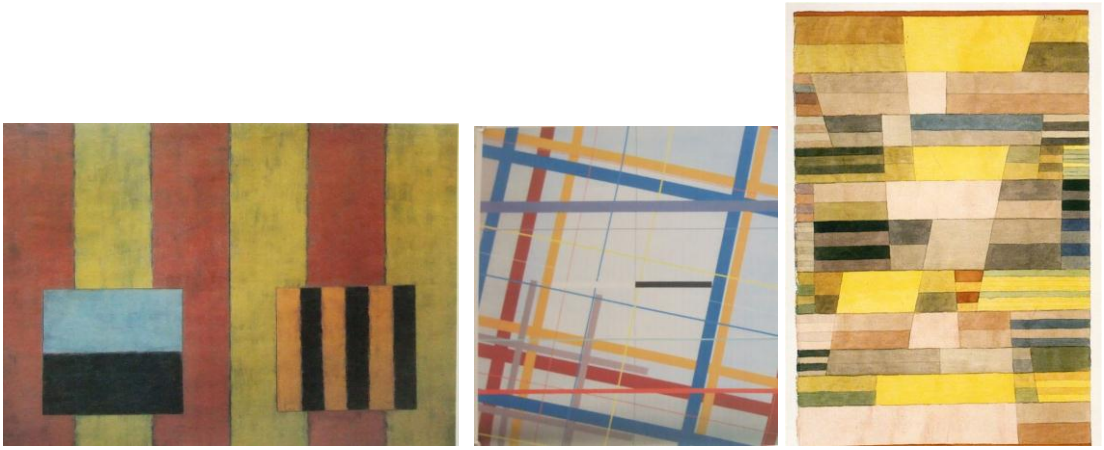

Figure 19. Examples of artwork given to students.

Artist name:	Sean Scully	Robert Slutzky	Paul Klee
Student name (pseudonym):	Drew	Emily	Flora

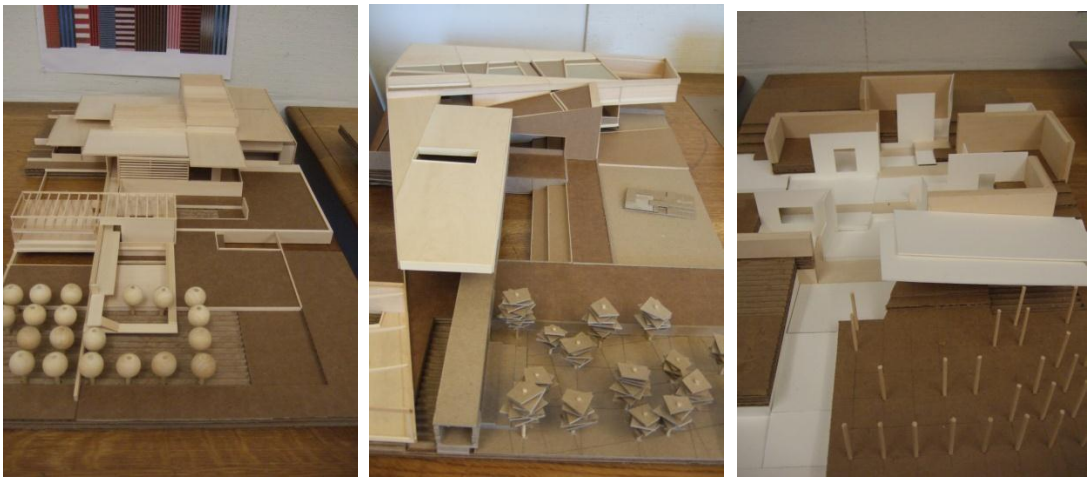

Figure 20. Examples of student work—the second project.

Student name (pseudonym):	Drew	Emily	Flora

Studio B instructor explained the rationale for giving artwork to students as follows: He believed an ordering principle is shared between modern art and architecture. This idea reflects the practice of Bauhaus teachers, who taught principle and ordering ideas of art to architecture students and introduced exercises using principles of art in

architecture. While showing examples of Montessori school and modern paintings, the instructor talked about the potential of a painting as it relates to architecture:

> This painting ["Broadway Boogie Woogie" by Mondrian], in particular, has enormous architectural potentials. . . . This is one of the Montessori Schools, and they are spatially and perceptually different sizes . . . so the training is actually in all senses, including weight, not just simple touch and textures, but also relation between core and space. (January 17, 2009)

The third project was to design a Montessori school at an existing site near the university. At this stage, programming for the school was given to students. This assignment started after the spring break, following a field trip to the Netherlands in which the instructor and students visited a number of Montessori schools including some designed by Herman Hertzberger. It seems that through the field trip, the students and their teacher developed a common understanding of the direction for their Montessori school design.

> You now have the specific program of use and spaces for the Montessori classroom (Project 1: Carving the Classroom), and the program for the collective spaces, interior and exterior, of the Montessori School (Project 2: Etching the Earth), made up of five classrooms for ages 3–12, 24 students and two teachers per classroom for a student population of 120 and ten teachers, plus a school director. You are now to design the Montessori School for a site in College City [pseudonym]. (Project 3 description, p. 1)

> And while this project concludes now . . . and there will be another one of similar abstractness of a different character, and then we will launch, you might call, the real project. And by that time, a lot of things will happen to these projects. They will become parts of the working vocabulary of how we look into the real size project with a series of ideas. (February 2, 2009)

The last project was to develop details such as sections and materiality of the Montessori school design and prepare for the final presentation.

The other unique approach of studio B was that the order of the four assignments was somewhat different from the typical architectural design process. The instructor's

approach was to design space from inside to outside. Usually, the architectural design process moves sequentially through the following stages: programming phase → schematic phase → preliminary design phase→ working document phase → construction phase (Salvadori, as cited in Lang, 1987, p. 39). This approach moves from a big picture to details, and the site analysis tends to occur in the beginning of the design phase. In contrast, studio B instructor emphasized understanding the quality of a small space (classroom) first and then proceeding to spatial relationships, followed by site analysis to develop the whole building design. Studio B instructor talked about the rationale for this approach as focusing on the quality of interior space and experience:

> Rather than introducing the typical kind of site, rather than starting at the small scale, we're going to start at the large scale. We'll start with classrooms and we're going to start with a site that is defined by you, purely interior space, using examples from some of the other studios and programs. (January 14, 2009)

> I think a terrible mistake we make, architects in practice and also in teaching, is that we give programs and site, then student start with a little sketch and as the semester goes along, you will figure out "I don't have time," and that's exactly how a lot of studios work in the world. (January 17, 2009)

Other reasons for that approach were to let students think about the specific quality of specific space and things, such as material, door, and windows, and believe their first intuition in the design process. It seems the instructor does not think that architecture design should start from site analysis, but instead that architects need to bring some ordering idea to the site.

> Normally in architecture you are given a program, a site, and you start to make little tiny drawings for a big building, and they get bigger as the semester goes along. . . . I do the opposite: I start with one room that's really big, but just one room, and then we might go back to the small scale, but the point is the architecture doesn't work in that way. I think good architecture doesn't start smaller and then just slowly become

> bigger. . . . I like the idea from the very beginning, that you think specific things, such as what's the material, how you make a door, how you make a window—at the very beginning because if you wait until the end, you are not free in the end, and because too many decisions [are] made up to now, we don't know where the door is and what else has to be. . . . So one of the reasons of the sketch project is to get people a very limited, but challenging, set of things down to grapple with, and also make them a little bit more confident in their intuition, because I think intuition is very important. I think the very first idea is often really very good . . . the idea, sort of the vision you have about a particular place or a room, or even a quality of life is a very good starting point, and students tend to have that but they just get rid of them, but you can't have them if you give the whole program, . . . But in the end, when people occupy the building, it is the door and window, door handle, and the material that makes the experience, that's what people remember. They don't remember the shape of the room, they don't remember the plan. (Interview, January 21, 2009)

Even though there is no standardized or correct design process, moving from big picture to small detail (e.g., site to floor plan, elevation to material, and exterior to interior) is a conventional process in architectural design. In addition, because the instructor placed much emphasis on understanding Montessori philosophy, it seemed there was not enough room for students to explore their own design concepts and reaction to the site. The period to consider the actual site was short because students spent two thirds of the semester on assignment 1 (developing a classroom) and assignment 2 (designing a Montessori school layout inspired by an artwork).

In summary, studio B instructor emphasized finding an ordering principle within an artwork and reflecting that principle in students' architectural designs. In addition, before trying to find what the site or program communicates to students, he wanted students to have their own ideas for governing the site; an idea that can come from study of artwork and from readings of architectural theories and Montessori philosophy. Thus, students' design concepts seemed to originate from the teacher's visual input and theoretic ideas. With the first project, the instructor led students to think and contribute to

create spatial qualities in interior space. He provided ordering ideas and methods to develop such qualities in interior space.

Studio C: Learning by Doing—Structure and Pin-ups

> Order does not imply beauty. —Louis I. Kahn
> Words are his sails . . . the way they are set turns them into concepts — Walter Benjamin (Course syllabus, p. 1)

Studio C instructor was one who did not use the term *aesthetics* or *beauty* much during the whole class. It was the first graduate core studio of the Master of Architecture program, and the majority of students were newcomers with no previous training in architecture. The emphasis of studio C was for students to become familiar with the architectural design process:

> This course emphasizes the design relationships among people, architectural space, and the environment. Issues of shelter, light, sequence and threshold are considered in relation to physical, psychological, and sociological factors. (Course syllabus, p.1)

> My biggest goal is to get the students to start learning from each other as quickly as possible, then they start to develop passion about architecture, whereas if they are just trying to do things to finish the project, the way the instructor wants or something to get a good grade, then . . . those are good motivations, but in the end it has to be students. They spend lots of time; they have to enjoy talking about it with their peers. (Interview, July 1, 2009)

Almost daily during the first third of the course, there were small assignments such as sketching, analyzing, and model making of precedent buildings. One of the precedent buildings used was Louis Kahn's Kimbell Art Museum. Louis Kahn was an iconic figure, a world-famous American architect of the 20th century. Students were asked to sketch Kahn's buildings, analyze the floor plans, and make models of the Kimbell Art Museum. After such exercises, students started their final projects—designing a car exhibition space as an addition to an existing house.

The instructor introduced the Kimbell Art Museum and Kahn, as well as his timelessness in architecture:

> I am going to introduce an architect named Louis Kahn. He was a pioneer of modern architecture during the latter part of modernism. We think of his predecessors as Le Corbusier, Mies van der Rohe, and Frank Lloyd Wright. He [Kahn] falls after that, but he does it with someone who has traveled through the world and has looked at ancient architecture from Greece and Egypt and castles in southern France. It made him explore heavy masonry to concrete as opposed to thin metal membranes. . . . He arrives at a time that we call "timeless approach to architecture"—all it is, is contemporary. It uses things that evoke things from history and the past. (June 9, 2009)

Figure 21. Louis Kahn's Kimbell Art Museum in Fort Worth, Texas.

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One unique approach that related to design education and allowed discussion of aesthetics was having frequent pin-ups. The instructor used pin-ups as a way to show essential aspects of a project and universal values prevalent among students. Students posted their sketches, site analyses, conceptual sketches, and initial solutions for the design project and presented their thoughts and ideas to other students and the instructor.

In the beginning of the semester, students seemed nervous about speaking in front of the whole class, but they said they became accustomed to pin-ups over time.

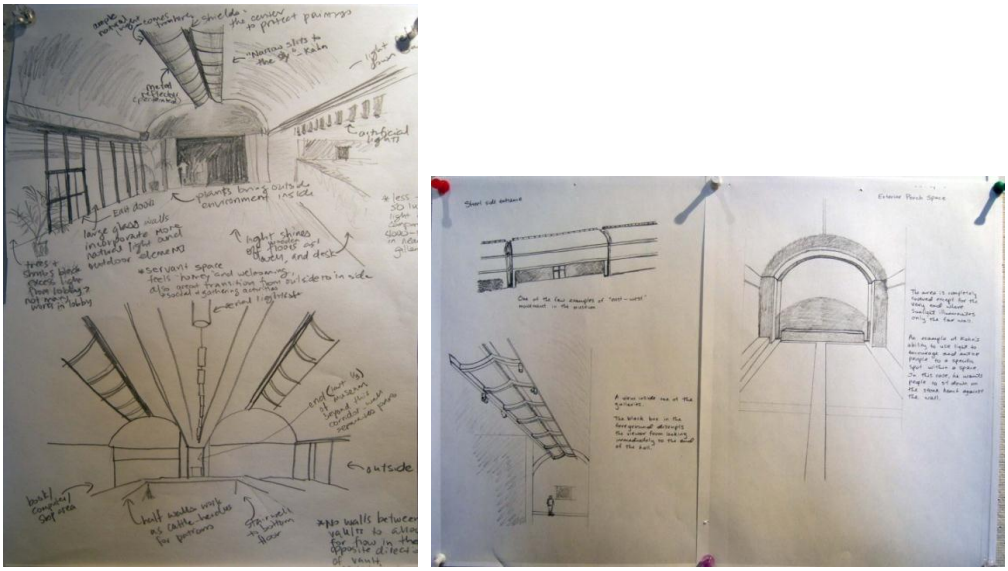

Figure 22. Examples of student work—sketches of the Kimbell Art Museum.

In the third week, students were asked to display their photos of the Kimbell Art Museum models and their analytical drawings of the museum. The instructor asked students to choose well-composed photos with positive aesthetic qualities that showed the models well and asked them to explain the reason for their choices. This exercise aimed to let students to see commonalities among perceptions of good photos and the aesthetics of the photo project. Students tended to give high points to photos with the following features: different elevations, abstractness, a focal point, contrast between the models and the background, a shadow effect, and sequential movement within the museum. The following are some of the students' comments:

> I have interest in this one, because of the idea of different elevation changes, depth. Over here, it shows the triangle better, nice shadow and outlines modules—I like them.

> I like its nice angle. Maybe because of the level of detail this person has; it's unique. My first reaction is "Oh, what a great idea to have shadow down over the vault, put in a whole different level."
>
> I like this one because it looks like the human perspective; it works very well in sequence. And this one, specially look down and set down because of the geometry of the building, it's artistic. (June 24, 2009)

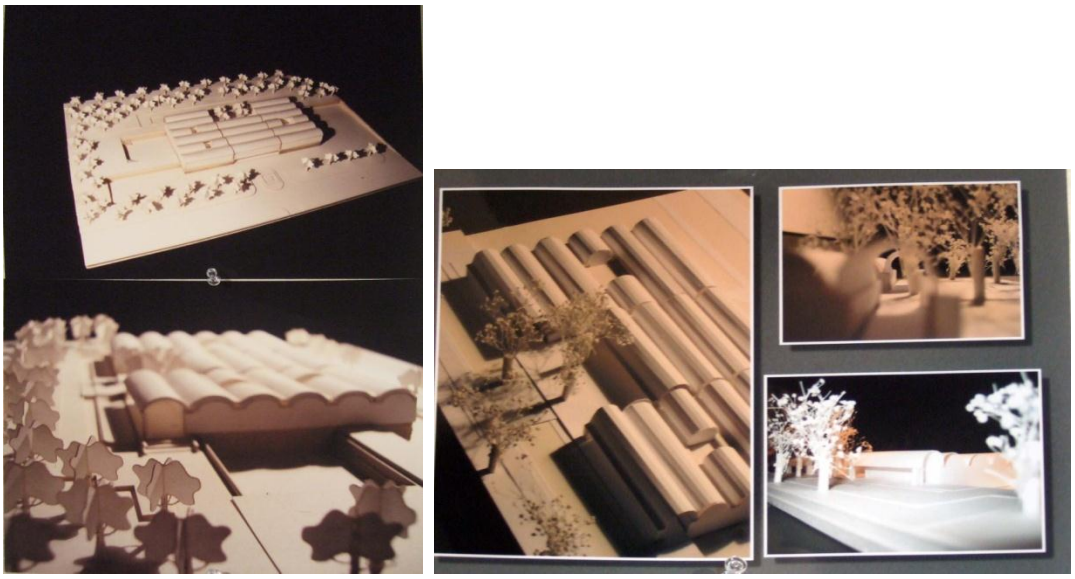

Figure 23. Students' photos of their models of the Kimbell Art Museum. (These two student works were rated highly for quality by students and instructor.)

The instructor explained the rationale for frequent pin-ups: It is a way for students to learn from one another and realize the universal essence of architecture, including aesthetics.

> I tend to try to use pin-ups as a way to identify things that are strong, so in case of proportion, when I see a good example, I praise highly by drawing more attention to with my finger, and refer back to it many times through the conversation. (Interview, June 17, 2009)
>
> I am assuming that this is extremely useful rather than having just desk crit, which is also useful to a point, and I imagine . . . there are similar strategies or similar struggles here [pin-ups], that's why I think it's really useful. (June 22, 2009)

The instructor talked about the benefit of pin-ups as amplifying students' skills:

> In a large group pin-up, its main benefit is to have the entire studio come together in terms of common terminology and to have a hive mind, in the sense that if five different people look at one site, they make five different approaches, but chances will probably come up with some that overlaps and speaks to the essence of site, so if everyone in the room is working on the same project, and they may hear what other people are thinking, then the chance of getting to the best solutions radically increase. . . . I like to provide [an] opportunity for them to use each other to amplify their own skills, and in an introductory studio like this one, it gets everybody more quickly acclimated to "Okay, this is the kind of drawing," and when you see a good drawing in the wall, it's hard to say, "Wow, I don't like that"—instead we have to say, "Wow, I wish I could do that." When they see it, and if you say this is a good drawing, then they know what the target should be quickly. (Interview, July 1, 2009)

The other unique nature of this instructor's class was that he did not use many visual materials; instead, he inspired students verbally with his descriptions. The reason for not having many visual materials is that he wants to have an open course structure rather than a too-prescriptive environment.

> I like them to have to translate my words into their own pictures . . . because they have all different backgrounds, some from rural, some suburban, and some from more architectural history background . . . if they can find their own relationship to what I am describing, it may not be the great example that they have in their head but at least it's tangible, and they can think about it in terms of materiality and how it made them feel, and I think that makes it better when they actually look at something like the precedent study, like the work by Kahn, the Kimbell Art Museum, because they don't just look at it neutrally, they start to look at it based on their own catalog of information, . . . and they get something out of it, and they mix that with their own experience, and that starts to become what they are about, and so that's why [I prefer to describe verbally than showing too many visual materials]. (Interview, July 1, 2009)

The final project was designing a car exhibition space titled "Housing a Private Car Collection." The project was described as follows:

> The studio task will be to create a facility to house a small collection of important and thus valuable and aesthetically interesting vehicles. As a private collection, the facility will be located adjacent to, and become an integrated part of, the existing residential site on College Parkway [pseudonym] . . . . Please recall that our time studying and modeling the

> Kimbell Museum by Louis I. Kahn and drawing the various paths of movement (parallel parking, backing up, tuning, etc.) of the typical automobile will all play a role in the design of this building/landscape/site. From the Kimbell we will take the ideas of the repetitive module and vaulted space, servant vs. served spatial ordering, the articulation of structure vs. infill. (Project description)

During the final project, students were asked to produce sets of drawings and modelings, such as a floor plan, elevation, section, section model, and physical model of their designed building. The instructor emphasized understanding building structure through model making with materiality, tactility, and structure of architecture.

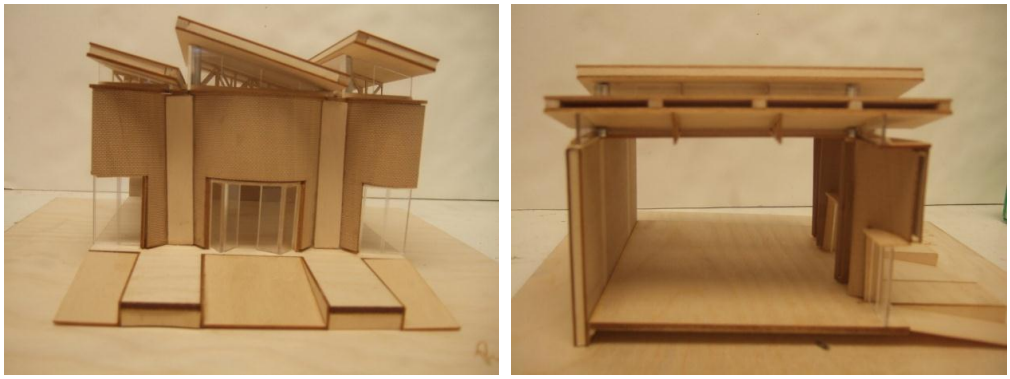

Figure 24. Examples of student work—section model.

For the final project, the instructor required students to use Kahn's idea of having a module for their car exhibition design project:

> So in this abstract study models . . . anything that you place on the site, as a series of modules, get the essence of module or cell. Or if you can't do that, have some time to look at the Kimbell Art Museum. I don't care whether the cell is curved, S-shaped, L-shaped, or completely straight, but you should think about it as a cell or a module. (June 16, 2009)

Figure 25. Module used in Kimbell Art Museum

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In addition, he suggested considering an existing building's materials and façade for the car exhibition design:

> I think it's interesting that the building has brick, stone, and wood in the corner and is very detailed in inside, but I think the character of this building is the fenestration pattern and shutters . . . they [shutters] provide a kind of punctuation, to get a scale . . . if you can, start to think about the pattern. . . Also there are a lot of contrasts in color schemes of that house. [One] tends not to see it because it is red bricks, but it's been there for a long time, and it still has punctures. So that contrast is supportive. It's not trying to be an accent, but it's contrast, So without replicating that form, think about it. We can also think about the larger big drum or cylinder. . . . Break up, otherwise a long simple form. . . . I also want to talk about this, that existing wall; that seems to be a signature, which wants to be used as a lot of things, justsegregating the site or connecting elements to make a larger hall. (June 16, 2009)

In summary, in studio C, pin-ups were used for design education but also for teaching students about aesthetics. By studying Kahn's building, students learned vocabulary and ordering ideas in the Kimbell Art Museum, and they delved into the

possibility of using a modular concept for their own project. Through that process, students seemed to open their eyes and to see beauty in the museum design that they did not consider beautiful before.

Instructors' Education and Teaching Philosophy of Aesthetics

Studio A instructor received his architectural education in the 1970s in a Middle Eastern country. The education he received was mainly based on the Bauhaus because most of his teachers were strongly influenced by that school. After practicing architecture in his country, he came to the United States and earned his Ph.D. in architecture with emphasis on environmental gerontology. He said he did not receive enough education in aesthetics. He recalled:

> My teachers were students of the Bauhaus, and for them the whole idea of talking about aesthetics was [only] talking about specific history. . . . Almost all architecture was supposed to be functional and programmatic, and beauty was supposed to jump out of nowhere . . . . There was very minimal discussion on aesthetics. (Interview, September 19, 2008)

He said he was self-taught through his practical experiences:

> So I think most of the aesthetics that I have been with is self-taught for developing my understanding of what beautiful building should be about. (Interview September 19, 2008)

Through massing model exercises, he helped students think about aesthetics before function and develop images of their buildings.

> I force them to think about aesthetics before they touch the function. Conceptual model is very much of massing, aesthetics, and ideas that accompany with those things. I am a great believer that if you have a great idea and combine it with a certain visual image, then it already has aesthetics. (Interview September 19, 2008)

The rationale for the approach from outside to inside was to guide students to spend their energy holistically to develop floor plan, section, and elevation as well as to achieve high quality of design:

> It's little bit reversed; it's not designing from inside to outside . . . because over the years, I saw students deal with floor plans in the beginning—many students don't go beyond this. Basically, what they did was manipulating floor plans again and again in every possible direction for the whole semester, and at the end of semester, when I ask them "Where are the section and elevations?" Then, they basically extruded the floor plan, put a cap over it, and it was over. It was quite disappointing. (September 18, 2008)

Studio A instructor said one of his teaching philosophies involves caring equally for strong and weak students and helping them elevate their level of knowledge. He said he had a high expectation to students and helped them achieve that expectation.

> [I work with] the strongest [students] . . . from time to time, to help them to get direction or in a sense to encourage them, or stimulate them to a certain direction, but the weakest students, those who are not necessarily able to do so good, and this is the biggest challenge. . . . I would take every student in this class and try as much as I can to relate to his or her ability, and it's very difficult in some cases. I try as much as possible to carry them and help them to accomplish in the level where they are. I think it comes from my background . . . in the place I lived, in my country, it was always based on the notion of equality of human beings. (Interview, April 20, 2009)

The examples he used for studio teaching came from his work experience, frequent travel abroad, and sources from additional lecture courses he had taught:

> I am trying to . . . educate myself. Most of [the examples in] my classes are based on my visits to different buildings in the world and my own experience of different cities and different environments. (Interview, September 19, 2008)

The instructor of studio B received architecture education in the early 1980s in the United States. His undergraduate program was in an interdisciplinary environment comprising cross-domains within the College of Design. He said he was satisfied with his

undergraduate education because he learned a diverse range of art and design related aesthetics. His teachers' instructional methods regarding aesthetics showed the Bauhaus influence in many areas.

> For the first two years, we didn't choose a major. We had to take master courses from graphic design, urban design, architecture, landscape . . . and then at the end of 2 years, you decide you will be an architect or furniture designer or whatever, so the whole first year studio was all very Bauhaus based design principles that would cover all the arts, which obviously aesthetics completely messed with all the academics, I mean all based on Joseph Albers' work which is still something that I use. Albers, and Paul Klee . . . Paul Klee's work *The Thinking Eye* is clear about how you train your eye to understand rules of the visual world, and then Albers . . . takes it one step further . . . and talks about how you train people to understand the capacity of materials, but the idea came from the Bauhaus. It's amazing . . . so I would say I was lucky because there was still the idea of Bauhaus. (Interview, January 21, 2009)

The fact that he received the Bauhaus type of education seemed to influence his current way of teaching because he also presented the exercise to use art in studio B. He said many of his undergraduate teachers learned from Joseph Albers and Paul Klee, artists who were teachers at the Bauhaus. Paul Klee's book was on the reading list for the studio B project. Studio B instructor said he tries to give customized feedback to students and use different teaching strategies for each student. He mentioned that he handled gifted and weak student differently:

> I use a different strategy for every single different student . . . sometimes they [gifted students] can go [in] a very wrong direction because they are so certain about doing things, so it's very difficult to have a conversation with them, whereas other people seem very tentative. If you ask them [weak students] to do something, sometimes they have great courage to do anything you asked, because they trust you to help them, so I find sometimes so-called weak students may be not so strong designers but make the most exciting projects. (Interview, April 29, 2009)

Because each student has different abilities and is in a different developmental phase, the instructor used different methods for each student. He said that was the delight

of teaching architecture, a line of thought that corresponds to Montessori teaching philosophy:

> Actually, I speak with every student slightly differently. That makes studio more interesting because we can't treat everybody in the same manner. (Interview, April 29, 2009)
>
> Montessori is about letting each student move little bit about on their own phase, not by measuring against the other students, so I always emphasize that I want each of the students in studio has his or her own personality . . . because each of them is a different designer. (Interview, April 29, 2009)

Another strategy was to boost students' interests in using unique approaches to design projects. He explained why he did not give a programming list to students at the start:

> That's how to go this semester, but you know it is also the way for me to let the students learn about the program through making things, rather than learning as a series of words on sheets of papers of square footage. So for me, it's very important because I think the program is always suspicious, the client can control program—you should not really take it very seriously sometimes. (Interview January 21, 2009)

Studio B instructor's teaching philosophy for aesthetics was to let students realize the experiential quality of space rather than the look of the buildings.

> For me, aesthetics . . . I can't separate it out . . . it has to do with sort of complete elegance of building. It also has to do with the fact that, as Walter Benyamin said, architecture is best appreciated in the state of distraction. Architecture is not the object of attention. We don't look at the building, and we don't look at the architecture; we perform. . . . As Alvar Aalto said, it doesn't matter what the building looks on the day when it [the building] is open, what matters is what it is like to live in 30 years later, and whether it is still a good building where people like to live in. (Interview, January 21, 2009)

The instructor of studio C received undergraduate and graduate education in the late 1980s and 1990s in the United States. He described his education:

> The kind of '70s modernist rationalization about a certain discipline and minimalism just started to fade out or closed down when I was an undergraduate, and now I think 10 years ago, there was a different school.

> . . much more expressive and flamboyant and kind of reacting to the other, and right now, I would say they are loosely merged. (Interview, July 1, 2009)

He reflected two influential instructors that he had in his education:

> When I was in undergraduate, he [the instructor] opened up my mind to what I can do with architecture. He allowed me to pursue kind of odd ideas, it was a museum project for space artifacts, . . . and I was very interested in ancient technology, that most of people think that the ancient didn't have technology because they didn't know how to use it, and he was very open to developing my own thesis about it, and that opened architecture up to a kind of personal interest of my own, and I started to see that there are several other architects who do similar things or think in that way. And at the same time, he didn't force me to make anything look a certain way, and we would mostly just talk and he would point out about things that were awkward and they would be resolved. And I guess the nemesis of his way of thinking was in graduate school—the professor, a man with very few words, but very abstract and very encouraging in the sense of quirky odd process, and the process would ultimately yield something. You just kept working with it and you didn't try to figure out where it was headed too soon, so it was much more artful than I was taught in other [studios]. So I think the merging the two mentors; that's kind of how I started to approach studios. (Interview, July 1, 2009)

Regarding teaching methods, Studio C instructor said he used the first part of class for discussion and the second part to let the students work at their own pace.

> The project would be different [per studio], but the method of having a lot of discussions about architecture or buildings up front, and then the students working on things and looking at past projects, whether that's a piece of furniture or building, and then using that to help them to understand certain things—they are similar. (Interview, July 1, 2009)

The three instructors seemed to be influenced by their past teaching and work experiences, and influential professors they had met in their studies also played a role in shaping their current teaching pedagogies and methods of aesthetics.

Customized Aesthetic Education Observed Through Six Student Cases

This section discusses customized teaching methods regarding aesthetics as observed through six student cases. Whereas the previous section described the studio structure, culture and environment, and emphasis on aesthetics observed throughout the studio, this section deals with how aesthetic discussions actually occur between student and instructor during desk critique. This section reports the analysis of discussions between instructor and student, as well as how student design evolves through student-instructor interaction. Two students were selected from each studio. All student names are pseudonyms.

Case 1: Anne's Chapel Design—Aesthetics Reside in Concept-Form Relation

Anne was a female student in studio A. Her concept for the chapel design was *journey,* which came from her idea that following the Catholic faith is a journey. She described her concept as follows:

> My concept started from being a Catholic, so I was trying to think of something in the Catholic faith that we don't really harp upon but is really important. So I came up with the idea of doing something . . . with the seven sacraments. And I broke them down into three different parts, sacraments of healing, service, and initiation, and that is how my idea started out. From there, it evolved to thinking about how the sacraments of the Catholic faith are kind of a journey. You start out with baptism and then end with the anointing that is basically, your last rites and so, I really wanted to play with the idea on how faith is a journey within the Catholic Church. (Anne, October 23, 2008)

Anne wanted to express three of the major sacraments (sacraments of healing, service, and initiation) in her chapel design.

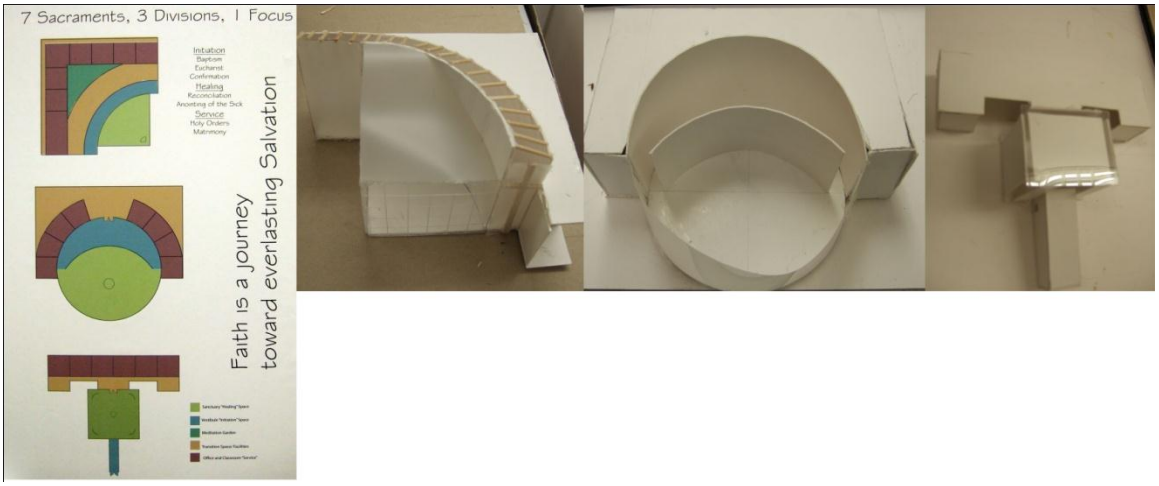

Figure 26. Anne's three basic massing models and plans.

Anne's three massing models, as seen in Figure 26, were overall large and heavy chunks. The first massing, the L-shaped one with an array of rooms, was very symmetrically organized. The second one was again symmetrical, arranged around a big circle hall. The third one, T-shaped, had a long corridor but again was symmetrical and overall volumetric. The instructor articulated that the concept of "journey" connotes linearity, saying that the elements (such as the three sacraments) should connect along a path and the design needs to use a consistent visual language. In this comment, he suggested to Anne that, when she wants to connect several elements together with a path, it is better to give those elements similar characteristics than to give them dramatically different forms in order to achieve better quality of space:

> In my mind, the journey of something expresses that you can do it either spiral or it's almost some kind of . . . some kind of linearity. Each one of those stages . . . they don't need to be so different like three animals, one giraffe, one monkey, and one zebra. It doesn't have to be three animals in a sense of connecting this corridor. (September 18, 2008)

In the first critique, reviewers pointed out that Anne needed to find a way to match concept and form (journey and chapel, respectively), saying the path or journey

gives an impression of different experiences with different forms. The instructor suggested that Anne develop a space that creates a hierarchy within the idea of destination:

> I think it is a missed opportunity. . . . The most important aspect here is in what is the hierarchy of it, why you have to have journey inside to allow you work in there. The idea of journey itself is, I think, very usable and sensual—and in journey, there is some kind of destination. We may say that the last destination is not very important . . . the overall is destination . . . so assume that there is some kind of destination you can reach, in a sense that where you enter and go through. The way you organized is very axial . . . if you go another way, you can get the school. You miss the opportunity which compromises the journey . . . I am not so sure yet about which one you would like to be. You make your decision, but still it is not there. The expression of the school over there is, you have to ask yourself, how to relate those things adjacent in a beautiful way to the site. (September 18, 2008)

He pointed out that Anne's chapel is very axial in shape. For Anne to better understand and identify a journey for her design, the instructor described two approaches to a journey—one is axial and straight, and another develops organically, like an Italian hill town:

> A few things in regard to the journey. One journey is very axial and straight . . . in Paris . . . think about stations you go to [along the] Champs-Élysées and understand what is coming on. . . . Let's say there is a certain boulevard, certain piazza, certain masterpiece, enormous column. Then you slowly, slowly walk into the courtyard and squares. The journey itself is very axial and very dramatic; as it evolves over the years . . . Axial architecture is a very significant journey. Take another journey from this discussion. You see the Japanese temple; I suggest you take a look at it. It starts from a *torii*, which is a gate, very strong point. You continue going, usually climbing steps to get to those things; that is a journey which is mystical . . . Those are very axial, straight, that you can see all the points before you get ahead of it . . . it's a very important aspect you try to develop the opportunity . . . the last journey I will describe is the journey of the Italian hill town; which is described as a solid beauty. Towns all over Italy . . . it is not something somebody designed; it is always toward to the end or to the top. (September 18, 2008)

Anne struggled to figure out her understanding of the concept of journey by considering other people's comments and interpretations, as well as to find a way to match concept and form. It seemed there was a *symbolic* and *meaningful aesthetics* whereby people expect a concept to lead to a certain matching form.

> I wanted to do something with different levels and different heights of the buildings, by going around and also coming through here, and having narrow passage ways and opening spaces. Then, each one of them branches off different ways—that's how I want to show the journey—so there is a pathway, but you can also go this way and that way, because a journey is not a defined way. (Anne, September 25, 2008)

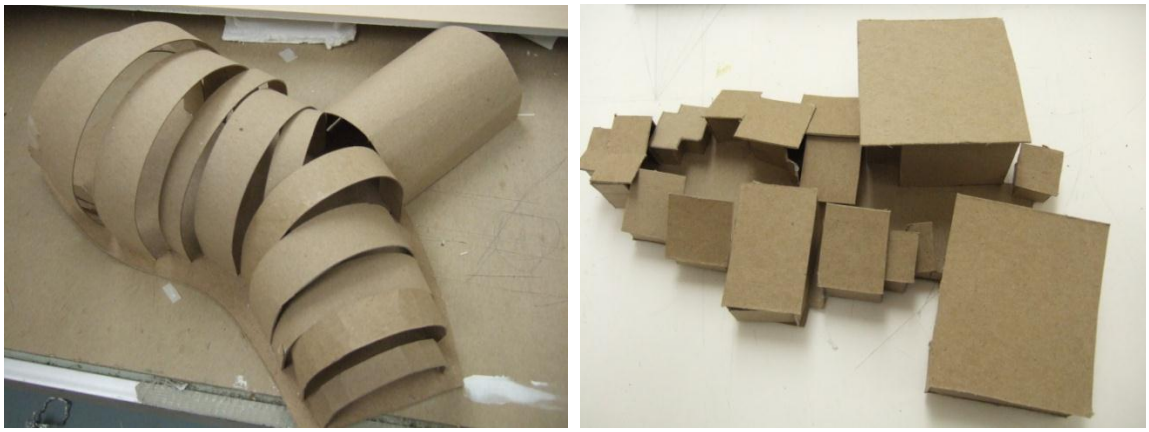

Figure 27. Anne's developed massing models (left: first change; right: second change).

As seen in Figure 27, compared with Figure 26, Anne's massing model changed from an immense, closed structure into a shape with a slightly irregular path and with some changes in the size and position of rooms. The instructor helped Anne to develop her design aesthetically by articulating the concept and providing feedback about using design elements such as hierarchy, axis, destination, edge and anchor point, and light. He helped Anne to develop her chapel from a too-simple and monotonous experience into something with aesthetic quality in the experience of each sacrament, with hiding and revealing of space, different ceiling heights, connection of nodes in a consistent way, and

changes of angle. He played a role in helping Anne to translate and embody her idea aesthetically into architectural form.

When Anne's project did not develop according to the instructor's expectation, he encouraged her to go deeper into it:

> Okay, investigate much deeper into it, because as it is, it's not clear. I can see what you are trying to accomplish here in those hidden places, and I am ready to take a look at it and see it. (October 7, 2008)

He pointed to the mix of languages and palettes in Anne's design and suggested using the same design language to obtain better aesthetics:

> Because this is such a sacred form, such a closed form, if you suddenly cut it with such an angle there, it speaks a completely different language, like it came from a different family. So that's something you would like to be sensitive to. (October 16, 2008)

He also explained the principle of standout and making one part unique:

> Perhaps all these are one material, perhaps all of it is brick, and if it is a totally different material like metal, it will be more prominent [with] some kind of metal over it . . . . If you want to make this one very unique compared to all those, we talked about that here it is repetitive and here it is unique. . . . If you take this building and tilt it 5°, 10°, something of this sort and break away from it, suddenly the whole thing becomes unique. (October 7, 2008)

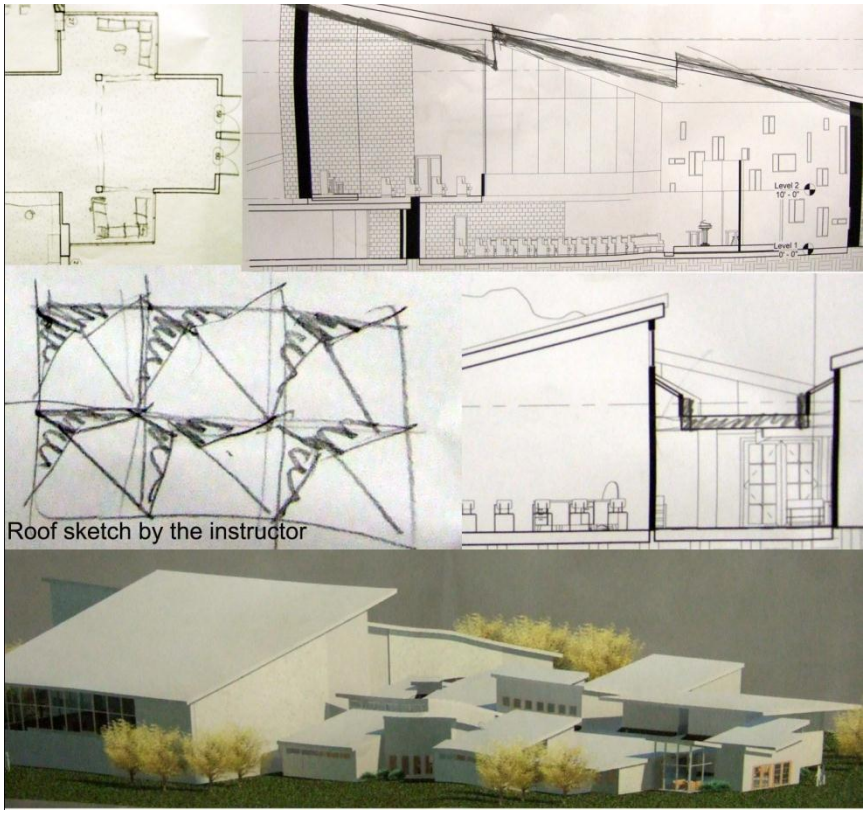

Figure 28. Anne's roof design change and instructor's sketches regarding the roof.

The instructor suggested manipulating massing for a better aesthetic appearance of the building:

> Would a separate roof break up that monotonous appearance? So work on those things and the manipulation of the massing can lead you to do something very nice. . . . I'm just giving you the principles of those things, so now you need to start working on it. (October 16, 2008)

Regarding Anne's roof design, he suggested considering the way the roof is projected and breaking the big mass into small-scale roofs (roof sketch 1 in figure 28):

> The other thing is the appearance, also on the roofs. Do you want them to appear as if they are hats sitting on the things? Or do you want them to be kind of swallowed into those forms? . . . That's an important aspect where you need to make a decision. . . . If you want to have projections over there, if they're projected, how much are they projected? If it becomes part of the character, I call it the aesthetic aspect of your architecture. . . . They become part of the appearance, part of the way the building reads from the outside. It's not just a coincidence, so the projections you have on the roof

> are opportunities. . . . It's an opportunity because it has some sort of appearance aspect that you would like to capitalize on. (October 16, 2008)

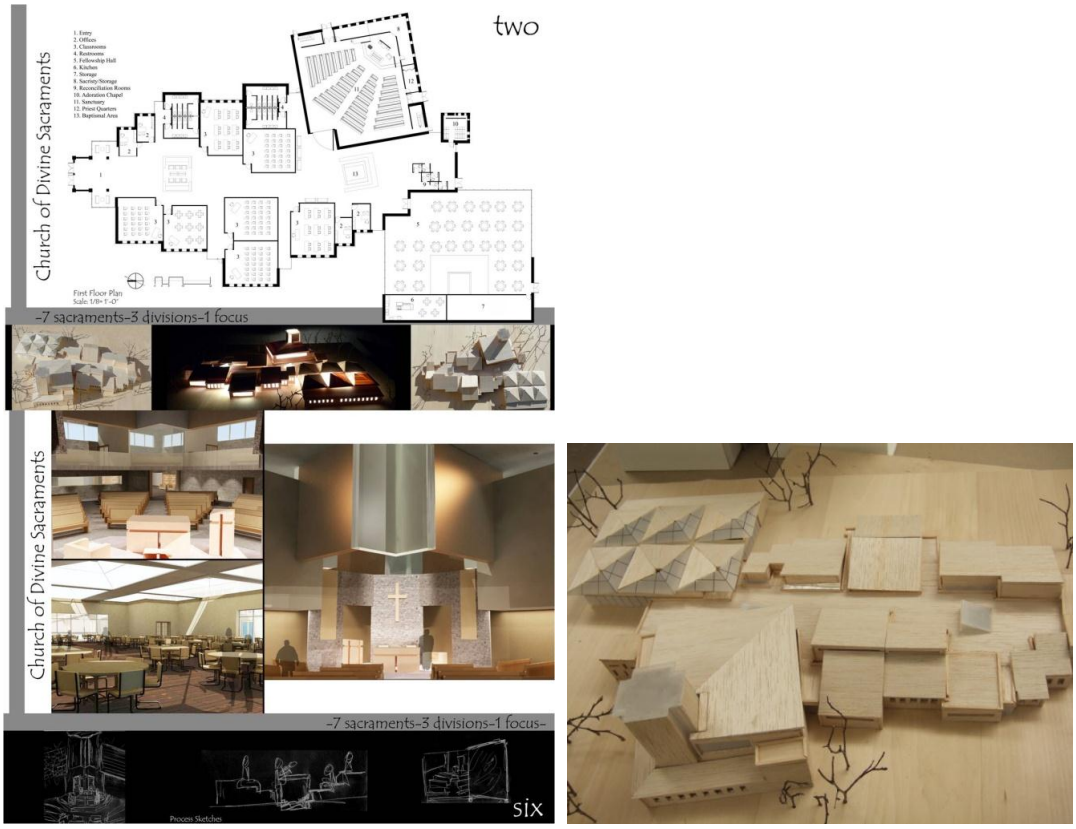

Figure 29. Anne's final design presentation board and model.

In summary, the studio A instructor delivered the fact that people have some impression when they hear the term *journey*, and that impression is closer to *movement* than *static status*. It has more to do with asymmetry than symmetry, and it associates with flow and growth. In that sense, the shape of the chapel is not massive but has an axis with a variety of spaces, so that people can experience the three destinations in the journey. The chapel was designed with the expectation that people enter in one place and experience the journey as they move inside; that means if one enters elsewhere, the individual cannot experience the building as the designer intended. When Anne did not understand the aesthetics in form-meaning relationship, the instructor helped her to

concretize her idea in architectural form by verbally describing her concept in-depth for her to achieve symbolic aesthetics.

Case 2: Bill's Chapel Design—Aesthetics in a Humble Experience and Material Use

Bill was a male student in studio A. His concept of designing a chapel was providing a humble experience that is different from the conventional megachurch. He said that the original meaning of church comes from humbleness and honesty, so he wanted to show that spirit through his vernacular architecture, taking cues from local farm and rural architecture, such as a barn and a silo. He talked about his concept in the design review:

> I want to start the passage that I am working out, from Matthew, "whoever exalts himself will be humbled and whoever humbles himself will be exalted." I want to use humbleness as a part of my design. With that, I am using a lot of things around here, such as barns and silos. (September 18, 2008)
>
> I started from a very simplistic form that was drawn from the architecture in the barn, and I have responded to create a centralized courtyard, gathering space that really responds not only to that site with the parking, and . . . the entrance, street, but also back to each other. (December 16, 2008)

Figure 30. Bill's inspiration—rural and vernacular architecture.

The instructor kept emphasizing not to use the vernacular inspiration too literally and to use it more poetically to fit contemporary architecture.

> What I would like to explore with you, one thing that you have to be very careful of is . . . how not to make literal [interpretation]. (September 18, 2008)

The instructor talked about the meaning of going to church, and he encouraged Bill to push beyond his first design idea:

> Right, but still I think going to church is something ceremonial and very essential. . . . but this entrance, that is very powerful. . . . I think here is the opportunity to try to take it one step further beyond the farm in how to take those forms and create something very intriguing. (September 18, 2008)

Figure 31. Bill's three massing models and plans.

The three massing models, as seen in Figure 31, show that Bill's chapel consists of several building blocks. The instructor emphasized the importance of space between building blocks:

> I think what you need to think about a farm is it as a kind of collection of buildings, the space in between them . . . And not necessarily a strong axis, it needs to be a little bit more soft in terms of how they address each other. I think that the negative space that happens here in between is just as important as positive building themselves, creating a sort of landscape architecture and some kind of urban plan. (September 18, 2008)

As an example of a contemporary interpretation of vernacular features that is not too literal, the instructor suggested a look at Bohlin Cywinski Jackson's Ledge House.

Figure 32. Two views of Bohlin Cywinski Jackson's Ledge House, Maryland.

Note. Left image: *Ledge House*, Edited by O. R. Ojeda, 1999, Quayside Publishing, image 95. Right image: *Ledge House*, Edited by O. R. Ojeda, 1999, Quayside Publishing, image 72

During the discussion of material, the instructor suggested restricting the palette of materials used, recommending reclaimed wood and metal:

> My recommendation is staying in a very small palette of materials. I think the fact that you want to try to do something in this language, probably you want to speak to the same language all around either one of this sort. You can play with vertical, horizontal, and those things, but I would say stay in a small palette rather than spreading [out in] every possible direction . . . you chose already in a sense that probably reclaimed wood and metal. (September 25, 2008)

It seems there is certain aesthetics between meaning and form, so that an architectural design solution makes sense as far as it fulfills the design concept. The instructor praised the match between the concept of humbleness and honesty and the exposure of structure during discussion of the material for Bill's church:

> You have such a strong piece over there. . . . A beautiful thing about that [your building] is the industrial or rural features that you have in there, and exposed structure, which is beautiful as well. (November 6, 2008)

> You are trying to talk about the honesty of the material and the honesty of the building. And [you are] trying to do it with a green approach, and part of it is materials that are exposed. You are not trying to hide their nature; that's why we talked about the wood, . . . so try to express materiality of those things. (November 6, 2008)

During the discussion regarding lighting, the instructor showed Bill a book containing Steven Holl's church and suggested looking at how he carefully introduced lighting into the church:

> He doesn't even open one window to the outside . . . what he does with all those exercises in terms of the screens, in terms of layering from the inside is to bring the light in different filters of color and other elements over there, and to scoop the light into this space and open the window. It's never direct into the space. It's always with a certain layering to soften the light in this space. So think about whether this is what you need to do, by opening the strips over there or by doing something special. (November 6, 2008)

The instructor encouraged Bill to stay in a simple palette of material such as brick and metal. If Bill wanted to make something stand out from other elements, the instructor suggested changing the scale but using the same material:

> The material is the common denominator that will tie the stuff together, so instead of trying to stand out with different pieces, I think you would like to do the same. . . . we may see some change. Back to one of my heroes that I explored, Alvar Aalto, a very famous building in Helsinki, the cultural house. What you have is one piece over there, and you have something totally different one here, connected with it . . . so you have two different colors, two different materials there, but it is very powerful. He did it, you have the right to think those things in a different way, but on the other hand . . . use just scale to certain space and the whole building is totally brick and a metal roof. And it succeeds to highlight important aspects of building, just because of the scale, because of the size, the sheer size and I think that is a challenge. I think in your case, because of the nature you chose, the vernacular aspect, because you need simple pieces that need to stay, perhaps the silo, the bell tower, maybe in a different form . . . . But beyond those things, I would try to tie those things together . . . with the material rather than something [that] stands out. (September 25, 2008)

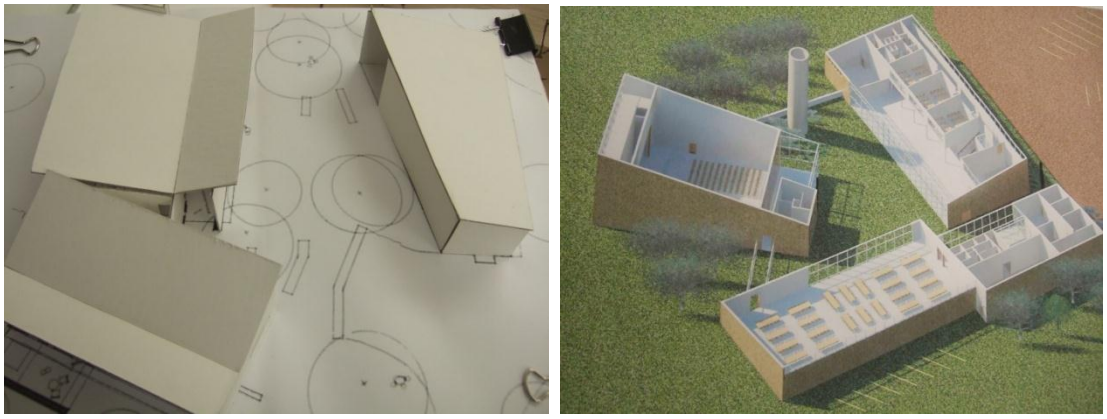

Figure 33. Bill's design development (negative space between building blocks).

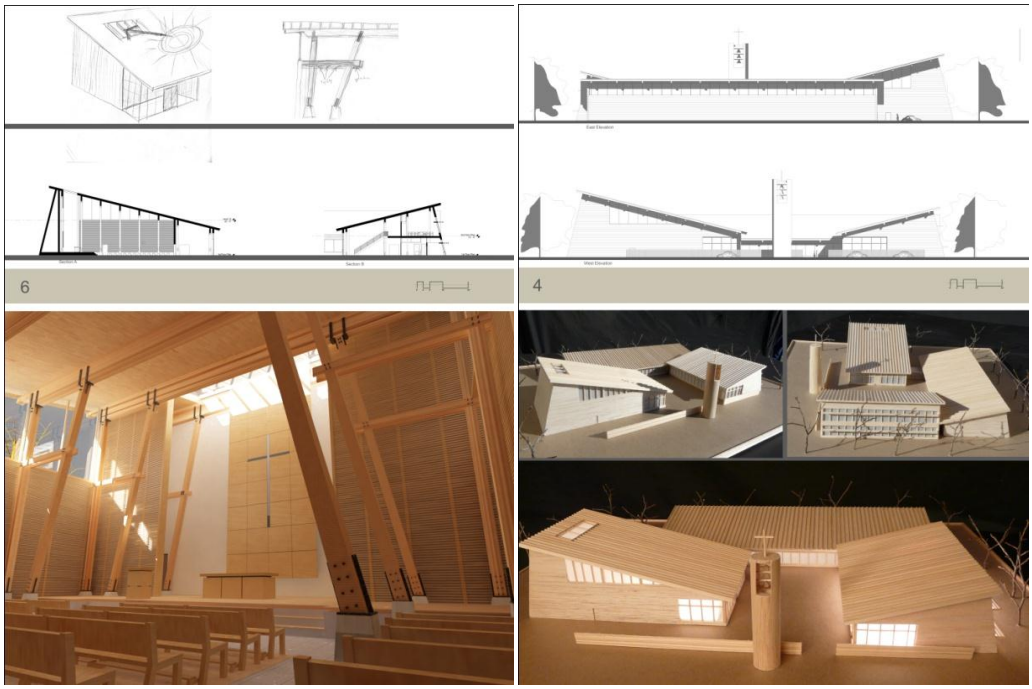

Figure 34. Bill's final presentation board.

To summarize, in Bill's case, choice of material played a significant and positive role in expressing his concept of humbleness because he had a clear idea about form as vernacular architecture. The instructor did not evaluate Bill's concept itself; his concern was how to help Bill develop a form that would embody the concept. Exposed structure, use of a small and simple palette, variations in the size of one material, and use of raw

materials all helped communicate the concept of humbleness and honesty. Thus, in Bill's case, adequate use of materials that embodies his concept well seemed to contribute the most to creating aesthetics.

Case 3: Emily's Montessori School Design—Aesthetics in a Variety of Spatial Qualities

Emily was a graduate student in studio B who had majored in architectural history during her undergraduate program. For her, the studio course was her sixth semester in graduate school. She had a relatively clear opinion about aesthetic education, and her point of view is that aesthetics is not something that an instructor can teach; it is the individual student's purview to recognize it by exposure to many different types of projects and aesthetics. In the first project, designing a Montessori classroom, she explained her concept of weaving strips as a way to explore a variety of spaces:

> [My concept was] sort of inserting or adding things together. I was interested in how I came about having a way of rotating around the space as far as sort of ascending. And I would like to explore that a little further. . . . In this model, you can see the garden along one side. And I decided to put it in the center and have it become a part of this rotation. And I was really interested in just having a variety of spaces, so that even within this larger half, the children could feel like they have their own space. . . . I guess in this studio I was interested in sort of exploration, discovering, as a way of moving about this. And kind of having a view of, where you can get to, or where you are, you can move up into other spaces. Also you use the garden definitely as a tool of a visual connection that you can see. . . have all these spaces from a central pod. (February 02, 2009)

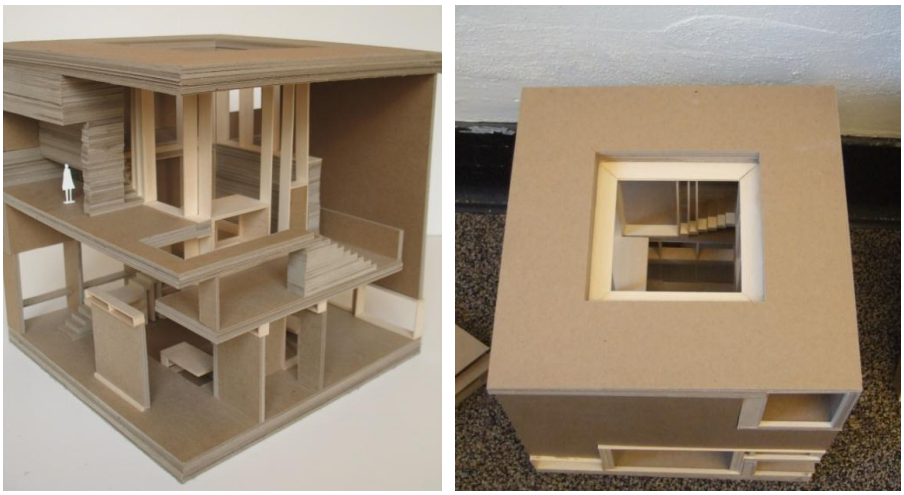

Figure 35. Emily's first project— model of Montessori classroom.

Studio B was different from studio A in that students did not start from their own concepts. Instead, they started reading Montessori philosophy and articles about certain architectural theories such as tectonic architecture. Students were expected to understand the nature of the Montessori classroom first through reading, and then they received the space requirement for the classroom from their instructor. The requirements for the classroom were a small kitchen, library and reading area, storage, bathroom, and garden/courtyard. The instructor also suggested considering Serres' primary spatial types and Froebel Geometries for their design concept. Thus, in studio B the students developed the design concept according to the given readings of theories of architecture and ordering ideas more than their own ideas. One of the emphases of aesthetics in studio B was in the detail and quality of interior space. The main discussion between Emily and the instructor concerned spatial quality, and aesthetics was discussed in relation to the spatial quality and its experience.

As seen in Figure 35, in Emily's classroom unit, she had a central pod (central courtyard) as an open space, and there was a staircase rotating around the center. She

wanted children to explore the space and discover new spaces while moving along the central pod. The central pod works as a visual connection of the whole space in the classroom as well. The instructor emphasized that Emily needed to think of details in space:

> The details of how the materials support are a key in how it looks. I know it takes a while to develop those kinds of things. But you have to be aware of where those kind of key thresholds are experienced and really take some time to think through the details. (February 2, 2009)

In the second project, students were asked to design a Montessori school inspired by an artwork given to them. The required rooms were five classrooms, shared spaces for circulation and hall, staff office, and a garden. Regarding the second project, Emily explained how she interpreted the artwork, saying she was interested in diverse layers of lines and the potential for having unique spaces in where they overlapped.

> I really like the first project because it gives an opportunity to think about a certain spatial quality without all the technical things you have to know about when making a building in site, and so it is a nice way to start because it allows you to think about what kind of space you want to make rather than how your building will work just based on the site alone. I think in the second project . . . the artwork, that was really interesting . . . I also read Collin Rowe, the transparency book, because the artist was one of the authors, it had to do with spatial transparency that wasn't just using visual, like glass or something, and I think the painting had a variety of layers and orders. (Interview, March 18, 2009)

> There are two groups of lines overlapped but at different angles, and I was interested in how and what happen in the space where the two grids overlap, the weird polygon and leftover, so I liked to organize two different spaces [in] each grid, and what their section means. (Interview, March 18, 2009)

Figure 36. Emily's given painting, her chosen painting, and her second project.

Emily changed her given artwork to another one from the same artist. The model in Figure 36 shows that there are five classrooms and they keep the same idea of central pod from model in Figure 35. The instructor considered the relation between space and nature, and the quality of shared space as more important than how it looks from the outside.

> The real critical thing about this project is the relationship of the classrooms, which can be very generic from the outside, but I don't care from outside, but I need to know how they [kids] use that shared space, and what is that shared space . . . you have so many different levels that it's possible that I can leave one space to go out another space. Leave ambiguity to go out to different spaces. There could be landscapes that are very small that sit on the roof, and landscapes that are very large that [are] on the ground, and think about the difference between trees and a pool of water and an organized field of play. (February 9, 2009)

In addition, the instructor suggested looking at architecture as a part of the landscape and in that sense, the given artwork worked as an ordering idea for the whole site including landscape and building. Emily talked about her approach:

> I was interested in how you could take two different grids or more, and different angles and different spaces, intersections and the spaces that arise

> between the two [grids] . . . so I didn't take the paintings that literally and tried to understand how these grids can be layered so that you get different spaces. . . . One of the things we are looking at was the series of spatial types, so these were just a little idea how each of spatial types would be represented in a grid . . . that's how I started this model. I really took this and put it in a bigger scale as a starting point and then, the threshold spaces and the circulation spaces came from the use of second grid. (February 23, 2009)

In the second design jury, there was a criticism from one reviewer that Emily's understanding of the painting is only that of figures. In addition, in the third review, one reviewer pointed out that overall, studio B students needed to think about the site more actively for design development.

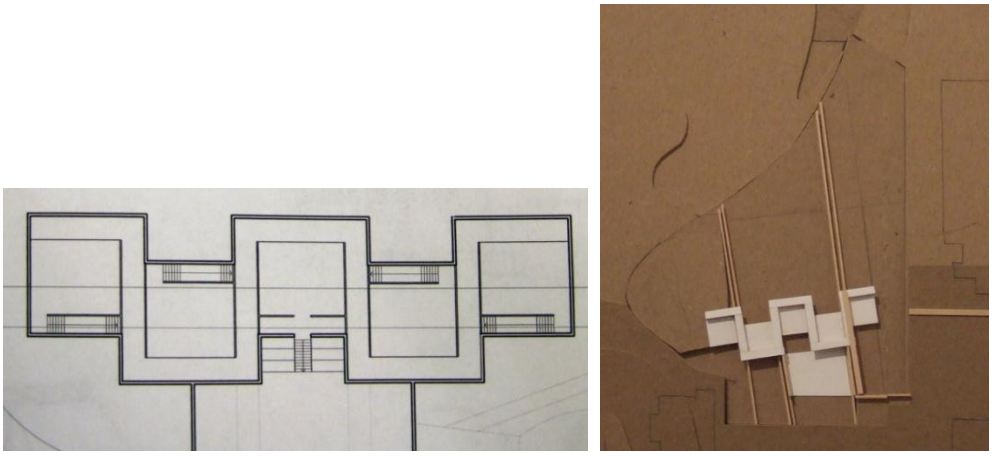

Figure 37. Emily's floor plan and site analysis.

In Figure 37, the right picture shows the shape of the site for the project. The shape of the site is irregular with a curved boundary line on the west side of the site. The students and instructor visited the site; it was very close to the location of the university. While looking at Emily's draft model and site analysis, the instructor pointed out that it was too symmetrical; he suggested blurring the symmetry:

> I think if we read the five classrooms really clearly, . . . to some degree, the classrooms need to be able to push back in special places, not all exactly alike, and then all need to have some sort of access to the shared space. I don't know if the shared space has to be subjected to the

> symmetry. You could make an argument that it could be completely unsymmetrical . . . and have different kinds of spaces because the site is not very symmetrical either. . . . There are other ways to do like extending roofs, which is another kind of way to blur the symmetry in this project. (March 23, 2009)

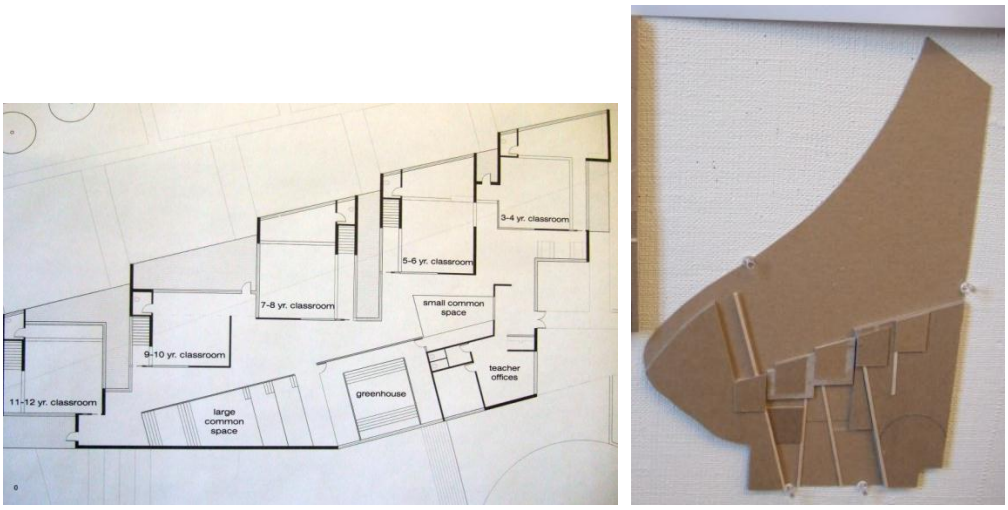

Figure 38. Emily's developed floor plan and site analysis.

The developed floor plan in Figure 38 shows that Emily reduced the feeling of symmetry in her design.

In the final critique, students made a large-scale model of the final design and an expanded section model. Figure 39 shows the final presentation board, the model of the final design, and the section model. Emily explained her approach to the project in the final review:

> So as far as the site relationship to the building, I'm interested in treating harder edges along the more public side, and having this individuality of the classrooms towards the more residential areas. So sort of like a public/ private edge. The play area concentrated along the south and east sides. . . . I was interested in . . . having visual connections with work areas and a variety of workspaces. (May 5, 2009)

Figure 39. Emily's final design presentation board and model/section model.

In the end of semester during the interview, Emily talked about the way her instructor approached aesthetics in this way:

> I don't think he teaches us that making beautiful buildings is important, but it has more to do with not just visual interaction, sort of reactions between the people who use the building. So I think in that way, he is intuitive to proportion and material. Things may not always come immediately to your mind when you think of aesthetics, but when you encounter a building that has a particularly harmonious quality; it has more to do with the body's interaction with the space, and I think that is something he really stresses a lot, and I really appreciate it because . . . a lot of my professors haven't talked [about it]. (Interview March 18, 2009)

In summary, in Emily's case, the main issue of discussion with her instructor was how to define the relationship between individual space (classroom) and shared space (e.g., hall, library) and the relationship between landscape and the building's interior.

Therefore, detail, spatial quality, and how the space is used by people and experienced by human beings were the main topics of discussion. This shows that aesthetics resides in the experience of space and in how people experience the quality of space.

Case 4: Drew's Montessori School Design—Dialogue Between Building and Landscape

Drew was a male student in Studio B who had majored in art for his undergraduate degree. Studio B was his sixth studio in graduate school. He explained his idea of his Montessori school design in the first review:

> I had this idea about . . . sort of having this actual dialogue between the garden and the classrooms. . . . And this idea of this wall [that] separates the two spaces, a small dividing wall. And then in the interior of the classrooms, this layering. I started with some of exercises for the designs, and you know they all have the geology and the sort of layering of the space. (February 2, 2009)

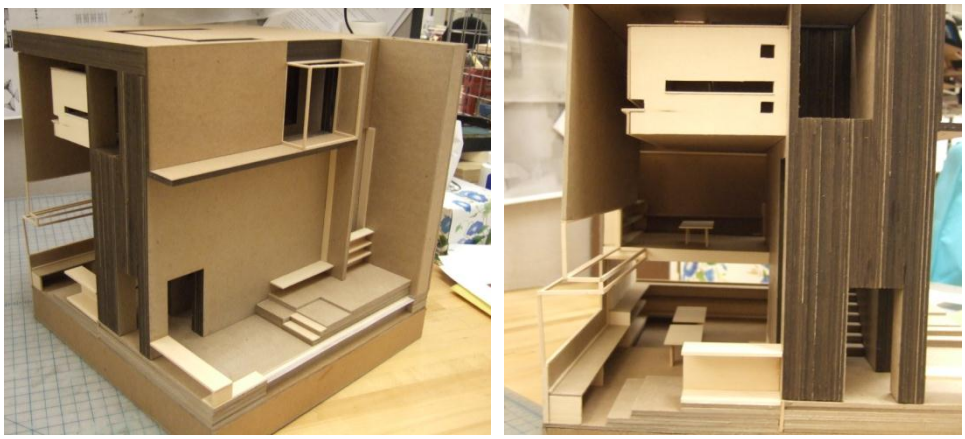

Figure 40. Drew's first project—model of Montessori classroom.

The classroom model in Figure 40 has a thick wall that separates Drew's garden from the rest of the classroom. Drew put all service functions (such as restroom, kitchen, and storage) into the thick wall. In the midcritique, one reviewer questioned Drew about

the primary ordering elements of his design. He answered that his ordering element was the thick wall:

> Well, one of the first things I built in this model was this wall . . . you can go past this and jog this wall. It sort of jogs back this way and creates this U-shaped experience of public space, that I can pose the spaces around it. (February 23, 2009)

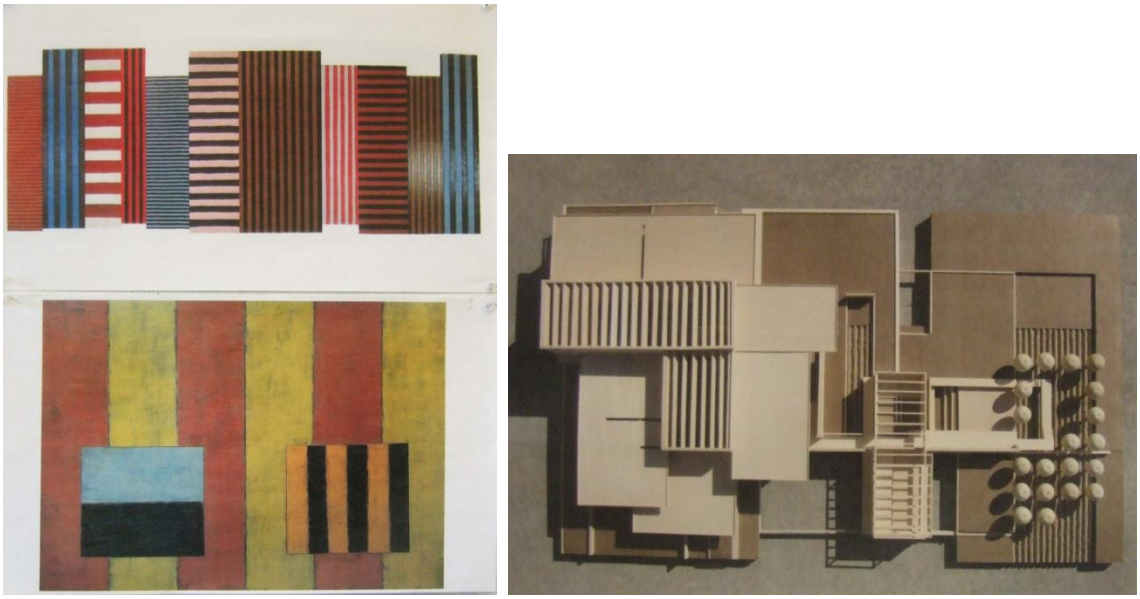

Figure 41. Drew's given painting and the second project.

Drew saw the stripes in the painting as landscape and the different bands as spaces that moved with a slight push and pull. He considered some of the bands as the building and others as landscape. In Figure 41, Drew's second project shows common language with the artwork, namely geometrical shapes and stripes. Drew mentioned that he interpreted the grids in the given artwork as expressing the relationship between built element (building) and unbuilt element (landscaping):

> So I started thinking this top painting and then I did that on the bottom. I started thinking about landscape and terrain and different patterns and things. I started thinking about the erosion, which really fascinated me because my classroom has this massive thick wall that divides the garden from the classroom space. And how it eats away the wall and programs with functional staircases and reading rooms. And then how as the wall

> went through the space, it went from this solid mass to this more delicate band of mass and begin to erode away throughout the space—doing the program as eating up that wall. So I brought that into this project by sort of thinking about the built versus un-built, so essentially all of the wood in this model represents the built, but all the cardboard represents the un-built and sort of shows how the un-built landscape started to erode out away from the building, around the building. (February 23, 2009)

As in Emily's case, the reviewer in the midcritique raised the issue that the students did not present a clear concept and talked too much about the form of the space itself.

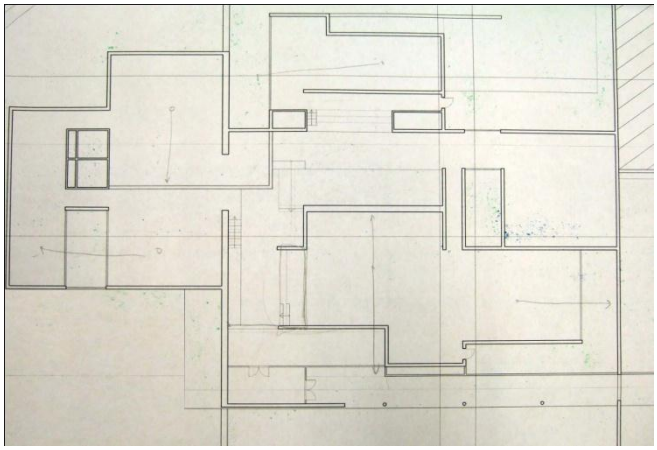

Figure 42. Drew's initial stage floor plan.

In the third project, when Drew applied his idea of a Montessori school in the site, the original floor plan was weighty overall as seen in Figure 42. The instructor suggested breaking the roof down to a small scale, so each classroom would have its own territory in both plan and roof shape. The instructor emphasized the reason to give artwork to students and highlighted the need to consider the push-pull relationship in Drew's design:

> I think all the paintings I gave everyone are very precisely different. A student can identify the figures against a background, and backyard is aggressively stood up, it certainly integrates it into the ground. And we were looking at one painting . . . So there is a pushing and pulling, somehow the building would need to respond to that. (February 9, 2009)

He pointed out that Drew's design is a single mass and suggested finding a way to break it down:

> Think how other people are going to use it [space] . . . it's so big, you want to find a way to break it down, so each classroom can take its spot . . figure out how to get in the studio, so that there's a chunk taken out of each corner or in the corner, or on the edge of each classroom. I don't know whether you thought your thick wall could be the lining of that space. (March 23, 2009)

> But that doesn't mean it has to be read as one big box—it can certainly be read as strung out. It should be more than enough . . . in between spaces. (March 23, 2009)

In the midcritique, one reviewer criticized that in studio B there is too much gravitation toward a certain composition in most of the student designs, including Drew's. Drew recalled his experience with the first and second projects:

> My first project was all about this inhabitable thick wall that links the space together and acts as a transitional element between different elements of classrooms. The thick wall meant to that it held all of the services, staircase, the bathroom, the kitchen—like a service core—but you can also experience the thickness and mass of that wall in different ways in the project, which he (my instructor) liked. . . . The second project was to create a multiple-levels in a single level building by alternating floors, and also enhancing the way of exterior space to blend into interior space, and the connection between the two. I was playing around with the idea of voids in the ground or interpreting water in some way, and it just ended up being this abstract kind of project.. . . My painting, I read it as landscape almost, so I used the idea of bands of landscape to turn into where things happening in the project. I like the painting a lot. (Interview, March 27, 2009)

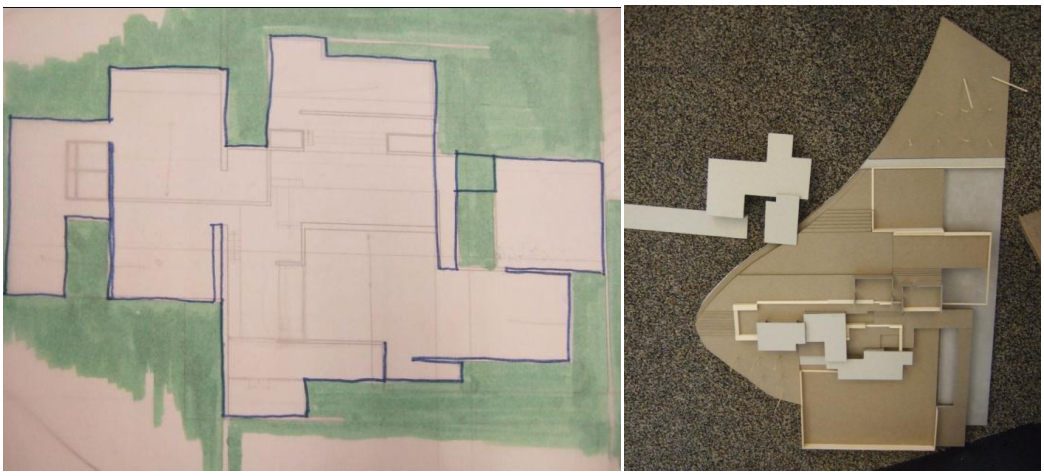

Figure 43. Drew's plan development and site analysis.

The instructor suggested having some open space between classrooms and pushing some elements and pulling others more so that Drew would have a varied configuration. Figure 43 shows a developed floor plan and model applied to the actual site. The floor plan (left side of the picture) shows there is more integration of landscape into interior space and variety in the building outline, so that the landscape is better used and can be more appreciated.

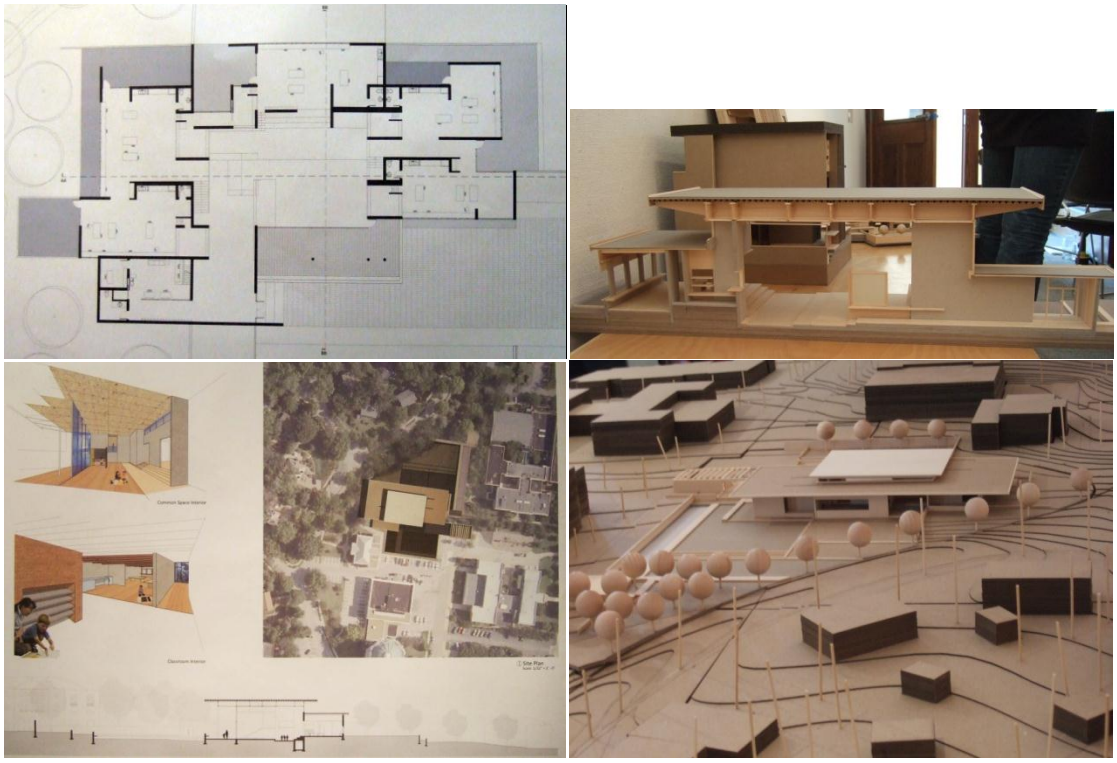

Figure 44. Drew's final design presentation board and model.

In Drew's case, the main issue of discussion was interpretation of landscape, interior space, spatial quality, and exploration of space. In the second and third projects, it was how to define the relationship between building and landscape, as well as between interior space and exterior space. The quality of interior space was a significant aesthetic issue for Drew, as was how to define the roof-wall relationship and express aesthetic

quality through roof design. It seems Drew and the instructor believed that aesthetics is found in details of space.

Case 5: Kevin's Car Exhibition Design—Aesthetics as Respecting the Existing House

Kevin was a male student in studio C who had majored in business management and art for his undergraduate degree. He came to architecture graduate school with the passion to become an architect. Kevin talked about the concept of his car exhibition design approach:

> I wanted to emulate that [existing house to] try to keep it with the house, not necessarily build all the way it would appear. (June 17, 2009)

The instructor acknowledged Kevin's concept and suggested actively using the concept of modules. Using a modular concept was one of the requirements of the project. The instructor considered Kevin's attempt to emulate the existing house as an aesthetic tie to the context.

> So I see that as an aesthetic tie, but I am wondering . . . whether it creates a mass for the main elevation in terms of going over and coming from the existing house. How do you see that working? (June 17, 2009)

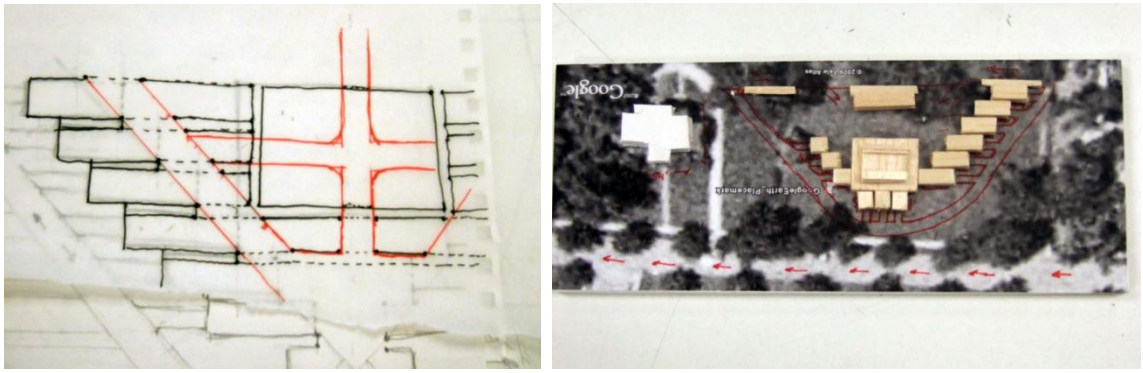

Figure 45. Kevin's site plan and plan study.

Figure 45 shows the concept of using a module. The module was intended to display each car collection because students were supposed to design a house displaying

seven cars. In the pin-up, Kevin explained his design process by saying his intention was to break the symmetry because it separated his site from the existing house rather than integrating it with the existing house:

> The whole points I wanted to keep in mind were modular shapes and forms. . . . I figured there is too much wasted space. After a few discussions, I figured it was a little too symmetrical. By doing that, it [the site] separated it and made it seem like a house, and then a separated site, so I wanted to break this symmetry in some way. (June 22, 2009)

Kevin did not want his design to appear to be a new structure, but he wanted it to fit the existing house and neighborhood.

> I didn't want whatever my design was to be to overwhelm the house by making it too big. I wanted a well-scaled design, primarily because the house and its surroundings, so kind of sketched in the neighborhood, and I didn't want to encroach on that. Then I wanted to create a variety of different paths and sidewalks that connect over to these modules that are actually where the cars are displayed and that separate rectangular building. (June 22, 2009)

As the semester progressed, Kevin had another idea that would use a separate building, and he struggled between the two schemes (central building type versus separate building type). Studio C instructor helped him by asking other students' thoughts about which one was preferable:

> I haven't exactly figured out whether or not I'll keep it a separate building or kind of go back to my initial idea, of having the central building, and kind of tie it back into the middle there. (Kevin, June 23, 2009)

> How many people think something along this would be the best approach? As I said, you [Kevin] could ignore all they [students] say but ask one of them, why they think that's a better scheme. Anyone want to venture here? (Instructor, June 23, 2009)

Students had pin-ups almost every day, and instead of giving direct comments to students, the instructor used other students' opinions to support his own. He did not force students to follow his opinions, but showed what was a common thought among students.

The instructor explained why he thought Kevin's first idea was the better approach and encouraged him to focus on that one:

> I think it leads to a real difference because of the essence of this one [design], there is that kind of centralized gathering space. But this scheme [second design alternative] works in a different way. We were talking about playing this building down and almost burying it. It tends to make it from the street where the collection actually resides. Where in this scheme [the first one], it all works together and makes that courtyard space more prominent . . . you've got something really good on going here and these modules could be really good. My concern is that you just have to say it aloud. (June 23, 2009)

Kevin expressed his understanding of aesthetics as follows:

> Ultimately aesthetics in architecture is very important; at the same time, it goes hand in hand with function and how to fit to the place; it all depends. . . , you know a building may be beautiful in many ways, but if it does not mesh around it [context], I don't think it works necessarily, so that's the kind of approach I had for the first project, I try to make it fit in the place and I think that's beauty. (Interview June 29, 2009)

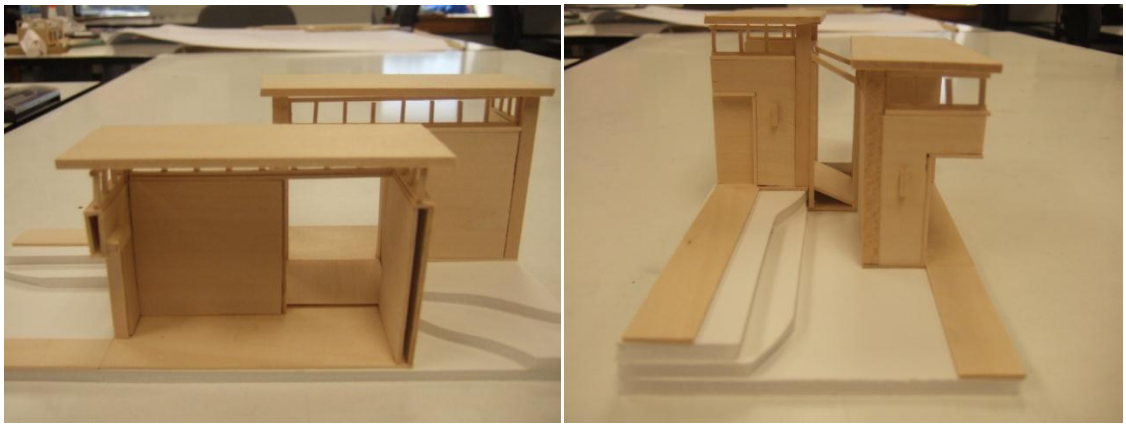

Figure 46. Kevin's section model.

Figure 46 is the detailed section model of one module in Kevin's design. Because the site was sloped, there was a gap between one module and another. In the final critique, Kevin explained his design approach:

> My approach to this project, after studying Kahn, I wanted to take into consideration a variety of principles, the overall approach and modularity.

> . . . Take in consideration his idea of weight as it relates in materiality, and how he used that to give his buildings structure and presence, and how it brings them to life. I also wanted to incorporate the idea of simple forms and shapes, and how that defines space. After that, I initially envisioned having a series of modules brought together by a central building, so I played around with it with several ideas. In the beginning, I started with it being like a B-shape that was symmetrical, and after looking at that and how I thought it would go together, I felt like by doing that, but making it symmetrical and it isolates itself. It would bring that together, all the site together. So I wanted to break that symmetry and working with the modules in a certain way. . . . I came up with this kind of checkmark design, and that fitting in the site and having each individual module each part on their own, and connected by their pressure lock spaces. So this gives each car its own sense of individuality. (July 6, 2009)

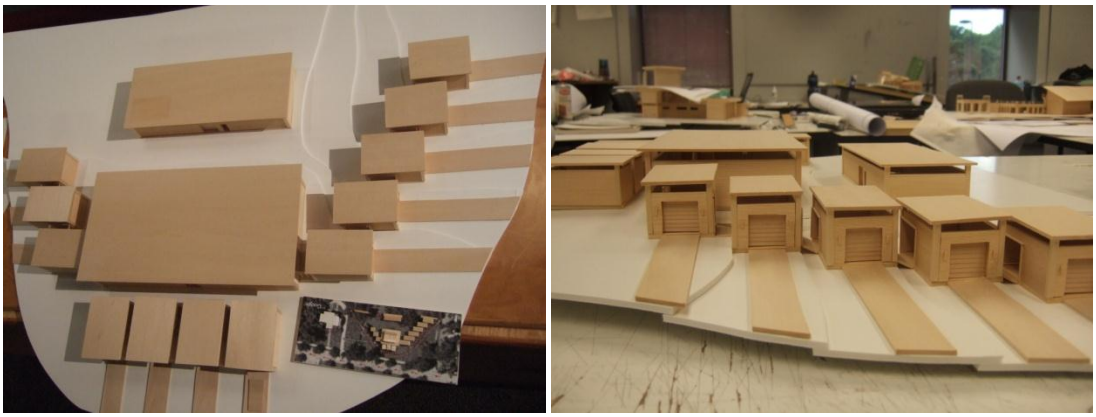

Figure 47. Kevin's final design presentation and model.

Figure 47 shows the final model of Kevin's design. The end of semester presentation included a final model, floor plan, section, and photographs of his final model. Kevin expressed that his understanding of aesthetics changed more toward concerning site during the class in the end of semester interview:

> [The lesson I got was] how a building sits in a place and how people perceive it. I thought, before, just being concerned about how it looks in my mind, whereas now I think more about how it is viewed from outside, you know, obviously what I am doing is successfully fulfilling the requirement; but at the same time, I take consideration for how other people view it, and I think materiality is a big part of it. I really have become interested in how the different materials are put together and contrast. (Interview June 29, 2009)

In summary, Kevin's case is another that includes aesthetics, which is evident in using a simple module and respecting the site. The key issues discussed between the instructor and Kevin was understanding of a module, how a module creates and works as a design principle, understanding of structure, and harmonized connection between the old building and new building. It seemed that contextual fit was identified as the aesthetics in his project.

Case 6: Hannah's Car Exhibition Design—Conquering the Site

Hannah was a female student who had majored in physics and mathematics for her undergraduate degree. Her opinion of Kahn's Kimbell Art Museum differed from that of the instructor. On the second day of the studio, the instructor asked students to look at carefully the Kimbell Art Museum and analyze the space and do sketches. Students were also asked to present their sketches with their thoughts about the building. During the pin-ups, Hannah talked about her understanding of the Kimbell Art Museum:

> This is a picture of the lighting. I started to make little notes about, like how natural light moves and how it creates a silver light effect. . . . Then I moved to this, which is a wall of windows. I thought it was interesting, how he used a lot of natural light, to kind of flood the arch area over here. . . . Okay, then I moved to the outside, and I thought it was really funny to find this entrance next to the parking lot that wasn't decorated at all; there was just the giant sculpture in the front. It wasn't really appealing to me at all. That kind of building, in my opinion, is ugly. (June 11, 2009)

The instructor asked Hannah why she thinks the museum is not beautiful and what would make it more exciting for her. Hannah answered:

> Just more shapes and more textures. I feel like he [Kahn] has the circles and yes, there are arches, but the concrete, in general texture, to me, on the side of building is not exciting. If, maybe, this was brick or a different color, it would be more exciting or more outstanding, and then I would find it more interesting. (June 11, 2009)

The instructor acknowledged that Kahn's architecture tends to appeal more to a certain audience who have knowledge of architecture and who can appreciate material and texture in detail:

> Okay, I'm with you. I think this building needs an acquired taste to begin with. I think most of Kahn's work is, so I really do appreciate where you are coming from. I think laypeople that come to this building, and have feelings like this, until they start to see the arch. . . . by entering through the back door. But for me, that is pretty exciting, being drawn in and going through that blank wall, and finding myself in literally the bowels of the building, and moving up into where the galleries are. But as attending, going through the front door, and walking through the landscape, going up one of those ramps, first and seeing this, more public attribute, probably appeals more to someone, like relatives of mine, that know that much about architecture, so they can start to judge the scale of the building in that way. On this side it requires a focus on the sort of materiality, the joints, the texture, and kind of the myopic view of certain things. So . . . he is speaking in a code to a certain audience. (June 11, 2009)

In the interview, Hannah listed her preferred building as Sydney Opera House:

> I think the Sydney Opera House is beautiful, because of the angle of shape, and it's very unique. It became a landmark; and it is a landmark just because of the unique nature, and where it is placed and all those [aspects] together create beauty. But if it was a square structure like any building, it wouldn't be aesthetic as much. (Interview June 29, 2009)

Figure 48. Sydney Opera House designed by Jorn Utzon.

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Right image: Retrieved from http://www.flickr.com/photos/dan_and_claire_nelson/12799493. Reprinted with permission under a Creative Commons license.

From the beginning, Hannah had an interest in organic shapes, using a circle as a module and a ramp connecting the circles. The instructor suggested looking at architect Frank Lloyd Wright's Guggenheim Museum.

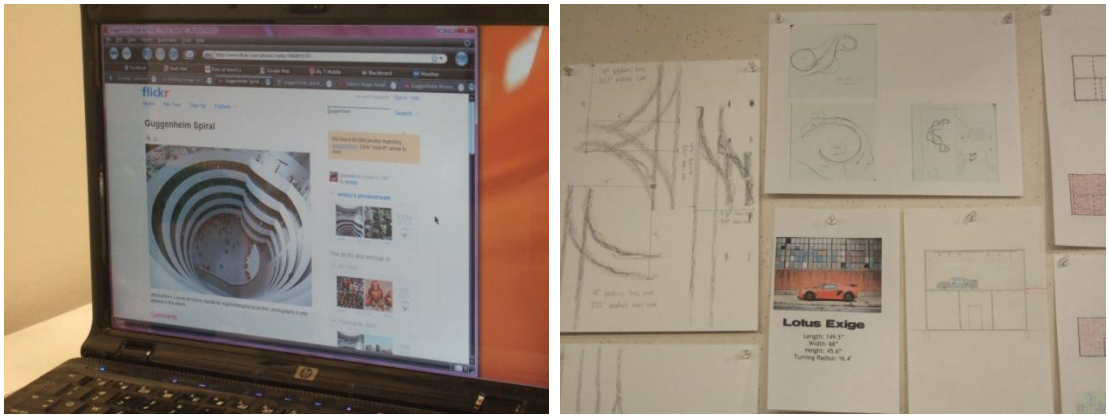

Figure 49. Hannah's inspiration (Guggenheim Museum) and idea sketches.

Figure 50. Hannah's section model and site study.

Her design was unique because most other students used rectangular shape as a module for their design, which seemed to better fit the shape of a car, but Hannah's module was a circle and she connected the circles vertically and horizontally. The instructor praised Hannah's unique design:

> I like the way you're conquering the site, and there's this energy that's getting wrapped into this [space] and dispersed back to this [space], and then bouncing back. The tricky thing about the project, I think, is drawing the elevation (June 22, 2009)

In the final jury, Hannah talked about her concept for and approach to the design:

> My first design was a ramp that spiralled up, and actually built the rest around it, so these two are ramps, . . . So this is mainly for Lotus brand cars [chosen car brand] which are small so, all of those are being manoeuvred. My initial design came from the movement of cars. . . . The Smart car will fit in the spaces, but a little bit bigger. I looked at the shapes it was making and noticed that it doesn't make any squares. I decided not to make my building square in any way, so I used the movement of the cars as they make the shape, the curves around my building. (July 6, 2009)

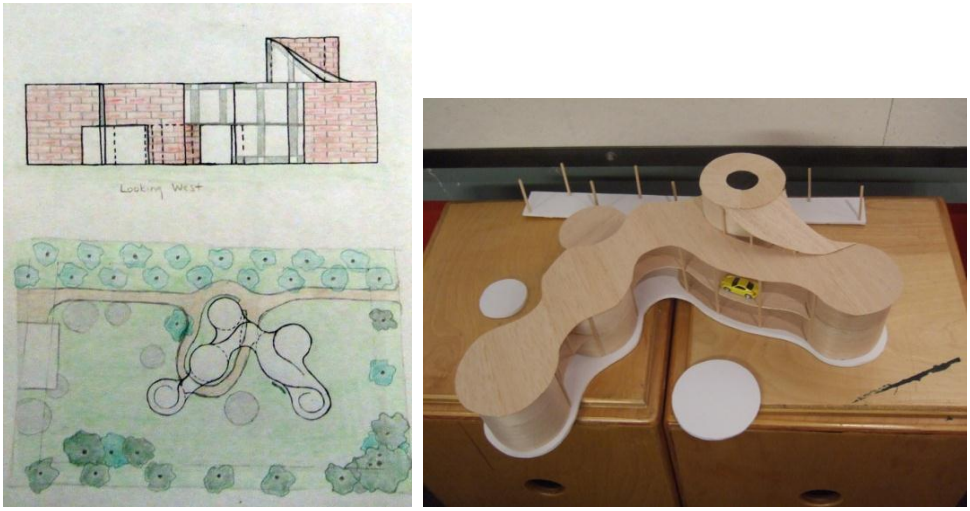

Figure 51. Hannah's final design presentation and model.

In Hannah's case, the main point was her unique approach to the site using circle as module. She did not like plain walls so wanted to use textually rich materials like brick to create a uniquely shaped building. In both Kevin's case and Hannah's case, the instructor and reviewers praised their designs because Kevin's design *respected* the site well, and Hannah's design *conquered* the site well. Thus, it seems that no one idea is the absolutely best concept; it is a matter of making sense by designing building in an appropriate form fit to their concept.

Common Themes of Aesthetic Education Among the Three Studios

The methods for teaching aesthetics varied among the instructors. They provided unique exercises to help students learn to enhance the aesthetics of architecture. For example, studio A instructor introduced a lighting exercise and massing model exercise. Moreover, he used examples of visual materials, such as books with photos of high-quality architecture. He used articulation until he and his students reached a mutual understanding regarding their design development. Studio B instructor provided reading materials and introduced exercises to teach ordering ideas from artwork and thus inspire the aesthetic qualities of students' designs. Studio C instructor let students analyze the precedent building and learn and apply the principles of the precedent building design. He used verbal descriptions to inspire students' own design solutions. However, regardless of differences in teaching methods, several common patterns emerged: (a) they actively used precedents to facilitate students' design evolutions and they had "hero" architects, (b) they emphasized section and model making; (c) they presented essence/principle of design ideas through diverse methods and critiques; and (d) they were good at articulating and clarifying students' design ideas.

Using the Precedent and Having Hero Architects

The three instructors used the precedent in several ways: (a) as a design inspiration, (b) as a limitation or defining the boundaries of student projects, and (c) as a tool to help students develop their own designs. There were three main kinds of precedents used as reference: (a) visual materials, such as architecture books, images and drawings of buildings, and books of artwork, (b) written books and articles on certain theories, and (c) verbal descriptions, such as storytelling, talking about a certain concept,

and word-only descriptions of architecture or an architect. The stages at which the precedent was used were diverse, ranging from design inspiration and design development to design presentation stages.

Studio A instructor actively used books of architecture and architects for the whole design process. He used precedents to facilitate students' design development and for guidance. He recommended books to improve students' design and presentation skills and showed rich examples of architects' work, but he customized the recommended examples for each student rather than suggesting the same examples to all students. To illustrate, when a student developed her design with a combination of irregular room shapes and hallways, the instructor introduced the concept of Datum and let the student find information about it. In the following class, the instructor showed examples of Datum, Alvar Aalto's library in Seinajoki, Finland. In contrast, for a student whose design concept was growing trees, the instructor suggested looking at examples by Toyo Ito.

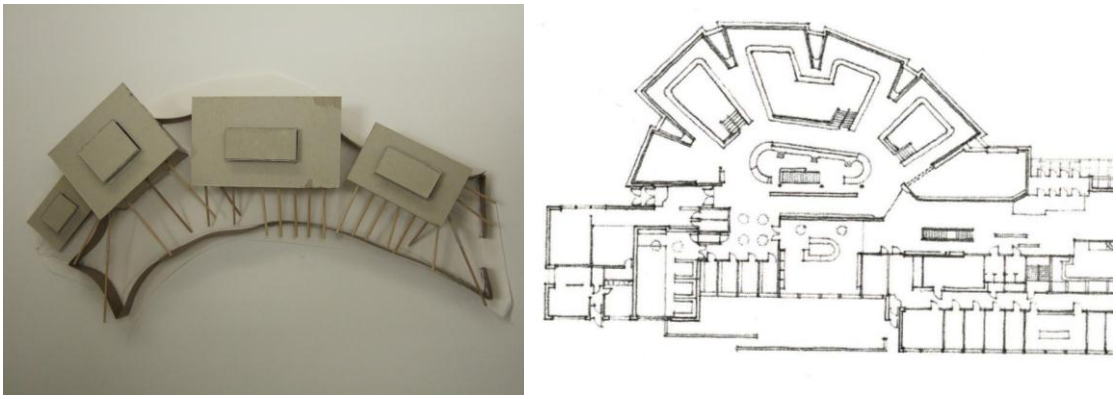

Figure 52. One student's massing model and Alvar Aalto's library in Seinajoki, Finland.

Note. Right image: From *Architecture*, by D. K. Ching, 2007, John Wiley & Sons, p. 403. Reprinted with permission of the author.

Figure 53. One student's massing model and Toyo Ito's Tod's Omotesando in Tokyo.

Note. Right image: Retrieved from http://www.flickr.com/photos/celie/283246194. Reprinted with permission under a Creative Commons license.

He frequently referred to some architects' work from his previous lecture class as examples that the students need to review. Louis Kahn, Steven Holl, Renzo Piano, Alvar Aalto, Tadao Ando, and Peter Zumthor were architects frequently referred in the class. The studio A instructor said those architects were his heroes because they can touch and move his soul through their designed buildings. That is also how he described a good precedent:

> I think everyone has certain heroes in the profession that we tend to refer to more than others. It's very clear that my take on architecture in this era, which I don't know even how to define it, maybe Peter Zumthor, Steven Holl, Tadao Ando probably, Taniguchi. I think that my take on those are they are architects who are creating rather than very elaborating forms, creating atmospheres. They're creating spaces that touch souls; spaces maybe are more about feelings, emotions, than about beautiful forms from outside, so particularly when you watched me, we were doing spiritual space now, so I very much relied on these kinds of architects. You can add Mario Bota. But I think that those are people that can touch my feelings and I react to those kinds of architecture more than others, so that's why, and I am biased obviously when students show me something, I can right away think about a kind of illustration of those pieces. (Interview, April 20, 2009)

For the presentation stage, the studio A instructor asked the students to select an architect from whom they would like to learn presentation skills so that they could emulate that architect for presentation:

> Take more recent ways to present. Check out the library, keep those pieces here, and look at how people present their section, floor plans nowadays. One person in your mind, kind of presentation. In terms of what they have in elevations, floor plans, how they put trees, deal with the site. (September 25, 2008)

Specifically, he introduced Richard Meier as a good example for presentation skills:

> The thing to add is how to present it. . . . I'll show you some of those pieces here, Richard Meir. I would like to show you how to present a site plan. . . . We used to do with small model, we can do it also with a larger one, which is great photograph from directly above, reduce it, and you plug it into the site plan, in such a way this creates shade, so you have some kind of mixed medium of drawings, and on top, you have this beautiful piece. (October 30, 2008)

Studio B instructor's use of precedents was diverse, from artwork to readings of certain architecture and art theories, to images and drawings of buildings that played a role in guiding students' ordering ideas. In studio B, the main architecture precedents introduced were the works of Herman Hertzberger, Aldo Van Eyke, Frank Lloyd Wright, and Louis Kahn. He also used artwork and principles from artwork as precedents. In the beginning of the semester, he planned a collaboration with an art department professor and students. Even though the collaboration did not succeed because the people from the art department did not share their artwork design development with architecture students as often as was expected, the collaboration was intended to provide a place where architecture and art could work together with synergistic effects. The instructor said he believed a great potential can come from the interaction between art and architecture,

which seems strongly related to his undergraduate education in the College of Design, where he learned many different design domains as a result of the Bauhaus influence.

Compared with the conventional design approach that starts from site analysis and programming, this instructor's idea was to focus on spatial quality, such as a small classroom, shared space between classrooms, and quality of landscape, using Froebel Geometries and Serres' spatial types to guide the students in their designs. This approach came from the instructor's interest in the spatial qualities of interior space.

Because the project was a Montessori school, the instructor considered it important for students to understand the Montessori philosophy. To that end, he asked students to read several articles and books about the pedagogy of Montessori before beginning to design. These readings (especially the text by Hertzberger) and the trip to the Netherlands during spring break exposed the students to certain aesthetics with which the instructor was familiar and which he admired. For instance, a set of geometric shapes was emphasized and recommended as a governing order of a Montessori school. The required resources seemed to lead the students' design directions toward the instructor's preferences and recommendations.

Studio C instructor's main source of precedents was Louis Kahn's architecture. He used Louis Kahn's Kimbell Art Museum as a precedent for students to study the architectural vocabularies and languages, and photograph and model making skills. In addition, he used that museum as a starting point for the car exhibition design project because he asked students to use modularity in their design. He explained why he introduced Kahn's architecture in the class:

> He is not very popular amongst the current generations although he was very famous 30 years ago, and he is someone that I think has quietness

> and a seriousness that goes beyond some of the trends of the moment. And I think it helps to discuss with students when they do something that something they just saw in a magazine or something like that, we can say okay, how is this essence of everything we know about architecture, or how is this just a flighty moment of something that two weeks from now, no one will care about. I am also very interested in Kahn because of the way he deals with architectural history and some of the things I'm interested in personally that have to do with sacred architecture and ancient civilization that he starts to touch on, so it makes easier for me to talk from my heart when it is something I really believe in. (Interview. July 1, 2009)

Studio C instructor believed students learn a lot through studying precedent architecture:

> We have to have precedent, that's the best way to learn, and I like to offer [a] mixed bag of precedence, so we looked at the work of one architect, a physical building, and then they look at drawings of another architect—they [drawings] have nothing to do with the first one. So they [students] have to figure out, okay, what's the universal between these two things and where am I? Then they can start to assimilate from everywhere, and their own idea should be what's governing their decision-making process (Interview, July 1, 2009)

He did not use a variety of visual materials of precedents; instead, he used to tell a story to students. He also used pin-ups as a collective place to get to know and look at the essence of the work of all the students, facilitating competition as well as cooperation. He wanted students to interpret his words differently to fit each of their backgrounds and understanding. He was afraid of showing too many images of architecture because he did not want students to confine their thoughts to the shown images.

In the presentation stage, he introduced Richard Meier's drawings as an example of good presentation:

> Everybody knows already a lot of buildings, most of the information is from this guy, Richard Meier. What I've tried to show on the wall are a few projects from different scale; one is a small house, and you will see a site plan with shadows . . . and contour lines, showing the landscape, and very powerful images, sections, and elevations, a good way to think about section, a good way to think about a site plan, then you will see the

ensemble of building, like three spread out on a much more regular site, and use of strangely curving angle wall, holds pieces together . . . and you will see an odd-shaped dormitory building. They are bent, fit to the site, extreme topography, and they play how the bend actually works out . . . and what Richard Meier does is clearly white building, like a glass box around it, and you will see some diagrams that show how to study the existing façade, to abstract museum, cultural center. . . . Because the final plan and sections should be drawn a little bit like what Richard Meier has drawn them, look for Richard Meier styles of buildings . . . look at the presentation of projects, design strategies for multiple buildings on a site. (June 16, 2009)

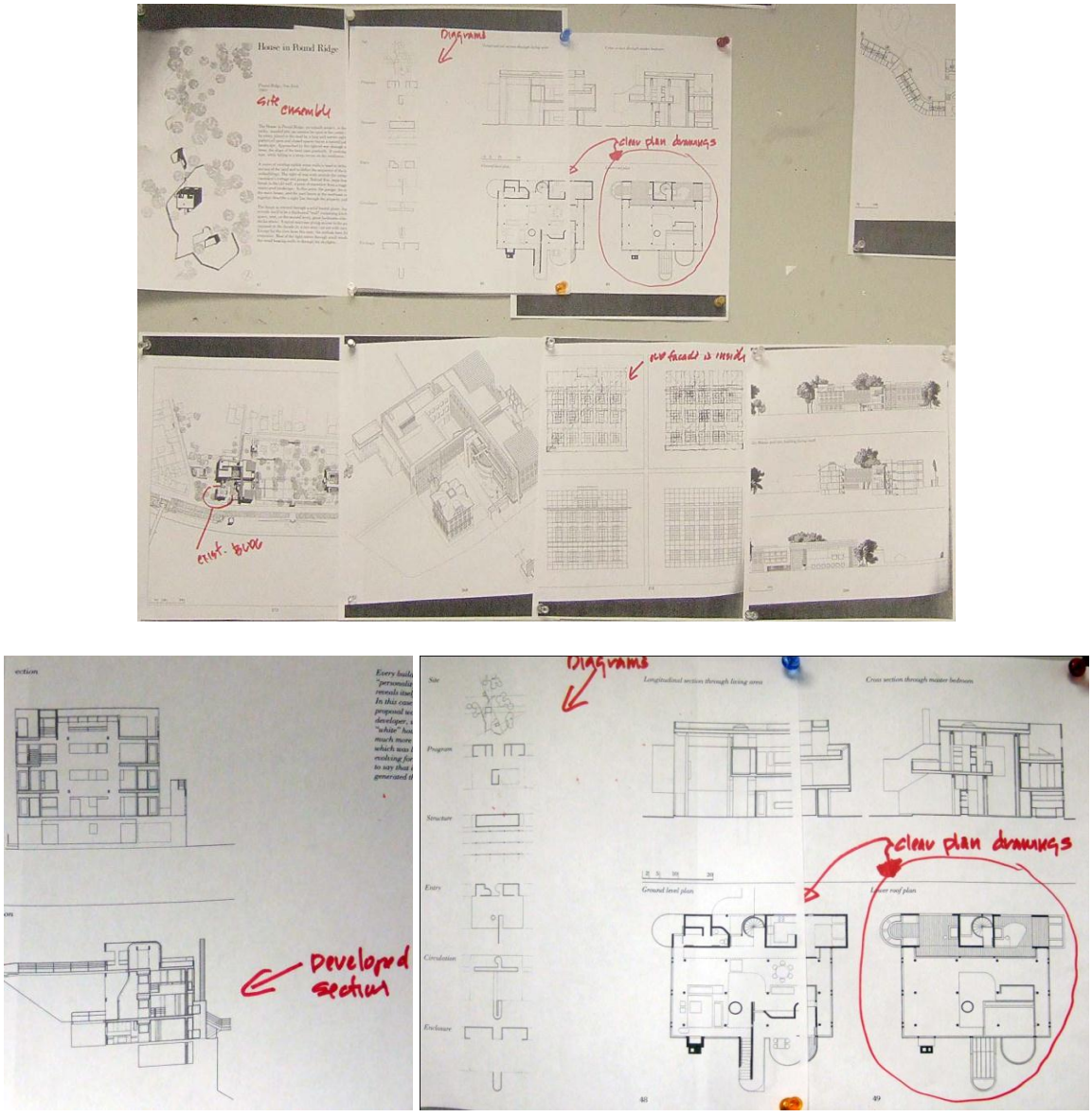

Figure 54. Richard Meier's drawings posted on the wall of studio C.

The precedents used by the three instructors were from their hero architects, as they frequently referred to them in class. Their choices of hero architects are diverse, but they had two in common: Louis Kahn and Richard Meier. This could be a coincidence, but considering the different ages of the instructors (a 20-year age difference among them), and when they attended college (1970s, 1980s, and 1990s), their admiration for these architects seems to indicate that their architecture has wide appeal as examples of good architecture with high aesthetic quality.

The frequent use of these two architects seemed to relate to the three instructors' education. Studio A and B instructors received education from the teacher with the Bauhaus background while studio C instructor received education with a postmodernism influence. The Bauhaus did not value learning history and precedent; instead, it encouraged students to create and invent new products through understanding the nature of materials. Postmodernism started as a criticism of modernism in architecture and its proponents advocated returning to *form* from function and finding connections with the past. They argued that architects would then better communicate with the public and enhance the symbolic meaning of architecture. Because of that, postmodernist architects eclectically used many elements from different eras of history, so stylistically flamboyant that it is difficult to define the essence of postmodern architecture. Postmodernism in architecture was a counter reaction to modernism and has not thus far created its own principles.

These trends seemed to cause the three instructors to long for something substantial, essential (i.e., the principles of architecture) and to think of Kahn's and

Meier's work as comfortable examples to teach because they were thought to suggest the essence of architecture.

Emphasis on Section and Model Making

The three studio instructors all emphasized section and model making. Studio A instructor suggested four benefits of doing section for design: (a) exploring a building better, (b) showing relationship between height and space better, (c) figuring out building for design development, and (d) showing how light enters the building. He emphasized the importance of section for design development:

> It's very important to make sections through those areas. Not only to have the light here, but to see how this guy [building] gets light. (October 16, 2008)

> Do section—as many as you can—because it [section] allows you to explore the building. A section is done in two ways. One, particularly in [the] design phase, it's done to explore what are the relationships between the heights and spaces in the floor plan and how it's done. Without sections, you don't know what's going on. You do sections in order to help you to try to figure out the building. Later on, it also appears as a representation of your ideas. But at this point, use it as a tool to understand better what is going on over there. Because once you have the sections, you'll see how the light comes in and what exactly is going on. And the sections should give us, as much as possible, explanation. . . . So make the sections in the most revealing place, to show this is what you're going to see in such a way that they give us as much as possible information about the building. (October 16, 2008)

> The section is much better at telling you exactly what they look like. . . . The section is much more sophisticated tool to give you an idea of how to put the roofs together. . . . Section is mainly a conceptual idea of space. Section is [a] competitive tool to show your space. (September 25, 2008)

In studio B, there were total four model makings: a cube-shaped classroom model, abstract model of a Montessori school layout based on one artwork, final model of school design, and a detailed section model of an interior/exterior wall. Project 4 was entirely

dedicated to physical modeling and was titled "Section/Tectonic—Between Earth and Sky." Model making was described:

> Sketch project/final presentation component to investigate the section as the vertical datum determined by gravity:
> 1. Make a model of a section "slice" through your collective shared space and a classroom . . . the section should go from earth to sky (foundation to roof) and show both interior and exterior surfaces as well as structural/material conditions inside section cut.
> 2. Conceive of the wall and/or column, the predominant element in these sections, as the product of the dialogue between earth and sky. To determine this relationship, you will need to undertake structural/spatial investigations of floor/foundation and ceiling/roof. (Project 4 description)

He also emphasized drawing section and model making during class:

> I think models, while the craft varies a little bit, show a very strong sense of a particular kind of space, which I don't think is fully captured in a digital model. . . . you might want to think about making at least one section. If you haven't thought about section, you might surprise yourself on what you find [through the section]. (February 23, 2009)

Studio C students made three models through the studio: a model of the Kimbell Art Museum, a section model of one module unit of their building design, and model of their final building design. Making a section model requires certain knowledge of structure and none of the studio C students had taken building structure courses at the time of observation. During desk critique, the instructor suggested a basic structure system fit to the design idea to each student; he believed good architecture comes from understanding of how a building stands.

The three instructors believed section and model making help students to determine spatial needs, contribute to a building design with better aesthetic quality, and reveal hidden spaces. Common opinions among the three instructors were that aesthetics does not develop when we consider the floor plan and programming aspects only;

aesthetics should be emphasized during class projects; and aesthetics is evidenced in both exterior and interior spaces.

Delivering Principle and Essence of Architecture

The three instructors delivered the principles of design elements to students. For example, studio A instructor explained the principle of spatial elements, such as wall and ceiling in a space, as follows:

> In architecture and interior design, there are significant differences in the floor, walls, and ceiling. . . . Walls are opposite to your eyes, which means it's the first thing you see. You can look at [the] floor, but the first thing you see is vertical surfaces, vertical elements, so you can stress certain ideas such as stone, certain materials that you would like to give us, come from your gut. . . then we have textures they are able to display message in terms of character, that is basically a story of the wall. The ceiling: ceiling has more metaphysical meanings. (September 25, 2008)

During a desk critique, when a student stated her idea to incorporate a courtyard in the middle of the church, instructor A explained the prototype of a courtyard. In addition, he discussed the origin and main components of a courtyard, and three elements of a good courtyard. He tried to convey the essence of a courtyard with several good and bad examples.

Another example is an instructor's explanation of the prototype of a museum. There as a students who designed a museum instead of a chapel. Instructor A presented two approaches to museum design: museum as a container (e.g., architect Norman Foster's approach) and museum as an artwork itself (e.g., architect Frank Gehry's approach). By delivering the essence and prototype of space, the instructor helped his students develop an ability to apply what they had learned to their design.

Studio C instructor described the nature of spatial elements that students needed to consider in their design processes and compared the architect's task to that of an author or a filmmaker:

> These exterior windows are not placed for any good views of the outside; they were punched where the architect put them. I have to have a certain amount of light and circulation. I want to think of what that pattern is on the outside of the building. You are the author of the story; you set up the way. Think of it as a film; it has a beginning and if I skip the beginning people get lost. (June 9, 2009)

> I think I have laid that [spatial elements] out today and that it is not the square footage of a room. That is the specialness of the entire thing: the light, the materials, the shape of the room, graphic convention, and graphic sequence. (June 9, 2009)

He also provided an in-depth explanation of the nature of structure and the principle of using different materials.

> Let's talk about structure in architecture. Structure [allows] a building to stand up. The structure can be exposed. We see the columns, which make space, or they can be in the wall, so that we cannot see them. We could have a load-bearing wall, but typically we don't make load-bearing walls that much in public places, but we see them in residential architecture, we use a stick stud wall in that you are more familiar with. If it has a large span, then it might have a column in it. In your mind, if you could have an x-ray shot of a building. . . In this room they didn't cover the joints and crew holes, and there is a pattern happening, they wanted to expose them in some way, different than a sheetrock wall that you would [use to] cover the joints and holes, . . . so the effect was a smooth wall surface that looked finished. So depending on if we use steel, stone, concrete, and even use glass as structure, we have different weights or heavy likenesses, like that structure present in our building. (June 9, 2009)

> Let's talk about wood; it is one of the most ancient types of materials and most architecture books tell it is a humane material. (June 9, 2009)

Verbal and Visual Articulation

Articulation is another common strategy used by instructors to assist students to develop aesthetic design. Students have limited understanding of architecture compared with their instructors; thus, the students' cannot fully articulate their design intentions because they do not have a sufficient grasp of the verbal and visual language of architecture. The three instructors were good at reading each student's stage and/or impasse in the design process, discerning students' intentions even without their full descriptions. They were good at reading students' less-developed ideas and could articulate those ideas in a language appropriate to architecture.

Instructor A used the term *aesthetics* or *beauty* more actively than the other two instructors in this study. He liked using analogy to enhance a student's understanding, as well as rephrasing a student's words in more architectural and professional terms. Through this process, it seems as though the students came to learn how to explain their thoughts appropriately. In addition, the instructors manifested students' ideas in architectural terms by restating students' thoughts using architectural vocabulary and terminology.

Instructor C used to have conversations with a student until they met a convergence in their understanding of a certain issue in the student's design. During a discussion with a female student about her floor plan design, he articulated what it feels like to be in the building she designed. His articulation sounded like an imaginary story, as if he was actually walking around the building. It seemed that articulation of the space led the student to see strength and weakness in her design so that she could improve her design. The instructor said:

> I could think of this project not just as a car collection place, but as a landscape project or a space outside the house. Then, if there are doors, and these columns are coming along the inside of this, then I proceed to have a nice walk at night. Because my cars are all locked down, and I could walk right through here with my martini. And then I could go all the way back. Maybe these doors are open, so I can see my cars. And people really couldn't see them from the street for security issues. But this could be really nicely lit inside at night. But mostly I won't be able to see the cars from inside the house, so I may want to redesign the house a little bit. . . Let's go back to talking about this thing. . . I think we could test it. I don't know what would happen if it curves a little (June 18, 2009).

Perception of Aesthetics and Aesthetic Education

This section presents participants' perception of aesthetics and aesthetic education findings found from interviews with the three instructors, administrators, and their forty students. It consists of followings topics: (a) instructors and administrators' perception of courses that provide aesthetic education; (b) classes student took that involved aesthetics; (c) differences of aesthetics in the current curriculum versus the instructor's education; (d) lack of discussion of aesthetics; and (e) students' understanding of the nature of aesthetics of architecture.

Courses That Provide Aesthetic Education

I asked three instructors and three administrators (department chair or associate dean) about courses related to teaching aesthetics. Their interview responses belong to one or more of the following four categories. They believed that (a) studio is the primary course where a student can learn aesthetics; (b) any course can be a place to learn aesthetics; (c) there is a need to have more emphasis on aesthetic discussion during studio class; and/or (d) the discussion of aesthetics cannot occur in isolation but must always be combined with the function and human experience of architecture.

First of all, regarding courses related to aesthetics, most instructors and administrator said design studio is the primary place of study, followed by history and design principle/visual design courses. However, they believed that any class (history, structure, material) could be the venue for aesthetics, depending on how the instructor may teach/approach the course. It shows the importance of instructors' knowledge of aesthetics when teaching any course. Studio B's instructor noted:

> In my opinion, all classes are involved with aesthetics. I think Vitruvius' things—the definition was never been meant to be divided up. It's holistic; all three things talk to each other, so for me a building can't be beautiful unless the structure also has a certain kind of elegance and kind of efficiency. For me architecture always has to be minimalistic—it has to get the most effect from the least effort or the least cost, so the sustainable building for me is also very beautiful. Obviously the studio is where these all come together, but I think we can also teach structure or another kind of course in a way that has a certain elegance, beauty . . . just to see a beautiful structure always is a source of joy, which must have some aesthetics involved in that—it won't be only technology. (Interview, January 21, 2009)

Studio C instructor also listed studio as a primary course for teaching aesthetics:

> I think it is studio. I think it can happen in other courses, like survey of architecture, architectural history, but it depends on how the material is presented, or what other students have to be in condition to look for those things. (Interview, June 11, 2009)

The associate dean of studio C's department believed that studio is a main course for such instruction but also expressed that any course can teach aesthetics, depending on how the course is taught.

> I think it really depends on how you view that question. I would say certainly studios are because they are making of objects, but I would say beyond that, the question of aesthetics certainly comes out within all our introductory courses and history courses. (Interview, June 24, 2009)

The chair of the department to which studio A belongs listed visual design as a main course for teaching aesthetics.

> We teach aesthetics probably in many different ways but certainly a fundamental class and a visual design class. For example, students begin to visually interpret aesthetics and use jargons, the language of design, principles and elements of design. The discussion of what is beauty is pervasive in those courses. (Interview, September 19, 2008)

Most of the participants said there is a need to have more emphasis on aesthetics discussion. Regarding the question about adding a new course for aesthetics, studio C instructor offered this comment:

> So it might be interesting to think of it as a class of analysis. For instance look at a famous work of architecture from a decoding, you know, let's create images, how this building is balanced, or how it is heavy, or it is light, or how it is beautiful, and what defines its beauty. We have architectural history, but that's basically just "Here is what they did in 1800, 1920, and here's why they are different," but they didn't say, "Okay, here is 1900 and here's why these five are great and 95 are not". (Interview, July 1, 2009)

The studio A department chair expressed the need to add a new course:

> I think that aesthetics is a fundamental concern of our field. . . . What we have missing is philosophical understanding of aesthetics. That's more a graduate-level discussion, and I don't think that we get into cross-cultural discussions of aesthetics, which would be useful. (Interview, September 19, 2008)

The studio C associate dean gave a similar opinion:

> It would be nice to create a section where different perspectives are debated and discussed, so that there is a broader understanding that there are multiple ways of dealing with aesthetics. There is not an answer to this . . . lay that out for students, so they understand it's a matter of dialogue, it's not a matter of given. (Interview, June 24, 2009)

The studio A instructor stated that it is more important to manage the current courses than to add a new course.

> I'm not so sure about separated classes, but I think in every class, particularly in studio, they [instructors] teach aesthetics that things need to come along in one way or another. So I am not sure that we need to add a class, but we need to take good care of classes we teach, particularly studios. (Interview, September 19, 2008)

The associate dean of studio C's school held that the discussion of aesthetics cannot occur in isolation but must always be combined with the human experience:

> My own personal view about teaching aesthetics is that it cannot be separated from the human experience. We can't discuss architecture as this removed art object. We need to understand how people move through it [architecture], what they are doing in there. That would help establish what their responses are aesthetically to that building, so I try to focus on having students think about people experiencing their buildings as they are designing and then [they] are more likely to have a good aesthetic outcome. (Interview, June 24, 2009)

Classes Students Took That Involved Aesthetics

During the student interviews, I asked students to list the names of courses that they took involved aesthetics. They said courses where they can learn about color, material, finishes, and lighting were courses where they can learn aesthetics. Students listed studio as the dominant course for learning aesthetics, as well as courses that present fundamental design principles such as first year studio, visual design, photograph, drawing, history of art, history of architecture, and high school art classes.

One student talked about her history and theory classes, saying they opened a range of aesthetics but the choice was up to each student:

> I had history classes and theory classes, so we did cover all those things [about aesthetics], but I wouldn't say that they pushed us in any direction, you look at a lot of projects, and you decide . . . what is your taste. (Student from studio B)

Another student also mentioned two history courses:

> History of art and history of architecture were very helpful. Knowing what came before you helps you predict and know what you like and what makes you like it. It is a better way of using the past in our own design by not mimicking them but elevating them. (Student from studio C)

A photography course was mentioned as well:

> I think the architectural photography course is helpful partly because the teacher taught me to think about, when I design a building, how a photograph is taken, because when you think about that, then it makes you put more design elements into your building and think about a frame and how to set up the building as a whole [element] from a different point of view. (Student from studio C)

A student listed talked about early design studios and a visual design course as the venue where she learned aesthetics:

> I think the principles were covered in earlier studios and visual design projects we did with lines, planes, and shapes, but in the middle year studios, those [principles] disappeared a little bit. (Student from studio A)

One graduate student recalled his undergraduate school education and its emphasis of aesthetics:

> My undergraduate school was always a strong design school, so I had a strong design background. Well, it [aesthetic education] started out with [certain] pedagogical approaches; it started from an abstractness that provides a series of tools that allow you to figure out a space based on primary elements like planes and to deal with tectonics in how you construct elements. So it started off as an exercise in how you create a space in abstract terms, so they had a rigorous approach to whether you produce abstract concepts and make spatial creations using those tools like planes, lines, and mass. . . I think each professor uses a different approach. (Student from studio B)

Another student said each studio contributed to learning aesthetics:

> Maybe a little part of each studio. I feel aesthetics always comes up when I have a certain gravitation for a certain thing. (Student from studio B)

However, students believed the current discussion about aesthetics is not sufficient, and they wanted more in-depth discussion in classes and studios.

> I feel it [the discussion of aesthetics] is lacking because [even though] there were explanations about terms like *harmony*, it seems just scratching the surface. (Student from studio A)

Students expressed the need to know the reason for feedback regarding aesthetics—not just the instructor's taste or preference:

> Regarding aesthetics, I want to know the reason why it should be like that because that helps me to figure out how it should apply to the next project. (Student from studio A)

> [If we have a separate course,] that will be interesting . . . [a] course about where aesthetics comes from, and why something is more pleasing than others. (Student from studio A)

A student pointed out that, in the review process, often reviewers say their preferences without any explanations; that left her frustrated. She said she wanted to know the reason for such criticism:

> When we are in critique, it is frustrating sometimes to listen to just "I don't like this." That's great, but that is not a critique of my work; that is their matter of taste, in which case, I don't pay attention to comments like that because they are not helpful to me. There are plenty of professors that are good at saying I don't like this, but they can't tell you why. . . It's fine if you tell me you don't like something, but you have to tell me why, so I can understand it and make a change if I agree with that stand point. But for someone to say I don't like this or I think this is wrong. . . in terms of function, it is much easier to talk about it, but with form…. it's not that easy. I think it is not because they can't explain; it's just that they don't want to bother. (Student from studio B)

Differences of Aesthetics in the Current Curriculum Versus the Instructor's Education

The three instructors agreed that there have been huge changes in teaching aesthetics since they studied architecture. They stated that compared with the education they received, the current aesthetics curriculum has greater (a) technological influences, (b) freedom in designing, with fewer limits on imagination and design form, (c) emphasis on learning history and symbolic meanings, and (d) emphasis on exterior styles.

The chair of studio A's department said the influence of technology and exposure to new cultures led to a huge change in architectural education.

> When we didn't have computers, we were using different media to express these problems . . . but it was much more difficult for students to get it and to grasp it. The other things are students didn't travel as much as they do now . . . In the '70s, most students came from small towns, this was the

> biggest [difference] per se, so visual awareness was just ignored. (Interview, September 19, 2008)

Studio C instructor said computer technology was the main force for change in aesthetics.

> The computer has played a role in some of this, in the sense of geometry that we couldn't draw before. We could sketch odd geometries, but we had a trouble in measuring them in order to translate them into a plan so someone else could build, and now a computer can measure better than we could with a straight edge, and we can figure out how to make them and that has been proven. Now the debate is still going on as to whether it is a good thing or bad thing, but as long as the debate is still out there, we are in an interesting moment. (Interview, July 1, 2009)

The associate dean of studio C's school mentioned cultural values as the primary force of change in aesthetics.

> So the first part is certainly there has been a change. I would focus on the American architectural education. . . . I think it is really changing in terms of cultural values, the drive more than anything else. I think some people would think about technology, but it is really about cultural values . . . in the 1970s, we had the rise of postmodernism, and to be quite honest, if you take a look back at postmodernism and deconstruction, I think in some ways they are just wrestling with the meaning and limits of modernism, I think they're responses, too. And I think that is why they have died out over time, because they don't have the fundamental principles on their own. (Interview, June 24, 2009)

Studio A instructor listed increased emphasis on learning history as another force for change in aesthetics.

> In the Bauhaus, they didn't teach history of architecture until the last year of school of architecture. They didn't want students to be influenced by the history of architecture. Nowadays we teach history much earlier—as soon as students get here—so they get images of existing buildings tied in with the context of history. So from this point of view, it's very different . . . because of the influence of postmodernism, nowadays we tend to talk about concept, symbols, metaphors—those things were really brought into architecture, all kinds of forms that were almost forbidden in the past. (Interview, September 19, 2008)

Aesthetics is understood to be inseparable from building performance. This inseparability of aesthetics and function is unique to architecture because other art categories do not have a primary interest in fulfilling function. According to instructor B, how a building looks is not nearly as important as how a building functions and how people feel about the building. He also criticized the trend in contemporary architecture to emphasize the exterior more than the interior quality.

> When aesthetics is overemphasized, which I think it is now, if you look at the American magazines now, almost all exterior photographs are there, no shot of inside, no discussion with people who live in the building—it is just good-looking shapes, and fancy shapes. So I think right now, and probably for a long time, we overemphasize exterior aesthetics . . . . People like Frank Gehry—in my opinion, but I think he is not even an architect. It is my personal opinion, he is rather a sort of very large sculptor . . . We can sit there and talk about another architecture, say this is a very beautiful building but what I mean by that is not that it just looks good, but it means it works in every level. (Interview, January 21, 2009)

> We don't design for architects; we design for people, and most people don't even know how to look at a building, they just find the front door . . . and say "What is inside?" Maybe they don't pay attention to either, but if a building has something interesting, I think, and good architects like Kahn, Renzo Piano, Tadao Ando, you get a beautiful sense from their buildings. People go inside and "Wow, it is very different from most buildings, it makes me stop and think, and makes me appreciate the way the light comes into window in a certain time of day." (Interview, January 21, 2009)

Studio C instructor mentioned composition, the part-whole relationship, and the presentation stage as relating to aesthetics in architecture.

> I don't say "that's beautiful" very often, but I talk more about those things based on things being proportionally correct, not too heavy, not too light, things not being out of place, or adding on. The whole composition becomes delightful based on part-to-whole relationship, so . . . when we talk about when the design starts and critique of designs are under process, my question would be to students, "Why is this piece here?" and then systems start to, and now you're bringing other things, that's not integrated yet . . . aesthetics that comes to studio for me starts from thinking about the presentations of the project. (Interview, June 17, 2009)

Lack of Discussion of Aesthetics

Most participating instructors and administrators spoke about a lack of discussion regarding aesthetics and believed there needs to more discussions about aesthetics in architectural education. They listed several possible reasons for such a lack of discussion: (a) a negative notion of the term *aesthetics*, (b) insufficient time to focus on aesthetics in design studio courses, and (c) difficulty discussing the topic. Studio A instructor talked about the negative notion that proponents of aesthetics consider only form and neglect function and human behavior.

> There are some instructors that don't pay attention to aesthetics. In many cases, they tell students to solve the problems [first] and aesthetics will come as a secondary [result]. They almost . . . criticize those instructors who bring aesthetics into studio by calling them "form givers," saying that they [form givers] are interested only in form rather than human action or activities in buildings. I think that it's not only hurting students, but also hurting teaching, because I don't think we have any other way to experiment [with] those things [aesthetics] other than in studio . . . to be exposed to great aesthetics through studio. (Interview, September 19, 2008)

A school may not have enough room in the curriculum to deal with aesthetics due to the school context and conditions. If a school has a new course emphasizing aesthetics, it may neglect other aspects of instruction. Instructor B said:

> I don't know [if] there is any class specifically that addresses only aesthetics because the difficulty is that for me, we only have students here for a very short period of time, like 2 years or 3 years, and if we divide the discipline up too much, then people begin to think that we think only about the aesthetics, think only about the structure, function, and site. I think, you know, architects need to think about all those things because they all interact with each other, the same way [as] Vitruvius' three ideas, a kind of triangle, but alone they don't have a full impact. (Interview, January 21, 2009)

Instructor C said aesthetics is not a comfortable topic to discuss:

> Well I don't think it [aesthetics] is taught enough. That is, usually it is weaknesses because we focus on planning issues too much, like how many chairs can fit into the room, how many closets you have. Often times, proportion, scale, and just beauty in general as an architecture object, they are taken for granted. I don't think enough attention is paid to regulating it and in really understanding a kind of a philosophy about what aesthetics can be. Once the actual first draft of the project arrives, there is usually only discussion about parts, such as whether [they] work with everything functionally or they are just clunky. (Interview, July 1, 2009)

> As you pointed out, aesthetics isn't a kind of coffee table conversation—at least in my culture it might be, in a larger part of my culture. (Interview, June 17, 2009)

Students' Understandings of the Nature of Aesthetics of Architecture

In the interviews with students, I asked their perceptions of the nature of the aesthetics of architecture, such as what they think about the aesthetics of architecture; how they define it; and from what qualities they feel aesthetic pleasure. There were opinions that aesthetics is the eye-catching nature of the visual aspect of architectural exteriors.

> It [aesthetics] is about the way you feel . . . like how something looks and appears, and emotional response. (Student from studio C)

> It always has to be the architect's consideration because you don't want to build something people will not look at. (Student from studio C)

> I have always seen it [aesthetics] as the way you feel about how something looks and appears. There is definitely an emotional response. (Student from studio B)

Some students commented that if someone does not consider aesthetics, that person is not an architect—he or she is an engineer.

> They are not architects at all, just engineers, if they only look at two parts [function and structure]. So, it's good to focus both on beauty and aesthetics. (Student from studio A)

> Ultimately aesthetics in architecture is very important, and at the same time, it goes hand in hand with function and how to fit to the place. All

> depends on how buildings are beautiful in many ways. (student from studio A)

> I think function is a big part of it [aesthetics] but I think it goes beyond the function. You can design a building that functions properly but until you put aesthetics into it and [make it] visually pleasing, I don't really consider it as architecture. I think there is a difference between architecture and structure, so structure is just simply for function, but architecture delivers visual delight. (Student from studio C)

In addition, students answered that aesthetics and function are equally important when considering exterior and interior quality.

> It's very important because a building that is functioning . . . but ugly does not work well. Also beautiful but not functioning . . . cannot work well. (Student from studio C)

> Architecture should impress people, so [the look of the] outside is very important. Also people should live there, so function is also very important. (Student from studio C)

> I think aesthetics depends on each person; it should be a purpose of feeling. Somebody creates some feeling that people can feel when walking into the building so whatever you come across, you should feel something. (Student from studio C)

> Well, I think that for the space of the building, if the idea is clear, it means that the function is clear, and the interior will be useful for what they need it to be, and from that, you can make a aesthetically pleasing exterior as well from the interior. However, I think you can also have something that is pleasing to look at from outside, but the interior doesn't match with it, and then maybe it is just nice to look at, not a great building… I think that aesthetics is in both exterior and interior. (Student from studio B)

According to students' comments, they considered one of their most significant changes through aesthetic education in studios to be an appreciation of styles and qualities they did not consider beautiful before.

> I have learned that there is more than one way to look at projects in terms of aesthetics. (Student from studio A)

> I have become more aware of combinations of inhabited space and extensive green space. How the building blends into the landscape is

> considered to be one of the primary aesthetic views that I look for in designing building. (Student from studio A)
>
> I feel I understand more about an interior space and how lighting and material play significant roles in aesthetics. (Student from studio B)
>
> I was always focused on interior function as opposed to exterior form without function, and it was wonderful to have a studio verify my feelings. There was also a wonderful freedom of landscape and the flow of landscape through the building interior that I will carry into my future projects. (Student from studio B)
>
> When I first saw Kahn's building, I thought it was very simple, but when I started to look at it, some of the details in a certain aspect in that how it was constructed, and the different vessels of buildings, I realized it is a very aesthetically pleasing building. (Student from studio C)
>
> From outside it looks ugly, but then you see the lighting and all the stuff that Kahn did, which turned out to be beautiful, and I learned how to look at things differently. (Student from studio C)
>
> I learn to appreciate different styles. I personally liked Greek old building, Roman and American colonial architecture, so I was not a really huge fan of modern architecture, but since I have been involved in the learning process and I am learning his [Kahn's] ideas and what goes into them, I now appreciate things that I wouldn't have done before. (Student from studio C)

Not all students seemed to feel the same admiration for Louis Kahn's Kimbell Art Museum that the studio C instructor did. Students' preferred building styles were those with unique exteriors suitable for becoming landmarks.

> I really like the Walt Disney Concert Hall. I lived in L.A. and I like Frank Gehry's house design. I visited his house in Santa Monica and that's more my style. Kahn, to me, I don't like all the work with concrete. It [Kimbell Art Museum] gets very boring from outside. I don't want to design something that you can go inside and see the beauty. I want to make [the] exterior just as pleasing as inside. (Student from studio C)
>
> The Gaudi's Sagrada Família in Spain. . . . It's a visual point throughout the city and such a unique design that it was a standout. (Student from studio C)
>
> Not the Kimbell. I think the Sydney Opera House is beautiful, because of the angle of shape, and it's very unique. It became a landmark . . . just

> because of the unique nature . . . . But if it was a square structure like any building, it wouldn't be aesthetic as much. (Student from studio C)

Students' Perspective on Their Instructors' Teaching Methods

During the student interview process, students were asked their opinions of their instructor's teaching method of aesthetics and studio teaching overall. In addition, I asked students how they experienced the observed teaching methods and how they enjoyed their design process.

Students cited the good features of their studio instructor as "available/easy to talk to," "encouraging," and "having a nice personality." Students cited the instructor's availability when they need advice and the ease with which they could talk to him as the best features of their instructor. Students recalled:

> He is willing to stay after class and help when needed. (Student from studio A)

> His understanding and comprehensive personality. He tries very hard to understand students' point of views when individuals counter whether personal problem or problem with the studio project. And he is very encouraging and it made me want to do better in everything. (Student from studio A)

> I found not all professors are nice. He is easy to talk in desk crit. He never tells you should not do this, which I appreciate. A lot of other professors do not respond to you enough, but he really tries to do as much as he can. He is challenging in different ways, such as through the type of project. I think the Montessori school is a very difficult project to get every little part as right. (Student from studio B)

Students listed the attitude of not being too specific and giving freedom to students as the good features of their instructor. It appears that students prefer flexible design studio environments rather than prescriptive and overly structured environments.

> He refers to other architecture. . . . He is not biased to one architectural style. Actually a lot of professors are very prescriptive, but he is not. (Student from studio B)

> He is very good at looking at [my design], helps you and pulls something out of your work as opposed to pushing his own ideas. (Student from studio B)

> Some professors tell the kind of stuff they like. For example, in the first semester, the teacher just liked using wood, so in order to make him happy, I had to use wood . . . but now I can use whatever materials. It is a good way for me. (Student from studio B)

> I like his criticism in that he is not saying it as a personal attack but just saying it because he wants everyone to learn from it, and I appreciate how he extremely opens to any of your ideas because he ultimately says you are designing it not him. (Student from studio C)

> I like the flexibility he allows us, like using a lot of different medium [in our project]. (Student from studio C)

> He is good at letting you do what you want to do. For me personally, I came up to have a crazy circle design and he said it is okay if you really want to this. That really inspired me even though it might not fit most of the criteria [he expected]. And I like how he lets us figure out how to support buildings even though it was frustrating sometimes specially for the little model, but we learned a lot about how to support buildings. (Student from studio C)

Students also listed giving adequate feedback and examples (including precedent) as good aspects of their instructor's way of teaching. They answered that offering alternative ideas to students' design ideas was more important than suggesting completely new ideas. They commented that completely new ideas confused them, whereas alternatives helped them develop rather than discard their current ideas. Students also cited their instructor's ability to give customized feedback to each student as a good feature.

> He made solid suggestions on developing the architectural aspects of my design work. (Student from studio A)

> I like his way to give criticism. He never said “this is wrong”—he pointed you in the right direction, saying “Look at this.” (Student from studio B)

> It seems like . . . the first couple of weeks we look at precedents, and then say "Ok" and go on and do your own thing. . . . My instructor will say, over the course of the semester; he will tell me like four or more people I should be looking at. It’s more tailored specifically to you and what you are trying to do, but most other professors I’ve had, it is just at the beginning of the semester, you get a person [architect]. You look at it for a couple weeks and put it away. . . I think that it’s always nice to have something to start from, but I think it makes more sense to start from your own idea and then bring in your precedent as you go on, so it’s more tailored to what you are trying to do rather than just chasing after something. (Student from studio B)

However, students listed the instructor's persistent in his ideas and giving similar feedback to all students (rather than customizing his comments to each individual) as least favorite features.

> I wish he let the individual project develop itself with less restricted and preconceived ideas. There was a tendency for all the studio projects to be similarly prescribed in regard to certain elements, such as site strategy, basic organization, and the massive roof presence.

> Sometimes he tries to prescribe design ideas too much, and it is too transparent what he likes.

> I felt that he was very restrictive in what I tried to do with my final project.

Characteristics of the Ideal Design Studio Instructor

Students most often identified giving adequate feedback and guidance as features of the ideal design studio instructor. Personality and willingness to help students, being a good listener, ability to communicate, and rich knowledge and experience were next. A student talked about the significance of meeting a good instructor:

> A good instructor will be able to encourage a student who has a poor design and instruct him or her about how to develop it into a great design. (Student from studio A)

The ability to provide adequate and sufficient feedback and guidance to students was also listed as characteristic of the ideal studio instructor. Students also wanted not just a new idea but something that connects and customized to their original ideas. They said they wanted to be exposed to new ideas, but they also wanted to develop their own ideas.

> A person who can give good alternatives to a student's idea and not a new idea. (Student from studio A)
>
> A professor who can give individual suggestions to each student depending on his or her design. (Student from studio A)
>
> A best professor is someone that communicates their opinion well; at the same time, one that allows you to develop your own project, always express your own project but he is not demanding. He never tells you what to do, but suggests his opinion. (Student from studio B)

The ability to communicate effectively with students and to handle any type of student was listed as two of the most important features of a design studio instructor.

> He is not so dogmatic and not forcing your way of doing things. It is not to say he won't give feedback but he is open to helping you to pursue your own ideas. But at the same time, he is putting his wisdom that he gained over the years. (Student from studio B)
>
> The best professors I've had have always been able to communicate their opinion while, at the same time, allow you to develop your own project . . . and he will always express what he thinks about your work, but it is not in a demanding way. He is not telling you what to do. He is just suggesting his opinion and you do with that what you want, which I think is good and not all professors do that. Well, they all suggest their opinion, but a lot of the professors that I've had said, "I don't like this, you have to do something else" or "Do this, do that". . . . I like when professors provide examples or work they are interested in or they have done, or what they are thinking about in this project, or suggest books to look at, or show images. (Student from studio B)

Having rich knowledge from experience and taking students out of the box were also considered important by student:

> Experience and taking me out of the box. I know in most of classes, [the design product] is a regular plain architecture. I think getting out of that and overstepping a little bit is an important thing. (Student from studio C)

The ability to give constructive criticism so that students can improve their work was one of the important features of being a design studio instructor.

> Someone to criticize. I don't necessarily like criticism, but in the end, it makes sure that your design is better and you think more about how you can do better. (Student from studio C)

Comparison With Instructors in Different Domains

Students who came from different majors other than architecture compared the professors in their previous majors with their current design studio instructors. One mentioned the customization and the significance of understanding students' personalities in design studio.

> Here in architecture, you know who you are, your personality, and attitude about the project. I think that is very important. He [my current studio instructor] is talking with individual students, and he changes the way he approaches based on the students. (Student from studio C)

Another student said there is more interaction in design studios than in other types of classes.

> It is completely different. We are working during the process together. I think my studio instructor is also a part of this project. Here, it is more interactive. (Student from studio C)

Another student also agreed on the importance of interaction in design studio:

> No interaction in the previous major classes. I never explained my work in front of others and we just turned in a paper. Even if it was wrong, there was no explanation. (Student from studio C)

One student compared structured environment versus autonomous environment as the difference between his previous major business class and architecture studio:

> I think it is different in the way of thinking. People in business seem more structured, and architecture is not that much . . . in architecture, the way to work depends on you; it really depends on your level or excitement. (Student from studio C)

In summary, this chapter presented study findings that were organized according to the research questions. Data from observations, individual interviews, and visual material reviews revealed the current status of teaching aesthetics in architectural education and the participants' understandings of the aesthetics of architecture. In addition, the findings show the teaching methods and strategies used by three outstanding instructors.

Their teaching methods were diverse and unique, but there were several common themes, such as customized feedback to each student, active use of precedence, emphasis on section and model making, providing principle and essence of architecture, and verbal and visual articulation. They provided unique exercises to help students understand the aesthetics of architecture. The three instructors' pedagogy of aesthetics was related to their past educations and work experiences; they particularly raised the need to have more discussion of aesthetics and to pay more attention to enhancing the aesthetic quality of student design.

CHAPTER V

DISCUSSION

This chapter is a discussion of the interpretation of the findings from data analysis. This study started with the following four research questions.

(a) How is aesthetics taught in architectural design studio?

(b) What are the three outstanding instructors' teaching methods and strategies regarding aesthetic education in design studio?

(c) How do design studio instructors and students understand the current status of aesthetic education and perceive the aesthetics of architectural design?

(d) What is the process of aesthetic education in design studio and how do students experience such a process?

Data analysis revealed the three instructors' philosophies and methods for teaching aesthetics and identified participants' perceptions of aesthetics and aesthetic education in the current curricula. The three instructors used diverse methods for teaching aesthetics through various assignments, and the method used related to each instructor's teaching philosophy and years of teaching experience. In addition, the teaching of aesthetics was intertwined with other aspects of design because aesthetics is not a clearly separate element. Many components are involved in the process of aesthetic education, such as students' understanding of aesthetics and their levels of architecture knowledge, teachers' education and past experience, and the school's and society's agenda and culture.

This chapter interprets and synthesizes the findings. The chapter is organized according to the following themes: (a) the role of the design studio instructor in aesthetic education; (b) the role of precedent in aesthetic education; (c) possible clash of ideas between the instructor and students regarding aesthetics; (d) two opposing natures of aesthetics in architecture; and (e) the nature of aesthetics as between value and principle. Finally, a theoretical framework to explain the process of aesthetics in architectural education is suggested.

Thus, the purpose of this chapter is to offer interpretative insights into the findings and to provide a more holistic understanding of the topic of the pedagogy of aesthetics.

Role of Instructor in Aesthetic Education

In any type of education, the learner's role in acquiring and organizing information is important (Ormrod, 2004). Nevertheless, in design studio, the instructor's role is much more important than in any other type of class (e.g., lecture or laboratory) because the primary knowledge is delivered through interactions between the instructor and the students regarding student design processes and outcomes (Anthony, 1991; Ochsner, 2000). Studio courses do not depend heavily on textbooks or concrete instructions, and the instructor's creativity in leading the course is important. The quality of student designs demonstrates their knowledge. Thus, the instructor's capacity to guide student design development is highly significant in the quality of a studio course.

The ability to nurture students' aesthetic understanding and to lead them to generate projects of high aesthetic quality depends in many cases on the design studio instructor's personal knowledge and style. Schön (1987) described "designing as a form

of artistry" (p. 18) and emphasized study of competent people as the most effective way to learn artistry. Schön explained *artistry* as follows:

> [It is] an exercise of intelligence, a kind of knowing, though different in crucial respects from our standard model of professional knowledge. It is not mysterious in its own terms; and we can learn a great deal about it . . . by carefully studying the performance of unusually competent performers (p. 13).

Students in the three studios commonly stated that meeting a good instructor greatly influenced their design development and evolution. A student talked about the significance of meeting a good instructor in studio A:

> The designer we become is from the knowledge and experience we take from our instructors. . . . I feel that there are only a few instructors who truly care about the progress of their students.

The students' voices are important because, unless we listen to their perspectives on their studio experiences, we leave out the most important participants in the learning process.

The three instructors had strong pedagogical ideas about education of aesthetics. Such pedagogy came from many sources, such as their educations, work experiences, teaching experiences, meetings with influential figures (teachers in undergraduate classes or supervisors in architecture offices), school environments, societies in which they have lived, and personal interests.

Studio A instructor considered it important for students to have their own concept and ideas when they approach a design project. Thus, he believed his role was to help students to develop their own ideas while sharing his own aesthetic preferences (e.g., the quality of light inside a building) and to suggest ways the form of architecture can embody their concepts. He had his own hero architects. Many of his examples came from those architects, who, according to the instructor, "touch his soul". He believed that if he

did not pay attention to aesthetics, students' abilities to generate aesthetically pleasing design would not be nurtured. As a result of his teaching experience, the instructor realized that unless he emphasized, for example, how a building looks from outside, students would not develop their ability to address the aesthetics of a building exterior. Thus, he changed his teaching emphasis and introduced massing model exercises. As a warm-up, he used light box exploration, but that the exercise changes according to the program of the project. Especially because the semester project was a chapel design, the instructor used a lighting exercise as a warm-up.

Studio B instructor's emphasis on aesthetics related more to the quality of interior space than to a building's external appearance. He believed that a student's intuition about a certain interior space and how the space is experienced are significant aesthetic qualities. He did not value exterior design much. He also believed in the potential for using modern art and architecture together, stating that the two share certain aesthetic properties; thus, studying principles of artwork can help architectural design. He also used architectural theory as an inspiration for architectural design and suggested many readings to students.

Studio C instructor had yet another pedagogy of aesthetics. He rarely used the term *aesthetics* during the class or in discussions; rather, it seemed he did not place much emphasis on aesthetics. As the associate dean of studio C's school said, the instructor's approach focused on understanding the structure (i.e., how buildings remain standing) and the materiality of building. However, the associate dean said that usually this instructor's studio outcomes were aesthetically pleasing. The instructor's pedagogy of aesthetics revolved around timelessness in architecture and/or the essence of architecture.

Timelessness in architecture refers to what is not affected by the changes of history. Kahn liked spiritual places, such as the Pantheon, unfettered by time, location, or programmatic requirements. The spiritual places transcend ordinary life to detect "basic, irreducible principles of architecture serving basic, irreducible verities of human existence—a sense of wonder, the love of beauty, of perfection, the search for the divine" (Twombly, 2003, p. 9). Kahn's belief in timelessness was manifest in one of his speeches: "I believe what was has always been, what is has always been, and what will be has always been" (Kahn, 2003, p. 278)

Essence of architecture means similar to timelessness that refers to what is essential in architecture, such elements as light, material, basic structure and function, as opposed to decorative additions to the form and space. Studio C instructor believed that knowledge comes from understanding the nature of materials and the essential elements of architecture. He wanted students to understand these through pin-ups. Pin-up was a technique the instructor used so that the students could look at each other's work and determine the common themes and solutions and essential interpretations.

Given these diverse pedagogies, then, what is the role of the instructor in aesthetic education? The role of the design studio instructor has changed over time. In the École des Beaux-Arts, the role of the design studio instructor was the same as that of a patron, and there was less interaction between students and instructor than in the present day studio. The master visited the atelier once a week and gave design problems; but it was the elder students who actually worked closely with younger students (Carlhian, 1979). In the Bauhaus, craft and art were considered the same; architecture studio occurred in the last stage of study. Teachers did not teach history of architecture and wanted their

students to function as inventors. Thus, the role of the instructor was to advocate invention.

The U.S. architectural education system is considered to have influences from three countries—France, Germany, and the U.K. (Weatherhead, 1941). From the École des Beaux-Arts in France, the influential art school, the schools in the United States learned about an organized format for formal architecture education. From Germany, the U.S. architecture schools learned about the systematic linkage between teaching and research as well as the strong connection between architecture and engineering. From the U.K., they learned about the apprenticeship or pupilage system (Weatherhead). The following illustrates the different systems. In France, the studio instructor was a practitioner in the seminary system as well as a patron and leader of the atelier. In Germany, the design studio instructor was a member of a disciplined section of the university; but in the Bauhaus, the instructor was an inventor whose purpose was to flush out all the history and create a new architectural vision and product. In the U.K., the design studio instructor was a master, rooted in medieval apprenticeship and vocational training (Weatherhead).

In researching a relationship between students and teachers in art education, Cowdroy and de Graaff (2005) insisted there are four different traditions in art education according to the perspective of creativity: (a) creativity is a "gift" that must not be interfered with or discredited by formal education or teaching; (b) creativity is "innate" and cannot be taught but can be nurtured by a master; (c) creativity can be taught through a studio apprenticeship (such as the Bauhaus); and (d) creativity can be taught only by reproduction of precedent works (as in the Ecole des Beaux-Arts) (p. 510). Among these

traditions, Cowdroy and de Graaff interpreted the third, studio apprenticeship, as an example of "cognitive apprenticeship models in higher education," whereas the "reproduction" of the Beaux-Arts is a model of "vocational education" (p. 4). They argued that formal education of art is mainly a combination of *master-apprentice* and *reproduction* (p. 4). Master-apprentice was the traditional relationship between teacher and students in architectural education as well. Even though the intensity of the master-apprentice relationship may change, the design studio instructor still acts as master in studio and students learn appropriate behaviors, values, and design strategies from the studio instructor (Schön, 1983).

Moore (2001), in "The Scientist, the Social Activist, the Practitioner and the Cleric: Pedagogical Exploration Towards a Pedagogy of Practice," discussed the pedagogy of design studio. Based on two criteria (the type of knowledge transacted and the character of the teacher-student interaction), he suggested four teaching models: *the scientist, the practitioner, the cleric,* and *the social activist.* These are summarized in the following table.

Table 16

Four Pedagogical Metaphors and Their Relationship to Teaching Styles

Type of knowledge transacted in student-teacher interaction		**Character of student-teacher interaction**	
		Formal	***Facilitator***
Expert		**The Scientist**	**The Practitioner**
	Epistemological assumption	Knowledge is external	Knowledge is dynamic, negotiable
	Teaching style	Expert and formal authority	Instructor and students as co-investigators
	Teaching method	Lecture, teacher-centered discussion	Case studies, problem-based learning
Personal		**The Cleric**	**The Social Activist**
	Epistemological assumption	Knowledge cannot be transferred but is transcendental	Knowledge is dynamic, negotiable
	Teaching style	Mystical master	Instructor and students as co-investigators
	Teaching method	Self-discovery activities, coaching, role model	Small-group team work, debate

Note. From "The Scientist, the Social Activist, the Practitioner and the Cleric: Pedagogical Exploration Towards a Pedagogy of Practice" by K. Moore, 2001, *Journal of Architectural and Planning Research 18(1),* p. 62-64. Adapted with permission of the author.

According to the type of knowledge transacted between student and teacher, Moore (2001) suggested two models—*Expert* or *Personal*. He explained the two models as follows:

> The Expert holds knowledge or skills—gained through some sort of experience, whether that be advanced education, research or practice—which is to be gained, in some fashion, by students. The Personal instructor holds knowledge beyond the speakable, to more ephemeral truth about how one should act and think. The Personal instructor serves as a role model which students are to exemplify. (Moore, p. 62)

The Personal instructor's "unspeakable" knowledge is similar to Polanyi's "tacit knowledge," which is the opposite of explicit knowledge (as cited in Schön, 1987). Schön explained the nature of tacit knowledge in such that "the know-how implicit in their actions is incongruent with their description of it" (p. 25) and stated that "learning by

exposure and immersion, *background* learning, often proceeds without conscious awareness" (p. 38).

If we consider aesthetics as a type of knowledge, we see that it is not entirely external or formal. It is a personalized and subjective that strongly relates to one's values. Aesthetic knowledge conveyed by teacher to student is gained from the instructor's experiences. When compared with Moore's (2001) four pedagogical metaphors, the three instructors in this study seem not to belong to only one style. Their type of knowledge is both expert and personal, because they have expertise in certain areas such as material or structure, yet they share their personal values regarding the most important aesthetic aspects of a building. Both normative theory and positive theory exist in the knowledge delivered by the design studio instructor. *Normative theory* is a statement about what is desirable or undesirable. *Positive theory* is value-free and a concept opposite to normative theory. Normative theory is concerned with the views of different designers on the criteria for good environment (Lang, 1987, p. 19). It involves value-laden judgment. Discussion of aesthetics contains the nature of normative theory.

Although Moore classified teaching styles according to four metaphors, my understanding shows from data analysis that a studio instructor does not fit into just one category. Teaching style depends on the nature of knowledge itself, more so in design studio than in a lecture course. Some of the knowledge delivered during design studio is external and objective, such as that concerning function, programming, and structure, but discussions of aesthetics and beauty have personal and value-laden aspects. A studio instructor is *the practitioner* when facilitating each student's design concept, and *the scientist* when he/she delivers objective knowledge but also *the cleric* when discussing

aesthetics and personal values. Thus, if an instructor has a too scientific and too formal attitude in talking about the aesthetics of design, that likely will cause conflicts with students because people are not completely objective when evaluating aesthetics. Students expect to know about the principle behind the instructor's aesthetics, but they think the choice of accepting that aesthetic view should be up to the individual student.

Schön (1987) said that "the coach's legitimacy does not depend on his scholarly attainments of proficiency as a lecturer but on the artistry of his coaching performance" (p. 311) and "coaching would consist in observing students performance, detecting errors of appreciation, pointing out correct response" (p. 39). Moore (2001) argued that in architectural education, supporting courses tend to be dominated by *the scientist*, whereas design studio is dominated by *the cleric*. He suggested, however, that *the practitioner* could be an alternative model for design studio because that pedagogy acknowledges a multivalent perspective rather than asserting right or wrong in knowledge (p. 73).

Regarding the three instructors' teaching methods and characteristics, there are not many previous studies for comparison. Attoe and Mugerauer's (1991) "Excellent Studio Reaching in Architecture" was one of the few. They interviewed 20 award-winning studio teachers and suggested 14 common characteristics (Table 17). They were categorized according to three considerations: (1) teacher as self, (2) personal style, and (3) course format and implementation. Attoe and Mugerauer's findings identified general characteristics of the studio teachers obtained from teachers' interviews only rather than from diverse channels like student interviews or observations, yet the researchers provided an overview of common traits.

Table 17

Fourteen Traits of Excellent Studio Teaching, adapted from Attoe and Mugerauer, 1991, pp. 41-51

Three considerations	**14 characteristics**
The teacher as self (Aspects of the teacher's own life contributing to good teaching)	Vitality
	Genuine and energetic
	Believe teaching is a mission
	A strong bond between teachers
Personal style	Matching teachers' personal interest and style to the course[a]
	Role as coach, counselor, and parent
	Instilling curiosity
	Socratic method
Course format	Use students' interests as course content[a]
	High expectations[a]
	Dropping students in the middle of problems
	Encourage collegiality among students
	Hard work in preparing course
	Having high standards[a]

[a] Indicates a characteristic found in the three studio instructors in the present study.

Of this list, four characteristics seem to be common to the three studio instructors in this study: matching teacher's personal interest and style to the course, use students' interests as course content, high expectations, and having high standards. Three studio instructors used their personal interests and students' interests in developing course content specific to aesthetics. All of the three instructors had high expectations and high standards, and they let students know about those expectations and helped students to achieve them.

Studio A instructor asked students to generate their own concept and develop it, and he was interested in teaching the formal and symbolic aesthetics of building through a massing model exercise. Studio B instructor had interest in Montessori schools, the

quality of interior space, details, and modern art—as shown in his several authored books—and he used those interests in guiding student projects. Studio C instructor had interest in Louis Kahn's architecture, the timelessness and essence of architecture, and masonry work, so he used those interests to develop student projects and exercises. In design studio, the teacher's personal interest and values play a significant role in course structure and learning.

In addition, the three instructors use students' interests as course content. Students said in interviews that the use of their interests as course content, so-called *customization*, differs from traits found in teachers of other domains, such as the hard sciences, where concrete principles exist and learning heavily depends on textbooks and experiments. Knowing students' interests and guiding them based on their interests is a significant element of design studio.

Moreover, the three instructors had high expectations and standards and let their students know about the expectations and standards. They had conversations and discussions until they met a convergence in their understanding and agreement with the students. They suggested alternative ideas and provided precedents to tailor each student's design development.

If teachers do not pay attention to the aesthetic aspects of students' projects, they may deliver only formal knowledge during studio and nothing on values; design studio needs to deliver the latter type of knowledge because it is where students learn the practice of architecture, and aesthetics is surely one of the natures embedded in architecture/interior design. As Schön (1987) wrote, architecture has both a scientific nature and an artistic nature:

> Architecture, moreover, has a bimodality that gives it a special interest. On the one hand, it is a utilitarian profession concerned with the functional design and construction of settings for human activity; on the other, an art that uses the forms of buildings and the experience of passage through their spaces as media of esthetic [sic] expression. In architecture, then, we have access to a prototype of the designer's reflective conversation with his materials; and we can observe it in service both to functional and esthetic [sic] values (p. 43)

Schön (1987) said that learning pedagogy is only possible by learning from competent people who deliver it by exemplification; there is no other way of learning about value and artistry. He wrote "outstanding practitioners are not said to have more professional knowledge than others but more 'wisdom,' 'talent,' 'intuition,' and 'artistry'" (p. 13).

Role of Precedent in Aesthetic Education *(Exploratory vs. Disciplined Approach)*

One of the common teaching methods used by the three instructors was use of precedent, along with hero architects. Precedent played a significant role in three ways: first, as an opportunity to expose students to great examples and great aesthetics; second, as a method to provide a limitation or boundary within which students could develop better designs; and third, as a step-by-step guide for beginning students. Novice students who do not have a background in architecture could gain knowledge through exercises using precedents.

Depending on the use of precedents, there are two approaches in design studios: emphasis on *exploration* versus emphasis on *discipline*. The former gives students freedom in the design process, and the latter sets limits on the design process. Both seem to be important in design education and aesthetic education because the exploratory approach allows students to be creative, and the disciplinary approach can facilitate

students' learning more effectively by guiding the process in steps. The three instructors used precedent as an effective prescriptive method, as well as a way to expose students to examples of good architecture.

Studio A instructor's use of precedent was intended to expose students to good examples and further develop students' ideas. Students have a broad idea of their own designs, but they generally do not have enough knowledge/experience to translate that idea into architectural form. When students were unable to describe their ideas clearly both verbally and visually, the instructor grasped their intentions and articulated their ideas in architectural terms and vocabularies, and he suggested appropriate precedents for them to study and emulate.

Studio B instructor used precedent architecture or architects but also used artwork, readings, and even a field trip. Studio B was different from studio A because, rather than having students start from their own concept, the instructor introduced principles and concepts that students needed to understand before actually beginning to design. These included Montessori philosophy, Froebel Geometries, Serres' five principles of space, and given artworks to aid in developing the project. Thus, students could develop their ideas in-depth within the given limitations. The instructor believed that when there are certain boundaries and limitations, students develop better designs.

Precedents also were used as a step-by-step guide for students. Studio C's instructor used precedent for the design project more actively than the other two instructors did. By studying Louis Kahn's Kimbell Art Museum, the beginning graduate students learned architectural terms, vocabulary, and skills to present through consecutive pin-ups, as well as how to take photos, make models, analyze space, and complete

sketches. Their final project was a car exhibition space design using a module concept derived from the Kimbell Art Museum. This instructor's use of precedent was diverse, ranging from storytelling to verbal descriptions.

Architectural precedents are similar to what Schön (1987) described as a "repertoire of precedents and exemplars" (p. 311) or "familiar situation" (p. 67). Schön wrote, "the familiar situation functions as a precedent, or a metaphor, or—in Thomas Kuhn's (1977) phrase—an exemplar for the unfamiliar one" (p. 67).

The dean of studio C's school said the reason for the prevalence of certain architects' work as precedents arose from the instructor's comfort with and confidence in that architect's work. He made an example of Kahn versus currently popular "star" architects.

> I think to be quite honest, it goes back to fundamental principles. I think that it is very difficult for students to learn about good design by taking a look at what I would consider outliers in terms of design, like Frank Gehry or Zaha Hadid, and yes, they do make the magazines. They are considered our stars, but they violate so many rules from what we assume are associated with good design, and to be quite honest, I think from those in academia, I think there are a lot of questions about those architects, whether the impulse seems to respond on a very immediate, almost emotional kind of way with those buildings . . . that is why an instructor feels confident when the principles of architecture are good, and that is why we go back to those and say "let's go to look at them." I don't think it is a desire to say, "let's go back to modernism and the 60s," it's more that I feel confident that we extract those principles that . . . are more likely to produce good architecture. (Interview, June 24, 2009)

Students appreciated that instructors suggested appropriate precedents for them. They considered giving adequate feedback that provides rich, customized examples as the most important characteristic of the ideal design studio instructor. Specifically, aesthetics is difficult to deliver with only verbal descriptions and without showing examples. In this

sense, knowing students' aesthetics and concepts and suggesting adequate precedents play an important role in aesthetic education.

Clash of Ideas Between Instructor and Student Regarding Aesthetics

Because aesthetics involves personal values about architectural beauty and good design, there were conflicts between students and their instructors. In addition, when the instructors guided a project using a method that was too different from the conventional approach to architecture, there was another conflict with and/or resistance from students. This phenomenon was most obvious in the case of advanced graduate students, and the conflict was amplified when outside reviewers commented negatively about student design projects.

In the middle of the semester, the instructor in studio B gave an artwork to each student as inspiration for building layouts and landscape development. At first students considered the approach to be unique and fresh. However, this approach met with some opposition from the design reviewers, who were new to this approach and from some of his students as well. Some reviewers criticized the approach as not "appropriate/conventional" to the architectural design process. For example, in the midcritique in studio B, several outside reviewers questioned the approach of using artwork as a design inspiration, and after that, students said in interviews that developing a project based on artwork implies a lack of design concept and a loss of their identity as designers. In addition, some students were confused by the approach, especially after hearing the reviewers' negative comments about their projects. One student recalled:

> I was slightly skeptical about the approach. I think that the lesson from the project would be the use of the ideas and the concept underlined by the art,

> but I think the result was that most students copied the form of the painting and directly changed the form of their building rather than understanding the underlying principles of the artwork. . . . I don't want to just copy the painting; I don't want my building to look like the painting. (Student from studio B)

Another conflict of aesthetics between instructor and students was observed during desk critique. When instructors gave feedback about student work, students more willingly accepted the comments on their design project's function (*utilitas*) or structure (*firmitas*) than on the aesthetics. Students tended to be sensitive when their aesthetics met with criticism. This seems to be because aesthetics is in part a subjective value rather than concrete and objective knowledge.

Some students in the three studios complained about their studio's prescriptive environment, where they felt their instructor imposed his aesthetics and gave similar comments to most students. Students felt such an environment resulted in similar design results. Some of their comments are as follows:

> I ended up with a plan and aesthetics that I was not excited about and did not really speak to my initial ideas. I should have been more aggressive about what I wanted out of my project.

> I need to be more aggressive about using my own aesthetics in my projects and not worry about what the instructor wants.

> I think it is important [to have an instructor] who has a similar design sense [as yours] to help fully develop your project and personal design sense.

> I feel like aesthetics always come up that I have gravitation for certain things—I mean the first project was very different for me because I never did just perpendicular; I always do some weird angular shape. Because the instructor always talked about specific interior moments and very fine details of specific corners, I felt the project lacked a coherence of a "big idea" or one primary element that drove and was explored more in the design.

The tendency for conflict between instructor's and the students' aesthetics was more observable in advanced students than among beginning students. In addition, the conflict related to interaction between a student's and an instructor's aesthetic emphasis and preferences. For example, a student who has a strong preference for certain aesthetics would clash with the instructor when their preferences differed, and the instructor emphasized his or her aesthetics too strongly. Then, the student would not feel a strong attachment to his or her project. In contrast, when students held similar aesthetic preferences to those of the instructor, they had a strong attachment to a project.

One student expressed his attachment to his project, mentioning that the similarity between his instructor's aesthetic preferences and his own contributed to the attachment:

> I think you [students] are definitely allowed to pursue your own type of aesthetics; but at the same time, if you're looking at the projects in our studio and then projects in previous studios, they all tend to have a similar feeling. I feel like that has to come from him [my instructor] in some ways. In that, all of our projects are all very orthogonal, very straight lines, that is what I always want to do anyway, but I know some people who don't do that. But it seems like all the projects that come out of his studio have these clear crisp walls, which I love.

The following diagram shows the relationship between the degree to which an instructor emphasizes his or her aesthetics and students' attachments to their projects.

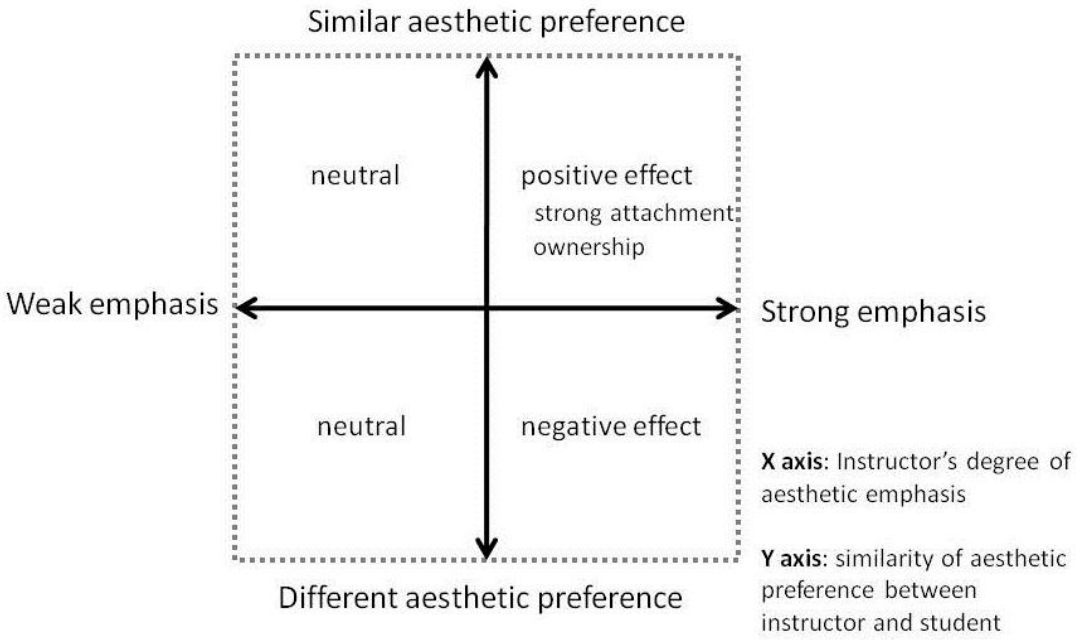

Figure 55. A student's attachment to his/her project results from interaction between a student's and an instructor's aesthetic emphasis and preferences.

In Figure 55, the x-axis indicates the instructor's degree of aesthetic emphasis, and the y-axis indicates the degree to which the aesthetic preferences of instructor and student are similar or different. When an instructor strongly emphasized his own aesthetic and asked students to follow it, they felt the project did not belong to them and that felt they were working for the instructor. Even though the design result was good and was appraised as successful, if the students did not feel ownership of the work, it seems they did not gain satisfaction from their project. One student expressed a similar opinion:

> I think architecture is so subjective, but there should be some kind of balance between what the professor instructs you and shouldn't instruct you.

Students did not openly discuss this conflict, but individual interviews and studio observations revealed this phenomenon. In addition, the tendency to clash was observable in reviewers' comments when they misunderstood the instructor's intentions (i.e., why he

introduced a specific assignment with a specific sequence or method). It shows that reviewers' comments were based on their understandings, and students sometimes felt confusion from the different reactions to their projects.

Two Opposing Natures of Aesthetics of Architecture

Form versus Emotion and Visual Object Versus Spatial Experience

In all three studios, instructors and students did not use the term *aesthetics* frequently. Rather, they used other terms to express the nature of aesthetics, such as *appearance/looks*, *beauty*, *form/shape*, *goodness*, *organizing principle*, *proportion*, *vocabulary/language*, *emotion/impression*, *pleasing*, and *preference*. These terms can be divided broadly into two categories: *formal attributes* (e.g., appearance/looks, form/shape, proportion), and *emotional attributes* (e.g., pleasing, preference). On one hand, as Clive Bell (1914/2007) said regarding that "significant form", aesthetics resides in formal (objective) attributes. On the other hand, as Kant (1790/1951) and Hume (1757/2007) suggested, it relates to the viewer's (audience or user) emotional (subjective) attributes. Kant stated that aesthetic judgment involves feelings that are subjective in nature (as cited in Stamps, 2000, p. 35).

In addition, participants had two different views on the aesthetics of architecture: as *visual object* or as *spatial experience*. These two views were discovered from the analysis of the realm where aesthetic discussions took place. Aesthetic discussion occurred in such realms as *color, facade, finishes, lighting, materials, exteriors, interior space, in-out relationship, materials, sequence, spatial quality* (see appendix E). Whereas most instructors emphasized spatial experience, lower-level beginning students had a

tendency to consider unique exteriors and landmark buildings as the expression of architectural aesthetics. It seems the process of aesthetic education lies in acquiring the eye and perspective to see beauty in new ways. Students learn that beauty exists not only in building exteriors but also in the interiors and the spatial experience of the users. Figure 56 shows the two representative categories from alternative expressions of aesthetics and realms where discussions of aesthetics occur regarding architectural design.

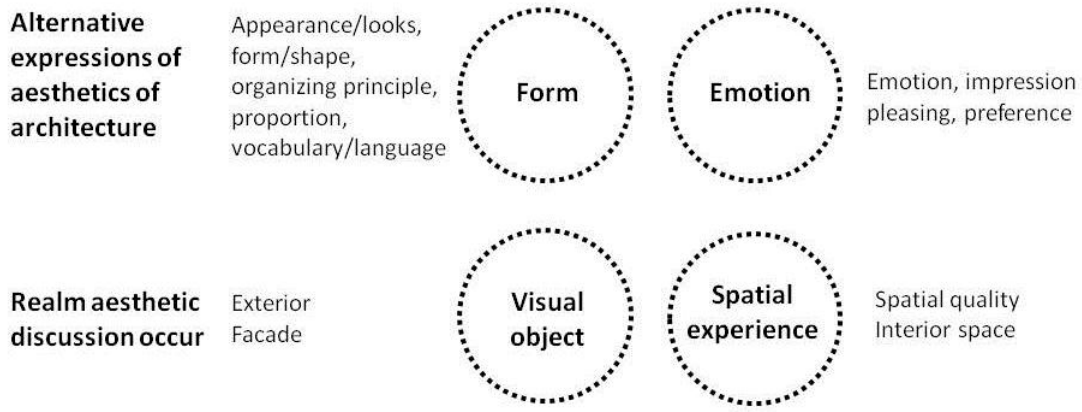

Figure 56. Alternative expressions and realms of aesthetics of architecture.

Typicality Versus Novelty and Classical Aesthetics Versus Expressive Aesthetics

During observations and interviews, students and instructors used the following phrases when they wanted to express the property of aesthetics of architecture: *breaking symmetry, consistency/coherence, contrast, fit to context, focal point, holistic, meaningful, not literal, poetic*, *special, standout,* and *uniqueness*. These expressions can be divided into two main categories: (a) something that fits well and harmonizes with its context (e.g., consistency/coherence, fit, holistic), and (b) something that is unique and stands out (e.g., breaking symmetry, focal point, standout, unique). These two categories

correspond to the preference-for-prototype model and the preference-for-novelty model, respectively.

There are two models that explain the relationship between preference and typicality/familiarity or novelty/unusualness (Bishop, 2007). The preference-for-prototypes model (Whitfield & Slatter, 1979) posits that people prefer "the typical examples of a category, the ones that are often also very familiar and we have been exposed to repeatedly" (Hekkert, 2006, p. 167). At the same time, there is the preference-for-novelty model (Martindale, 1990): People tend to prefer something new and unique to them. Both models are supported in some degree, but neither is conclusive; they each show a tendency of human behavior.

The previous two theories correspond somewhat to Lavie and Tractinsky's (2004) two aesthetic dimensions of visual perceptions: *classical aesthetics* and *expressive aesthetics*. Classical aesthetics includes aspects that have been common from antiquity to the 18th century, such as order, clear design, and usability, and expressive aesthetics includes a designer's creativity, originality, and ability to break down conventions (p. 269). Lavie and Tractinsky found that classical aesthetics is represented by the following design attributes: aesthetic, pleasant, clean, clear, and symmetrical, and that expressive aesthetics is represented by these attributes: creative, original, sophisticated, and fascinating.

Lavie and Tractinsky (2004) argued that their descriptions of classical and expressive aesthetics correspond to findings in architecture—clarity/orderliness versus richness/diversity/ornateness, respectively (Nasar, 1988; Oostendorp & Berlyne, 1978). Lavie and Tractinsky insisted that the classical aesthetic increases understanding but

reduces ambiguity, whereas the expressive aesthetic increases arousal or involvement (p. 288). Based on this definition, preference-for-prototype is similar to classical aesthetics, and the preference-for-novelty model seems to agree with expressive aesthetics.

Figure 57 shows these two opposing natures of architectural aesthetics and compares them with other dualities explained in this chapter.

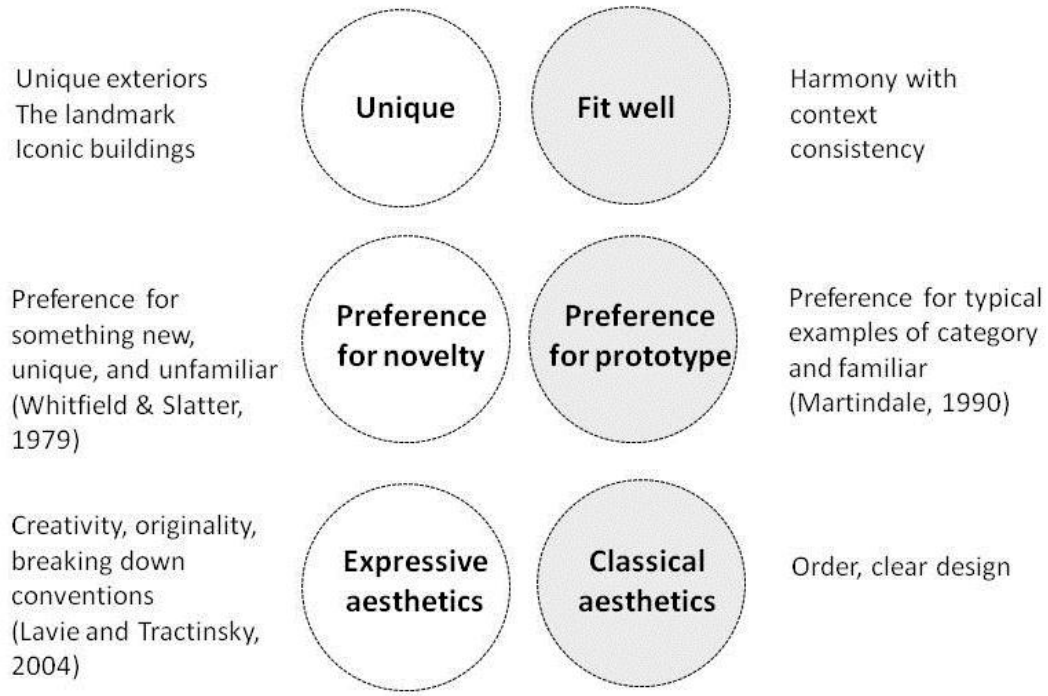

Figure 57. Two natures of aesthetics of architecture.

Aesthetics of Architecture: Between Principle and Value

Principle Versus Value

Unlike utility and structure, aesthetics relates to values. When instructors did not understand this and approached aesthetics as if it were a type of expert knowledge that can be objectively learned and delivered, there was some resistance from and/or conflict with students.

Nevertheless, even though aesthetics is considered a value that differs from person to person, students wanted to know the reason for another's aesthetics; thus, it can be called "a value with reason." Students wanted to hear the reason/principle behind their instructor's criticism regarding the aesthetics of student projects. In addition, students wanted to learn their instructor's aesthetics. Students said they can learn and absorb when their instructor's aesthetic responses are concrete and specific. However, when instructors and critics just say they like or dislike students' designs, students said they do not consider these comments seriously because they identify them as merely individual tastes/preferences. The following figure shows the relationship between the values and principles underlying studio content.

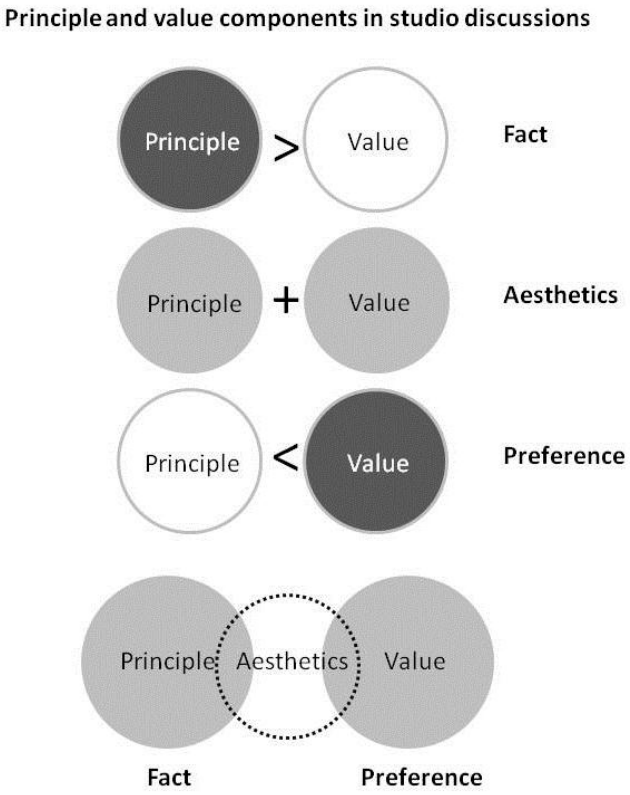

Figure 58. Relationship between principle and value components.

Note. The background color indicates the degree to which the property exists (i.e., the darker the color, the greater the weight of that property).

To illustrate, as in Figure 58, a fact is a state where only principle exists. *Fact* is "a piece of information presented as having objective reality (*Merriam-Webster Online Dictionary,* 2003) and p*rinciple* is "a fundamental truth or proposition that serves as the foundation for a system of belief or behavior" (*Oxford Dictionary of English*, 2003). In contrast, if only personal value exists, it is a preference. *Preference* is "a greater liking for one alternative over another or others" and *value* is "the regard that something is held to deserve; the importance, worth, or usefulness of something" (*Oxford Dictionary of English*, 2003). Aesthetics, specifically in education, both of value and principle positively exists. Aesthetics has value and a normative nature, but it also requires a certain discussion of principle/reason. If principle is not presented, students consider an instructor's comment as just individual preference and thus irrelevant to them. If personal value is ignored and only principle is emphasized, students feel a loss of their identity as a designer.

Aesthetics and Ethics in Architecture

The three instructors perceived a stronger relationship between aesthetics and ethics. Discussion of ethics has two areas of emphasis - morality and goodness (Davis, 2006). Morality concerns with people's modes of conduct regarding virtue such as justice and duty. Goodness, from a utilitarian point of view, concerns the greatest benefit to the greatest number of people. In architecture, in many cases, ethics is discussed along with the interest in goodness, a matter of architecture that functions well (Lagueux, 2004).

In the discussion between an instructor and a student, if a student's work did not make sense in terms of function/goodness, there was a tendency for the instructor to halt the conversation. It seems that once it has been assessed that function/goodness was not

fulfilled, aesthetics/venustas could not be discussed, and instructors do not want to engage in dialogue. There was a similar tendency in the design review process: Reviewers did not continue discussions when students' work did not fulfill reviewers' concepts of goodness. As Collier (2006) said, architecture is by definition ethical because its function is "to create appropriate places and contexts of social life" (p. 307). This is one of the greatest differences between architectural aesthetics and that of other arts.

Fitch (1988) argued that architecture does not involve "spectators"; instead, it demands "participants" who can be submerged in the experience, and not just look or observe (p. 4). Aesthetic experience with architecture is "one of submergence rather than passive and contemplative exposure, as in the case of art" (p. 6). Aesthetics cannot be considered separate from other aspects of architecture. When instructors talked about aesthetics of interior space, it was not only a discussion of color and shape of the space, but also of the people who use the space. Students, however, tended to think of the exterior as the venue for aesthetics and considered iconic buildings to be more aesthetically pleasing, such as those designed by star architects (Frank Gehry, Zaha Hadid, etc), rather than the spatial quality of the interior.

A Theoretical Framework of Process of Aesthetic Education and Contributing Elements

Based on observations of studios, interviews, and visual materials review, there are many components that contribute to the process whereby students acquire knowledge of aesthetics in architectural design. They are (a) the epochal environment, (b) societal environment, (c) design community environment, (d) school environment, (e) instructors'

past educations and experiences, (f) instructors' aesthetic preference and aesthetic value, (g) students' knowledge of design and understanding of aesthetics, and (h) reviewers' comments.

The *epochal environment* refers to the broad period of time in which the studio was taught—a matter of "when." The *societal environment* encompasses a vast agenda, such as the development of technology and the cultural environment in which the studio education is positioned. It is similar to what Lang (1987) termed *broad society* and relates to the location within a certain time. The *design community* refers to the environment consisting of professional architects and designers that frames the culture and aesthetics of the practice. Organization of professionals, organization that endows awards to architects as outstanding designs, and architectural magazines that introduce good works of architecture can belong to this category.

The *school environment* means the characteristics of the school, such as philosophy, mission, and orientation the specific school pursues; it relates to whether the school is a public university, private university, vocational school, liberal college, or design school, and/or on what basis the architecture school has been established. If the school was established by a specific figure such as a famous architect, his or her aesthetic point of view may heavily influence the direction of studio teaching. For example, in the Illinois Institute of Technology, when Mies van der Rohe was the head of the school, curriculum was influenced by the Bauhaus; the school was based on his architectural beliefs. This manifesto greatly influenced the establishment and continuing mission of the school.

Instructors' past educations and experiences refer to the specific educations the instructors received, their teaching experiences, and other work and travel. In the case of the three studios in the present study, the instructors' educations influenced how they provided education to students. Their past teaching experiences also influenced the ways they framed their teaching of aesthetics. The instructors' aesthetic preferences and aesthetic values refer to what kind of aesthetics each admires and thinks important. It relates to their hero architects' philosophies and architectural styles, and/or the theories they admire. Students' knowledge and level of architectural design and their understandings of aesthetics relate to time spent in their academic programs. The beginning students felt comfortable when the instructor dictated limits for the projects, whereas the advanced students had their own voices and wanted to freely develop their own concepts and aesthetic values. The factors correlate with and influence each other. Reviewers' comments gave alternate perspectives on aesthetics to students, and this sometimes caused clashes and confusion for students when the reviewers did not fully understand the intention or goals of the project and the pedagogy.

Figure 59 shows a theoretical framework of the process of aesthetic education in architecture studios.

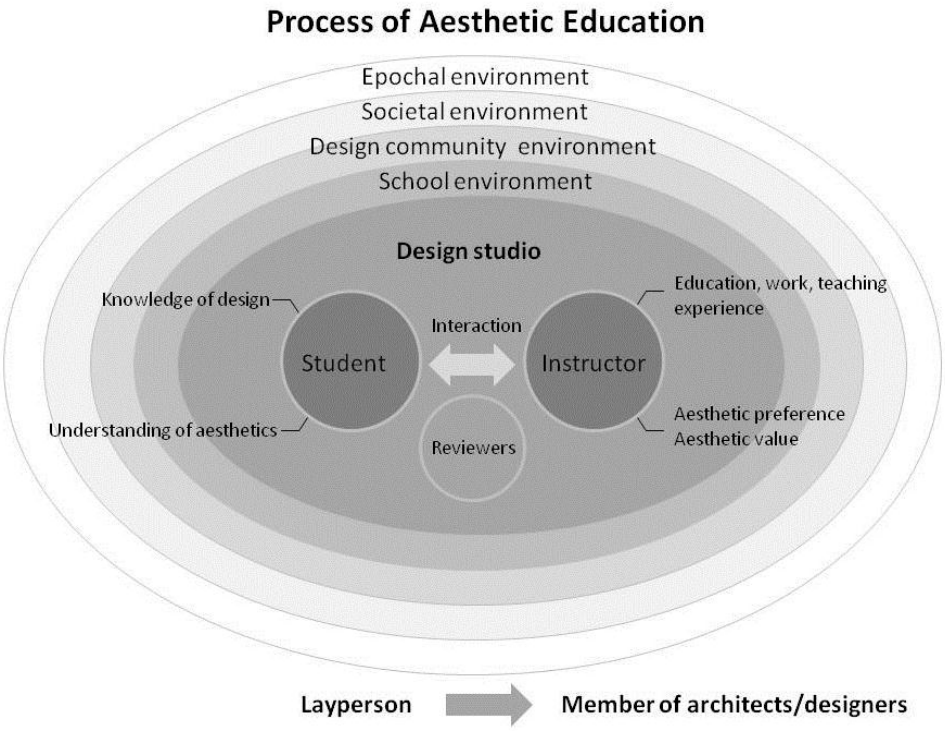

Figure 59. A theoretic framework of process of aesthetic education.

To illustrate, in one design studio, there are two representative members—students and instructor. Depending on student knowledge of design and understanding of aesthetics, as well as the instructor's past education and experience, aesthetic preference and value, the aesthetic education will occur differently. Beyond studio, there is the school environment; the school's mission and philosophy will influence studio. Beyond the school environment, there are professional societies and the culture of the design community. As a broader influence, the societal community embodies the agenda of the society overall. At the outermost boundary, the epochal environment frames the society within the zeitgeist of the era.

Aesthetics education is the sum of all these elements; if one changes, the approach to education will change too. For example, beginning students tend to be more passive in accepting the instructor's aesthetics; they are likely to have more naive aesthetic views

and attitudes of laypersons. Advanced students, on the other hand, tend to have more opinions and knowledge and have developed their own aesthetic views. With comparison of their aesthetics with the instructor's, they have the greatest potentials to accept or reject the instructor's view based on their judgment. However, through this process, students acquire knowledge and attitude, and they discover the aesthetics that are prevalent and accepted in the design community. Through this process, students open themselves to new aesthetics.

Therefore, aesthetic education can be understood as a process by which *laypersons come to belong to the society of professional architects.* Students understood aesthetic education in the design studios to be a process of acquiring visual sense, of opening their eyes to beauty, of realizing something is beautiful that was not previously considered so, and of *acculturating* to the community of architects/designers. Students learn vocabulary and terminology and thus learn through studio how to converse within the design community.

As seen in the case of studio C, some students considered iconic architecture, such as the Sydney Opera House or the Los Angeles Walt Disney Hall, to be aesthetically pleasing building but later realized that Kahn's building, quiet and non flamboyant, expresses another kind of aesthetics. They opened their eyes to the aesthetics of the design community. Through studio, students learn what contributes to the aesthetics of architecture. Schön (1987) summarized learning in studio as "the student learns to recognize and appreciate the qualities of good design and competent designing, in the same process by which she also learns to produce those qualities" (p. 102).

The conflict between instructor and students regarding aesthetics can be understood as the gap between laypersons and professionals, which has been researched in architecture, landscape architecture, and urban studies (Devlin and Nasar, 1989; Gifford et al., 2002). Such studies showed that architects' and laypersons' understanding of "high" and "popular" attributes is different. To illustrate, Devlin and Nasar found that both groups favored novelty and coherence (clarity), but architects prefer complex and high attributes and considered high architecture to be "more meaningful, clear, coherent, pleasant, and relaxing" than popular architecture (p. 342). In contrast, laypersons preferred simplistic and popular attributes and considered popular architecture to be "more meaningful, clear, coherent, pleasant, and relaxing" than high architecture (p. 342).

Other researchers argued that such a gap between architects and laypersons is the result of social impact (education) or cultural impact (Hershberger, 1988; Lang, 1987). Lang wrote:

> Environmental designers . . . are members of two cultures embedded in each other. Each has its own socialization process. One is the broader society and the other is the professional culture, which has its own norms of behavior, values, and expectations. (p. 98)

A similar voice is found in Boyer and Mitgang's (1994) *Building Community: A New Future for Architecture Education and Practice*. They proposed that architecture schools should educate students to be "effective public advocates for beauty, so that architecture's value is felt by all communities and individuals" (p. 35). Also, architectural design programs should prepare to "foster a broad appreciation of the many different ways that beauty is manifested and valued in cultures around the world" (p. 35).

Schön (1987) described the design community as practitioners' common body of knowledge—even though they differ in their expertise, they share that knowledge:

> they [practitioners] also share a common body of explicit, more or less systematically organized professional knowledge and what Geoffrey Vickers has called an "appreciate system"—the set of values, preferences, and norms in terms of which they make sense of practice situation, formulate goals and direction for action, and determine what constitutes acceptable professional conduct. (p. 33)

In summary, in this chapter, I presented the interpretation of data analysis and discussed regarding the pedagogy of aesthetics. They are (a) role of instructor in aesthetics education, (b) role of precedents in aesthetic education, (c) conflict of aesthetics in studio as a result of the interaction of aesthetic preference and emphasis on the instructor's aesthetics, (d) two realms where discussion of aesthetics of architecture occurs—as a visual object and spatial experience, (e) two natures of aesthetics that people perceive—uniqueness and fit to context, and (f) aesthetics as a value with reason and principle. As an outcome, I suggested a theoretical framework of the acculturation process whereby students come as laypersons and belong to the design community and the eight contributing components to this process. These discussions explain the pedagogy of aesthetics in architectural design studios and provide fundamental knowledge about aesthetic education in architecture school, as well as the techniques and the philosophies of the three instructors. I believe this research will help architectural design educators who desire to improve their teaching of aesthetics and students who wish to gain a broader understanding of aesthetics in architectural education. In addition, these findings may lead educators and researchers to more active discussions of aesthetics in the architectural domain.

CHAPTER VI

CONCLUSION

This chapter presents concluding remarks based on the findings and interpretation of the findings. It presents the implications of research, recommendations, limitations of the study, future research directions, and a final reflection on this research.

Implications of the Study

This study provides six implications that offer insights into the pedagogy of aesthetics in architectural education.

First, this study demonstrated that instructors and students in architectural education feel the discussion of aesthetics during studio is insufficient, and it is necessary to pay more attention to it. Participants agreed there is a tendency for some studio instructors to pay scant attention to aesthetics, and students want to have a deeper level of a discussion. Students wanted to know not only about the instructors' preferences but also about the rationale for aesthetic criticism so they could learn from it. Participants believed that the aesthetic quality of architectural design is not something achieved by fulfilling function or programming aspects only.

Second, this study showed that the studio instructor plays a unique role as practitioner, expert, and exemplar of artistry in teaching aesthetics. Students believe that meeting good instructors is significant in learning. In addition, an instructor's educational background contributes to his or her teaching philosophy and pedagogy of aesthetics. Of the instructors in this study, two received educations grounded in Bauhaus philosophy

where learning history was not offered; the third instructor received education with a postmodernist background, where there was a discussion of style and history but not the underlying principles. Their educational backgrounds influenced the methods each of them used.

Third, this study identified a theory that explains how students acquire knowledge of architectural aesthetics in design studio. It is through the artistry of the instructor's coaching. Many components contribute to this educational process: the instructor's past education and working and teaching experience; aesthetic preference and value; students' level of design knowledge and understanding of aesthetics; the school environment; the design community environment as professional societies; the societal environment; and the epochal environment. This theory shows how aesthetic education is positioned in the broad realm of design education and is framed by the interaction of those components in design studio.

Fourth, this study indicates there are two main perspectives regarding the nature of aesthetics. Some prefer a unique design that is attractive from the exterior, whereas others consider that aesthetics apply to the interior quality and experiential aspects of space. This study delved further into perspectives of architectural beauty and explored whether it lies in the visual object or in the spatial qualities. It is apparent that aesthetics in architecture cannot be considered separately from functional, structural, and psychological aspects and human experience. Because design is multifaceted and complex, the aesthetic aspect is intertwined with other aspects in desk critiques and other discussions.

Fifth, this study identified the nature of aesthetics in architecture design. Aesthetics, specifically in education, has to be approached as having value and a normative nature; but it also requires a certain discussion of principle/reason. Students want to know the rationale for their instructor's comments on aesthetics so they can use the information to learn aesthetic principles.

Sixth, this study indicated there are two approaches in design education based on the use of precedents: emphasis on exploration versus emphasis on discipline. The exploratory approach allows students to have freedom to pursue their concepts and design aesthetics in an open environment whereas the disciplinary approach can guide students' design processes more effectively by offering inputs and limitations. However, when teachers adhere too rigidly to the prescriptive approach, students feel pressure and their freedom to be creative is limited. Yet when teachers do not use the prescriptive approach at all, students tend to have difficulty starting a project and easily become overwhelmed by the design process. Thus, there needs to be a balance between students' levels of knowledge and the limits given them with each design project. In addition, architectural education is a process, a journey wherein laypersons become architecture/design professionals. By recognizing the educational process as facilitating this transition, educators will gain a holistic view of design education.

Recommendations to Educators

This research offers several recommendations to design educators.

Educators may need to know that aesthetics is neither concrete knowledge nor a taste or preference. Aesthetics is a value, but teaching someone about it requires

explanation of the underlying principle/rationale. Yet participants agreed that too much emphasis on the programming aspect often led to a loss of opportunities for considering aesthetics. Moreover, educators need to understand that the process of aesthetic education in architectural design is one way a layperson comes to relate to the professional community; this is known as *acculturation*.

Educators also need to know of the possibility of a clash of aesthetics between instructors and students, especially advanced-level students. When instructors overemphasize their own aesthetic preferences and impose them in studio, the students feel pressured and do not feel a strong attachment to or ownership of their own projects. However, students wanted to know their instructor's view of aesthetics even when it differed from their own. Rather than imposing one's aesthetics, suggesting precedents with an explanation of principle and rationale will preserve students' right to find and develop their own aesthetics.

In addition, educators need to consider the students' knowledge levels in studio instruction, especially as it pertains to teaching the design process. When the design instructor presents studio projects with a very unconventional approach and deals with architecture as artwork to advanced graduate students, students tended to feel confused. Design reviewers could worsen the conflict when they do not understand studio instruction.

Architectural design education is a process of not only learning external, formal, and expert knowledge such as technology or structure, but also a process of gaining personal knowledge, such as normative aesthetic value and the eye to discern beauty. Design studio is a place where students can be exposed to great works of architecture.

Thus, educators need to know the diverse usage of precedents in the design process to enhance student understanding of aesthetics in architectural design.

In addition, educators may need to recognize the uniqueness of the design studio instructor's role; it differs from that of instructors in other domains because the teaching is customized to fit each student. The role of the instructor in design education is very significant, because it is through the instructor's example and use of language, vocabulary, and articulation, rather than from textbooks or exams, that students learn the community and society of architectural design. Thus, educators need to recognize this significant role of studio instructors, and approach the study of pedagogy by acknowledging uniqueness of design, with its uncertainties and complexities.

Given that beginning design instructors often feel a lack of reference for design studio teaching, and in many cases, they depend only on their own experiences, the findings from this study may give useful insights for their teaching practices.

Limitations of the Study

There are several limitations to this study. First, because this case study was conducted in only three design studios, it is difficult to generalize the findings as common phenomena. This study was conducted in three midwestern universities in the United States; thus, if I researched design studios consisting of different students in a different region or with a different cultural background, the findings might be different; the instructors' teaching methods and pedagogies might be different; other issues might be more prominent than in this study; and I might find some different phenomena from those of this study.

The second limitation is the existence of a lack of continuity and flow. Due to limited time and my distance from the schools (i.e., the round-trip drive took 4 hours), the observations were conducted basically once per week, and it was impossible to perfectly understand what was going on in each studios. There may have been some issues or events I missed and are thus unknown. In addition, because design is cognitive activity, it was impossible to fully track design development through behavioral and graphical observation. Some observation audio files were very hard to understand due to the noise in the background, particularly in an open studio that other section students also use together. I tried to overcome this limitation by actively using field notes. In order to fill any gaps in understanding the continuity of the design process, I took photos of student designs in each stage of development and had frequent conversations with students about their design changes.

The third limitation is language; because I am not a native English speaker, when interpreting and analyzing the participants' discussions during observations and interviews, I may not have completely understood subtle meaning differences, if any. I responded to this limitation with assistance from students who are native English speakers. I asked them to check my transcriptions of the data. I rechecked their files against the original audio files and compared those against my field notes. In addition, some data hard to hear due to noisy background were transcribed by students who are native English speakers. In those cases, I checked the transcribed file against the original audio file in order to check precision and to remind me of the situations and events that I had observed; and I read the transcribed data repeatedly in order to capture the original meaning.

The fourth limitation is that the teaching methods the instructors used might be different in another semester and with another group of students. Even if the instructors use the same method with all students, different students may elicit a different aesthetic response from the instructors. In addition to the instructor's comments, other aspects such as reviewers' comments and peer interaction may influence students' design evolutions. However, I did not consider those aspects much because reviewers' comments and peer interactions with students were not the main concern of this study

Another possible limitation lies in the participants' differing articulation abilities. Because the level of students differs (seniors in undergraduate in studio A, advanced graduate students in studio B, beginning students in graduate school in studio C), some students were less knowledgeable than others and may not have been able to articulate their idea/opinions sufficiently. Because the term *aesthetics* is hard to define and discuss, it might be possible that participants did not all have the same understanding of the term.

However, the goal of this study was, rather than generalizing the findings, understanding the pedagogy of aesthetics as it specifically pertains to three excellent studio instructors. Given that there is no theory explaining the process of aesthetics in architectural education, I believe this study contributes to identifying the pedagogy of aesthetics by examining the teaching philosophy of aesthetics, teaching method of aesthetics, the process of aesthetics, and the perception of aesthetics and aesthetic education in contemporary architectural education.

Future Research Directions

The following areas should be considered for future research.

First, a study of aesthetic education that involves beginning level students would be beneficial in understanding the nature of aesthetic education. Even though this research studied beginning graduate students who did not have any architecture training, they were older students eager to become architects, so they may have obtained some informal knowledge of the field. A critical review of the beginning undergraduate students' studios would further reveal the effectiveness of aesthetic education in architectural education.

Second, the relationship between aesthetic preference and year in architecture school would provide insight to design educators. In addition, a study on how students' aesthetic preferences change through the school year would expand understanding of the effect of education. For example, researchers can recruit freshmen architecture undergraduates and ask them to sort the order of building photos according to their preferences. Later, when the students become seniors, go through the same study again and look for changes. If there are changes, researchers can investigate what they are and whether they are common to most students.

Third, a study of the relationship between aesthetic preference and individual differences (e.g., cultural, educational and gender differences) would reveal factors that contribute to different aesthetic preferences. A study of why some people prefer the preference-novelty model and other favor the preference-prototype would contribute to further understanding perceptions of aesthetics. In addition, future research should focus

on the study of the nature of aesthetic discussion and alternative expressions of aesthetic concepts.

Researcher Reflection

As a researcher, I hope that this study brings attention to more active discussions of the pedagogy of aesthetics in architectural education. As a design studio instructor and designer, I have had ongoing questions about whether the current level of discussion of the aesthetic aspects of architecture is sufficient for students. During my 10 years as a designer, I became aware of the greater difficulty in giving feedback on others' design solutions in terms of aesthetics than on aspects such as function or structure. It was not easy to explain or be persuasive about a critique of the aesthetic aspects of design. Sometimes a critique of aesthetics caused unnecessary tension and conflicts.

The term *aesthetics* itself is difficult to describe and is not used much in everyday life, and from Vitruvius' triad, it is not clear whether it is adequate to say that *venustas* represents the aesthetic aspects of architecture. Aesthetics is inseparable from other aspects of architecture, and due to that quality in architecture, it was a long journey for me to identify what aesthetics actually means in architecture education.

It is a common notion that beauty is in the eye of the beholder, so discussion of beauty is, in many cases, left to individuals; this is often true in education. In addition, discussing principles of certain beauty is often considered impossible because beauty is understood as taste. However, in education, it is a worthy of inquiry to understand how discussions of aesthetics arise in order to provide better aesthetic education and articulation to students.

Thus, as the study comes to a close, I hope that the descriptions of pedagogy of aesthetics—teaching methods, process of aesthetic education, and perceptions of aesthetics and current aesthetic education in architectural education discussed herein can offer implications to design studio instructors. In addition, I hope the students' voices are heard carefully for the advancement of design education in the discipline of architecture and interior design.

APPENDIX A: CONSENT FORM

Consent form for studio C

Researcher's name: Ji Young Cho
Researcher's contact information: 404-422-4077, jyc5w9@mizzou.edu

Project title: Understanding the way of aesthetic education in architectural design studio: How do instructors teach aesthetics and influence students' design results?

Hello. I am a doctoral candidate at the Department of Architecture Studies at the University of Missouri, Columbia. You are being asked to participate in a research study. This research is being conducted to understand aesthetic education in architectural design studio. As a study participant you have the right to know about the procedures that will be used in this research study so that you can make the decision whether or not to participate. The information presented here is an effort to make you better informed so that you may give or withhold your consent to participate in this research study.

The focus of my study is to understand how aesthetic education occurs in architectural design studio - how instructors talk about aesthetics and how the discussions influence students' design results. This will be one part of my dissertation.

Your participation in this study will include two areas: my observations of your design studio and individual interview. Total period will be about one month of 2009 summer semester (June 9th – July 3rd). First, I will observe your discussions with your instructor in studio regularly (total, 10 times). It will include your discussion with reviewers in the design critique. Second, I will interview you individually (total, two times for 20 minutes) to understand your perspective about discussion with your instructor in terms of aesthetics and its influence on your design. The discussion and interview will be audio-recorded. If you agree, I will take some photographs of your sketch, modeling, drawing, and final presentation board in order to understand your design process and the evolution of your project.

Your participation will benefit the development of architectural education by providing fundamental knowledge of role of aesthetic discussion in architectural education.

Data gathered during this participation will be kept confidential to the extent allowed by law. Your participation in this study is not expected to cause any harm because your identities will be kept secret. The confidentiality of all studies related records would be maintained in accordance with State and Federal laws.

Participation in this study is voluntary. You do not have to participate in this study. If you decide to participate, you can change your mind and drop out of the study at any time. If you have any questions you may give me a call at (404) 422-4077 or e-mail to jyc5w9@mizzou.edu. You may also ask questions or state concerns to the University of Missouri, Columbia Campus Institutional Review Board (IRB), at (573) 882-9585 (http://research.missouri.edu/cirb/). Please note that you may withdraw from the study at any point, without any prejudice.

Thank you very much.

Ji Young Cho.

_____
Participant's Name

_____
Participant's Signature / Date

APPENDIX B: Category and Code Definitions from Instructor Interview

Category	Code	Definition
Instructor's education	Education in aesthetics	Discussion related to instructor's received education regarding aesthetics
	Length of teaching	Discussion related to length of the instructor's teaching experience
	Influence of learning	Discussion related to the influence the interviewee's learning about aesthetics had on teaching
	Influential teacher	Discussion related to teacher(s) who influenced instructors in regard to aesthetics
	School environment	Discussion related to the environment of the school where the instructor received architecture education
Other experience	Travel experience	Discussion related to instructor's travel experience
	Work experience	Discussion related to instructor's work experience
Curriculum	Courses related to aesthetics	Discussion related to courses that provide instruction in aesthetics
	Courses devoted to aesthetics	Discussion related to courses devoted to aesthetics that instructors want to have in their curriculum
	Differences in aesthetics	Discussion related to differences/similarities between past and current aesthetics in architecture
	Reasons for differences in aesthetics	Discussion related to reasons for such differences/similarities
	Differences in aesthetic education	Discussion related to differences/similarities between past and current approaches to teaching aesthetics
	Reasons for differences in aesthetic education	Discussion related to reasons for such differences/similarities
	Overall emphasis on aesthetics in curriculum	Discussion related to degree to which aesthetics is emphasized in overall curriculum in architectural education
Studio project	Emphasis on aesthetics	Discussion related to degree to which aesthetics is emphasized in studio
	Focus of project	Discussion related to focus of the studio project
Perception	Alternative expression of aesthetics	Discussion related to alternative expressions for aesthetics instead of saying directly 'aesthetics'
	Nature of aesthetics	Discussion related to nature of aesthetics that instructors perceive—from what aspects they discern aesthetic quality
	Nature of aesthetic education	Discussion related to instructors' understandings of current aesthetic education
	Realms of aesthetic discussion	Discussion related to realms in which aesthetic

		discussions occur
	Reasons for lack of aesthetic education	Discussion related to reasons for lack of aesthetic education
Teaching Philosophy	Teaching philosophy of aesthetics	Discussion related to instructor's teaching philosophy of aesthetics
Teaching Method	Teaching method of aesthetics	Discussion related to instructor's method of teaching aesthetics
	Teaching method for weak students	Discussion related to method to deal with weak students in terms of aesthetics
	Teaching method for strong students	Discussion related to method to deal with strong students in terms of aesthetics
	Rationale for teaching method	Discussion related to reasons for using observed teaching method

APPENDIX C: Category and Code Definitions from Student Interview

Category	Code	Definition
Background	Studio experience	Discussion related to the number of studios students took
	Undergraduate major	Discussion related to students' undergraduate majors
Curriculum	Courses related to aesthetics	Discussion related to courses that provide instruction in aesthetics
	Courses taken related to aesthetics	Discussion related to course names that students had taken related to aesthetics
	Desired courses relating aesthetics	Discussion related to courses that students would like to take to learn about aesthetics
	Overall emphasis on aesthetics in curriculum	Discussion related to degree to which aesthetics is emphasized in overall curriculum in architectural education
Studio project	Agree with instructor's opinions	Discussion related to degree of agreement to instructor's opinions overall
	Emphasis on aesthetics	Discussion related to degree to which aesthetics emphasized in studio
	Favorite assignments	Discussion related to specific assignments that students prefer among the studio projects
	Focus of project	Discussion related to focus of the studio project
	Lessons from the studio	Discussion related to what students learned from the observed studio in aesthetics
Perception	Nature of aesthetics	Discussion related to nature of aesthetics that instructors perceive – from what aspects they discern aesthetic qualities
	Nature of aesthetic education	Discussion related to students' understanding of current aesthetic education
	Preferred building	Discussion related to students' favorite buildings in terms of aesthetics
Phenomena of studio	Change of understanding of aesthetics through studio	Discussion related to change of students' understandings of aesthetics through the studio
	Clash with instructor	Discussion related to clash/conflict with instructor regarding aesthetic preference
Perception of studio instructor	Good features of the instructor	Discussion related to good features of students' current design studio instructor
	Weak features of the instructor	Discussion related to weak features of students' current design studio instructor
	Ideal design studio instructor	Discussion related to characteristics of students' ideal design studio instructor
	Features of instructor compared	Discussion related to features of their instructor that are different from those from professors in other

	with other domains	domains
	Helpful teaching method	Discussion related to teaching method that students think most helpful regarding aesthetic education

APPENDIX D: Category and Code Definitions from Observations

Category	Code	Definition
Nature of aesthetics	Breaking symmetry	Aesthetics in breaking symmetry and less symmetrical shape
	Consistency/Coherence	Aesthetics as something consistent and coherent
	Composition	Aesthetics as something well-composed
	Contrasts	Aesthetics as something with contrast
	Fit to context	Aesthetics as something fit to its context
	Focal points	Aesthetics as something focal point
	Holistic aspects	Aesthetics as something that has integrated components
	Meaningfulness	Aesthetics as something of which meaning/makes sense to certain people
	Non-literalness	Aesthetics as something not literal (something too literal lacks aesthetic qualities)
	Poetics	Aesthetics as something that is poetic and elegant
	Small palettes	Aesthetics as something with a small range of palette
	Spatial ambiguity	Aesthetics as something ambiguous in space
	Special aspects	Aesthetics as something special and extraordinary
	Stand out aspects	Aesthetics as something that stands out from the background
	Uniqueness	Aesthetics as something unique
	Variety of space	Aesthetics as something varied space
Alternative expressions of aesthetics	Appearance/look	Tendency to say "appearance or looks" of a design instead of "aesthetics" of a design
	Beauty	Tendency to say "beauty" of a design instead of "aesthetics" of a design
	Form/shape	Tendency to say "form or shape" of a design instead of "aesthetics" of a design
	Goodness	Tendency to say "what I think is good" about a design instead of "aesthetics" of a design
	Impression	Tendency to say "what impresses me" about a design instead of "aesthetics" of a design
	Interesting aspects	Tendency to say "what is interesting" about a design instead of "aesthetics" of a design
	Intriguing aspects	Tendency to say "what is intriguing" about a design instead of "aesthetics" of a design
	Organizing principle (Ordering idea)	Tendency to say "organizing principle" of a design instead of "aesthetics" of a design

	Pleasing	Tendency to say “what pleases me” about a design instead of “aesthetics” of a design
	Powerfulness	Tendency to say “what is powerful” about a design instead of “aesthetics” of a design
	Preference	Tendency to say “what I like or prefer” about a design instead of “aesthetics” of a design
	Proportion	Tendency to say “proportion” of a design instead of “aesthetics” of a design
	Richness	Tendency to say “richness” of a design instead of “aesthetics” of a design
	Vocabulary/language	Tendency to say “vocabulary and language” of a design instead of “aesthetics” of a design
Realms of aesthetic discussion	Color	Color of certain elements in building
	Concept-form match	Student’s concept-form match in architectural design
	Detail	Detail of elements in building
	Exterior	Outside surface of building
	Facade	Facade of building
	Finish	Finishes of certain elements in building
	Geometry	Geometry of certain elements in architectural design
	Intention	Student’s or designer’s intention in architectural design
	Interior space	Inside part of building
	In-between space	negative space between building segments
	In-out connections	Aesthetics as well-connected relationship between interior and exterior of building
	Lighting	Lighting introduced in building
	Material	Materials of certain elements in building
	Module	Module as self-contained unit in architectural design
	Presentation board	Presentation board prepared for design review
	Scale	Scale of building as a whole or certain elements in architectural design
	Sequence	Sequence of movement in architectural design
	Spatial experience	Spatial experience in architectural design
	Spatial organization	Spatial organization in architectural design
	Tactility	The potential of element(s) of a building to stimulate sense of touch
Studio project	Emphasis on aesthetics	Degree to which aesthetics are emphasized in observed studio
	Focus of project	Focus of the studio project in the observed studio

Teaching method of aesthetics	Articulation	Ability of instructor to articulate student's ideas and expressions
	Clarification of student talking	Ability of instructor to clarify what student says
	Customization	Ability to tailor instruction to each student, fit to the student's design development and characteristics of the student's design
	Emphasis on model making	Instructor's emphasis on model making in studio
	Emphasis on section	Instructor's emphasis on drawing section in studio
	Encouragement	Encouragement that instructor gives to students to do well
	Explanation in detail	Explanation that instructor gives about a certain topic in detail
	Feedback and guidance	Feedback and guidance that instructor gives to student projects
	High expectations and standard	High expectations that instructor has toward student projects
	Principle and prototype	Ability of instructor to show principle and prototype of elements of architecture
	Precedent–visual	Use of precedents in visual format (e.g., drawing and photos of certain buildings)
	Precedent-verbal	Use of precedents in verbal format (e.g., storytelling, introduction of architect concepts)
	References /examples	References and examples that instructor gives to students
	Reading student design intention	Ability of instructor to read student's design intention quickly
	Unique approach	Use of unique approach in studio project
	Use instructor's interest	Use of instructor's interest in course content
Phenomena in aesthetics	Clash between instructor and students	Clash/conflict between instructor and students regarding aesthetic preferences
	Revelation of instructor's aesthetics	Instructors' aesthetics revealed through discussion
	Review of function first	Tendency to look for whether the project fulfills function and then search for aesthetics

APPENDIX E: Final Themes, Categories and Codes

Final themes, categories and codes were developed through comparative analysis—three studios and three data collection methods (interview, observation, and visual material review).

Category	Sub category	Code
Participants characteristics	Instructor's education	Education in aesthetics
		Length of teaching
		influence of learning
		Influential teacher
	Other experience	Travel experience
		Work experience
	School environment	School environment
	Student background	studio experience/level of knowledge in studio
		Undergraduate majors
Studio structure	Studio project	Emphasis on aesthetics
		Focus of project
		Favorite assignments
	Student-instructor interaction	Agree with instructor's opinions
		Lessons from the studio
Curriculum	Courses	Courses related to aesthetics
		Courses taken related to aesthetics
		Courses devoted to aesthetics
		Desired courses relating aesthetics
	Changes of aesthetics	Differences in aesthetics
		Reasons for differences in aesthetics
	Changes of aesthetic education	Differences in aesthetic education
		Reasons for differences in aesthetic education
	Emphasis on curriculum	Overall emphasis on aesthetics in curriculum
	Nature of aesthetic education	Reasons for lack of aesthetic education
		Nature of aesthetic education
Teaching philosophy and method	Teaching philosophy	Teaching philosophy of aesthetics
	teaching method	Teaching method for strong students
		Teaching method for weak students
		Rationale for teaching method
	Teaching method of	Teaching method of aesthetics

	aesthetics	Articulation
		Clarification of student talking
		Customization
		Emphasis on model making
		Emphasis on section
		Encouragement
		Explanation in detail
		Feedback and guidance
		High expectations and standard
		Principle and prototype
		Precedent–visual
		Precedent-verbal
		References /examples
		Reading student design intention
		Unique approach
		Use instructor's interest
Perspective on instructors' teaching methods	Students' perspective of studio instructor	Good features of the instructor
		Weak features of the instructor
		Ideal design studio instructor
		Features of instructor compared with other domains
		Helpful teaching method
Perception	Nature of aesthetics	Nature of aesthetics
		Breaking symmetry
		Consistency/Coherence
		Composition
		Contrasts
		Fit to context
		Focal points
		Holistic aspects
		Meaningfulness
		Non-literalness
		Poetics
		Small palettes
		Spatial ambiguity
		Special aspects

		Stand out aspects
		Uniqueness
		Variety of space
	Preferred building	Preferred building
	Alternative expressions of aesthetics	Appearance/look
		Beauty
		Form/shape
		Goodness
		Impression
		Interesting aspects
		Intriguing aspects
		Organizing principle (Ordering idea)
		Pleasing
		Powerfulness
		Preference
		Proportion
		Richness
		Vocabulary/language
	Realms of aesthetic discussion	Realms of aesthetic discussion
		Color
		Concept-form match
		Detail
		Exterior
		Facade
		Finish
		Geometry
		Intention
		Interior space
		in-between space
		In-out connections
		Lighting
		Material
		Module
		Presentation board
		Scale

		Sequence
		Spatial movement
		Spatial organization
		Tactility
Phenomena of studio	Clash of aesthetics	Clash between instructor and students
		Revelation of instructor's aesthetics
		Review of function first
	Effect of aesthetics	Change of understanding of aesthetics through studio

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