The architectural design studio as a learning environment: a qualitative exploration of architecture design student learning experiences in design studios from first- through fourth-yea

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The architectural design studio as a learning environment: A qualitative exploration of architecture design student learning experiences in design studios from first- through fourth-year

by

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# TABLE OF CONTENTS

LIST OF FIGURES vi

ACKNOWLEDGEMENTS vii

ABSTRACT ix

CHAPTER 1. INTRODUCTION 1
   The culture of Architectural Education and the Architectural Design Studio 2
   Rationale 11
   Problem Statement 12
   Purpose of the Study and Research Questions 13
   Theoretical Framework 14
      Constructivism, social constructivism, and constructionism 14
      Chickering’s theory of student development 17
   Significance and Implications 19
   Limitations of the Study 20
   Relevant Definitions and Descriptions 20
   Architecture Terminology 21
      The Dimensions of the design studio 21
      Studio education at ISU, the College of Design and the architecture department 23
         First-year architecture/the core foundations program 23
         The second-, third-, fourth-year of architecture study 24
         The fifth-year architecture option studios 25
      The projects or assignments 26
      Juries/critiques/reviews/pin-ups 27
      The culture of architectural education and the design studio culture 27
   Education Terminology 28
      Constructionism 28
      Constructivism 28
      Learning 28
      Learner-centered 28
      Learning environment 28
      Learning experiences 29
      Phenomenology 29
      Social constructionism 29
      Social constructivism 29
   Summary and review of the dissertation 29

CHAPTER 2. LITERATURE REVIEW 31
   Learning 33
      A common learning theory used in architectural education 35
      Constructivism and other learning theories 37
Reflexivity
Trustworthiness
Summary

CHAPTER 4. FINDINGS
Description of the Participants
Clare
Monica
Judy
Luke
Michael
Research Questions
Themes Emerging From Data
Interrelations
Self-driven learning experiences
Discussion of self-driven learning experiences
Interdependent learning experiences
Student-to-student interaction
Professors
Discussion of interdependent learning experiences
Transitions
First- and second-year: Confusing/frustrating
Third-year: Challenging/frustration and clarity
Fourth-year: Clarity/Transitional
Summary of transitions
Experiential Outcomes
The collective process
Learning through critical reflection
Creation of a vision
Honing a way of working
Summary of Experiential Outcomes
Summary of Domains and Categories
Learning experiences: Interrelational
Progression in the experiences of learning: Transition
The outcomes and incorporation of learning experiences

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, REFLECTION
Discussion
Interrelations
Self-driven learning experiences
Interdependency
Learning experiences as transitions
Outcomes of Learning Experiences
Collective process
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning through critical reflection</td>
<td>170</td>
</tr>
<tr>
<td>Creation of a future vision</td>
<td>172</td>
</tr>
<tr>
<td>Honing a way of working</td>
<td>174</td>
</tr>
<tr>
<td>Summary and Questions Answered</td>
<td>177</td>
</tr>
<tr>
<td>Limitation and Strengths</td>
<td>179</td>
</tr>
<tr>
<td>Implications for Practice</td>
<td>180</td>
</tr>
<tr>
<td>Recommendations for Further Research</td>
<td>184</td>
</tr>
<tr>
<td>Personal Reflection</td>
<td>186</td>
</tr>
</tbody>
</table>

APPENDIX A: 2004 & 2007 ENROLLMENT MANAGEMENT RITERIA FOR THE COLLEGE OF DESIGN & ARCHITECTURE DEPARTMENT 190

APPENDIX B: A MODEL OF THE DESIGN STUDIO INTERACTION 192

APPENDIX C: APA 14 LEARNER-CENTERED PSYCHOLOGICAL PRINCIPLES 193

APPENDIX D: INFORMED CONSENT DOCUMENT 198

APPENDIX E: EXAMPLES OF QUESTIONS 201

REFERENCES 202
LIST OF FIGURES

Figure 1. Summary of Participants in the Study  

Figure 2. Interrelational Learning Experiences Students had in the Architectural Design Studio  

Figure 3. Web of Learning Experiences  

Figure 4. A Model of Design Studio Interaction
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ABSTRACT

This qualitative study addresses the design studio learning experiences of fifth-year architectural students, from their first year to their fourth year. It discusses the descriptions that architecture students give to the learning experiences, describes the perceptions that design students have of their learning experiences, and illuminates the outcomes of these learning experiences. The findings show that the students described their learning experiences as interrelational, perceived the experiences as transitional, and felt that their learning experiences aided in the production of outcomes. The findings were viewed within social constructivist and constructionist viewpoints and were contingent on Chickering and Reisser’s model of student development. Since studio culture is generated partially by a student culture that encompasses interaction, these learning experiences are also affected by interaction. This study explores the meaning students make of their learning experiences in the design studio, which are affected by this interaction.
CHAPTER 1
INTRODUCTION

This study looks at the architectural design studio using a phenomenological, qualitative approach. Using data collection and analysis methods from phenomenology, within social constructivist and constructionist theoretical perspectives, this work describes how fifth-year architecture students in the architecture department at Iowa State University describe and make meaning of learning experiences in their design studios from their first year to their fourth year. Chickering and Reisser’s theory of identity development is also an important lens through which the findings are viewed, aiding in the description of student development due to learning experiences in the design studio.

Constructivism, a learning theory that explains interaction and how people understand and make sense of their world through their perception of reality and their interaction with their surroundings (Berger & Luckmann, 1966; Bruner, 1990; Derry, 1999; McMahon, 1997; Papert, 1991; Vygotsky, 1978), has influenced several other learning theories and perspectives. Some of these relevant learning theories, especially social constructivism and constructionism, are discussed in the literature review. These perspectives help frame this inquiry and are used as a lens to view the design studio learning environment.

Individual in-depth interviews and a focus group, drawing on stories and particularly focusing on the students’ lived experiences in this milieu, were used as data collection methods to better understand the architecture design studio learning environment. Although a body of research exists about learning in a variety of learning environments such as lectures, seminars, laboratories, and other normative types of classrooms, similar work has not been done for studio teaching. Therefore, this work explored the architectural design studio as it
exists at Iowa State University, and it identified how learning was experienced from the first year through fourth year. It also investigated some of the factors that might possibly affect *learning experiences* in architectural education and, ultimately, explored the outcomes of learning experiences in the architecture studio culture as perceived by the student participants in this study. Although physical outcomes, such as the products that students produce to fulfill assignment requirements are important, this study focused on the participants’ experiential perceptions as outcomes.

The analysis and findings presented in chapter 4 show that participants in the designated setting described their learning experiences through interrelations, perceived their learning experiences through transitions, and also described the experiential outcomes of their learning experiences. How students interact with one another, both academically and socially, is an example of a theme that can be categorized under interrelations. An example of a transition, which is moving from one perception to another, is moving from a perception of confusion to clarity. Interrelations, transitions, and experiential outcomes are, therefore, the domains that overarch the categories and themes that emerged from the data.

To lay the foundation and to help accomplish the task of understanding the architectural design studio and student perceptions, the culture of architectural education and the architectural design studio culture need to be defined and described and a body of literature on learning needs to be understood, specifically focusing on how students learn and experience learning in learning environments.

**The Culture of Architectural Education and the Architectural Design Studio**

There are many types of educational settings and pedagogical approaches in education, from lecturing in a large hall or auditorium, to small informal seminar spaces and highly
specialized environments such as laboratories. Different disciplines may rely or privilege certain settings and or approaches over others. For example, many disciplines in the sciences emphasize lab teaching and learning experiences, while education in the arts has largely been based on the studio environment.

A studio is a workspace where students explore a set of skills with or without the presence of an instructor. The instructor in this case works with students during designated class time and then students continue to work on their own to develop their work. Corona-Martínez (2003) said the following about the design studio:

Design studio is where a student learns to design; and design is considered the key activity for an architect. Therefore, the studio is the most important piece in the set of subjects. It is the essential activity offering the main chance for the future architect to become a good designer. (p. 42)

Additionally, Ledewitz (1985) described the architectural design studio as a physical environment where students are primarily taught three aspects of design education: (a) “a new language,” (b) “a number of new skills such as visualization and representation” (p. 2), and (c) architectural thinking. Individual work in the design studio and also the interaction of students in the absence of the instructor is seen as an important part of the education of the architect in many schools, and this dynamic is usually referred to as the “studio culture.”

Recently, there have been some formal discussions of this “studio culture” within architectural education (AIAS Studio Culture Task Force, 2002; Anthony, 2001; Dutton, 1984). For instance, the AIAS Studio Culture Task Force described aspects of the “design studio culture” that include both negative and positive characteristics of the design studio. Their descriptions, however, could refer to either the culture of architectural education or the
culture of the architectural design studio. While the culture of architectural education involves the use of the design studio to educate students and the use of a particular teaching pedagogy depending on the institution, the architectural design studio culture is generated partially by a student culture that encompasses teaching pedagogy and actions of and interactions among students. The architectural design studio culture also functions as a classroom when a faculty member is present, but the studio also can function in the absence of the instructor because the concept of the design studio is for students to continually work on projects in their studio. Gross and Do (1998) described the architectural design studio as follows:

Traditionally the practice of architectural design is learned through a project-based “studio” approach. In studio, designers express and explore ideas, generate and evaluate alternatives, and ultimately make decisions and take action. They make external representations (drawings and three-dimensional models) and reason with these representations to inquire, analyze, and test hypotheses about the designs they represent. Through the linked acts of drawing, looking, and inferring, designers propose alternatives, and interpret and explore their consequences. In their sketches architects find visual analogies, recall relevant examples, and discover new shapes and geometric configurations. They use the representations to test their designs against a-priori performance criteria. And in the highly social environment of the design studio students learn to communicate, to critique, and to respond to criticism, and to collaborate. (p. 1)

While this student-to-student and instructor-to-student interaction provides an environment that some scholars believe offers beneficial learning experiences in terms of
pedagogy (Anthony, 1991; Boyer & Mitgang, 1996), others contend that it can also support negative student experiences such as “student isolation” and poor “student work habits” (AIAS Studio Culture Task Force, 2002, p. 7). Another important pedagogical role of the studio for many educators is that it should function as the place where students are meant to integrate the content and skills from their other classes. Although ongoing disagreements exist about how the design studio functions as the primary educational mode in architecture, it remains the mode preferred by architectural departments throughout North America (Corona-Martinez, 2003; Lawrence & Hoversten, 1995; Stevens, 1998).

In 2002 a student lost his life in a car accident while driving home after a long night in studio. The cause of the accident was attributed to lack of sleep (ArchVoices, 2005). This incident prompted the American Institute of Architects Students (AIAS) to form a task force to look into studio education and studio culture. As the student branch of the major professional organization for architects in the United States, the American Institute of Architects (AIA) is a positive voice for students in the educational and the professional practice setting in the United States. Since the design studio is an important feature in many design education programs, the AIAS Studio Culture Task Force set out to identify both the beneficial characteristics or key aspects of “studio culture” as well as potentially dangerous experiences.

Although the AIAS task force was formed as a result of a tragic event, the group recognized many positive aspects of the culture of architectural education:

1. The “potential for integrative learning” in the design process (AIAS Studio Culture Task Force, 2002, p. 10). Architecture students have the potential of having a broad knowledge base, and the integration of knowledge is valued.
2. The design process in the design studio. This is usually accomplished through a hands-on learning process, through project-based assignments. This process allows students to think, learn, and do at the same time (AIAS Studio Culture Task Force, 2002).

3. Student-to-student learning. In design studio, students share a sense of camaraderie and respect. The environment provides an appropriate space and access to tools and equipment that some students might otherwise not have access to.

4. Structures of studio learning. Here, structure means the way that studio is run. Usually a power differential between the student and the teacher is evident, design studio takes up most of the students’ time (Stevens, 1998), and each studio is run differently by different professors, discouraging consistency (AIAS Studio Culture Task Force, 2002). Although this is a positive aspect, it can also be viewed as negative because of the norm of teaching in higher education by creating consistency for students. On the other hand, being unique is a quality that is encouraged in the design studio environment, giving students the opportunity to understand differences and make choices based on those differences.

The AIAS task force and other scholars have also identified the following negative key aspects of the design studio environment:

1. Unhealthy student health and work habits. This includes behaviors such as “all-nighters” and “exacto knife scars” (p. 7). These seemingly negative experiences become a source of pride for many students (Fisher, 2001).

2. Student isolation. Student isolation creates a concern that students have a false sense of the world. Moreover, architecture students spend most of their time with people in their discipline, making the “outside world” less important (Anthony, 1991; Boyer & Mitgang, 1996).
3. Design studio as the master value. With a mindset holding design studio as the most important course, students may disregard other courses and focus solely on the studio. This isolation is both intellectual and physical (AIAS Studio Culture Task Force, 2002) because students are so focused on design studio as being the most important course.

4. False sense of practice expectations. Despite their potential, architecture students graduate from college with a false sense of the knowledge they have gained. They expect to design buildings when they graduate, and their employers expect them to produce drawings of buildings that have already been designed. Often, new graduates become a source of labor and not ideas (Gutman, 1997). This idea is also perpetuated in the design studio where students with the “best” ideas and designs, who are labeled as independent stars, are praised. Although teamwork is also valued in the design studio, the independent star gains reputation, as opposed to the team.

5. Design as competition. In some design studios, teachers and students, and students themselves, struggle to gain control of the learning environment because everyone has their own opinions on design (Argyris, 1981). Also, Anthony (1991) talked about design competition being fostered by design education, between students. This competition causes the tension of having to perform better, design-wise, between the students, even though they are also expected to be learning from and teaching each other, and at the same time sometimes collaborating and trying to be friends with each other because of the amount of time spent together (Dutton, 1984; Ward, 1989).

6. Lack of a broad liberal arts and or interdisciplinary education. Often, the connection that architecture students have to other disciplines is not sufficient to broaden their knowledge base (Boyer & Mitgang, 1996). Most architecture programs in North America require a
large number of credits to complete the degree, but because of the accreditation requirements, or how they have been interpreted, most of these credits fall within the architecture discipline. So, students do not have a broad liberal arts education to apply or integrate into their studio work.

7. Incomplete education of instructors. This aspect refers to the instructor and visiting reviewers’ teaching and learning techniques. Professors in higher education in many disciplines, particularly in professional programs, are not taught to be teachers—the type of education received by architects is knowledge-based but practical, and highly open-ended in nature. Architects are taught to be architects and not teachers, and they are not formally exposed to educational theory. Therefore, they tend to imitate their professors’ teaching and critiquing methods (Anthony, 1991), or those of colleagues and other mentors, for better or for worse.

8. A lack of student-centered assessment in studio learning. Design studio education is open-ended, and students tend to interpret their worth through grades (Kohn, 1999).

9. Harsh critiques and juries. In design studios, students have the opportunity to present their projects to their instructors, peers, and members of the architectural arena through critiques and juries. Juries or critiques are very public forms of student evaluation and these activities are sometimes seen as places for harsh judgment (Anthony, 1991).

10. Lack of diversity. A diverse learning environment is a goal for many architectural schools, but diversity still is an issue that has not been fully addressed. Architecture has been a white, upper-class, male-dominated discipline for many years, and even today only a low number of women and people of color are in practices, governing organizations, and academia.
Most of the key aspects just discussed are essentially socially constructed through the social and environmental qualities of the through a major part any architectural education program. Since a major part any architectural education program is the design studio, these aspects have the potential to have a major impact by affecting the experiences that students have in the studio setting. Unlike the more traditional classroom, experiences in the design studio have not yet been studied extensively, let alone the learning and teaching in the design studio. These gaps in the literature make it difficult to describe studio experiences of students and instructors alike and create a problem for design educators striving to improve the learning and teaching that occurs in the design studio (Schön, 1985). Additionally, the gaps in research create problems for students trying to understand the dynamics of the design studio, since most of their classroom experiences have been in traditional settings, such as lectures and seminar-type classrooms. Moreover, the lack of literature also creates a problem when design educators interact with other higher education instructors and attempt to explain design studio interaction at all levels and especially in terms of learning and teaching. While the document from the AIAS task force is a good start, with its anecdotal documentation of some key aspects previously mentioned, both negative and positive, very few, if any, strategies have been recommended to improve the design studio situation.

Regardless of the lack of research-based guidance for creating positive experiences, design studio education still needs to occur, and most faculty still consider the design studio format the best or the primary way of educating designers (Corona-Martinez, 2003). Therefore, the education of designers involves students placing themselves at risk for the negative aspects of learning design, but the education also sets them up to benefit from the positive aspects of the culture. But without formal research to better understand the design
studio experience, we cannot capitalize on the positive aspects nor begin to address the negative aspects.

In 2003, a qualitative inquiry by Lueth described some of the various teaching styles in the architectural design studio. Some of the data collected in the study suggested that the students who are part of the design studio culture, in general, did not have a voice concerning how the studio operates administratively but can help shape the culture due to their interaction with each other, the instructor, and the project (or assignment in the syllabus). The administrative and faculty control is dominant because not only is the design studio environment (in general) a long-standing tradition in design circles, but the design students are also viewed by many instructors as blank slates. Even though students ran the design studio in the early 1700s (Kostoff, 1977), the design studio has become a place where instructors lead and students follow in terms of ideas generated for an assignment. On the other hand, as was indicated in Lueth’s study, there are other instructors who chose to allow the students to generate ideas and implement them with very little instructor guidance.

Therefore, design students—whether they are new to the design studio learning environment, or those who have experienced the design studio but are not quite sure how the design studio operates (Anthony, 1991)—find it very difficult to form perceptions of what occurs in the design studio when (a) instructors’ personalities vary, (b) instructors’ expectations are unclear (Anthony, 1991; Dutton, 1984, 1991), and (c) students’ backgrounds have not prepared them for such an environment. In the face of those difficulties, one of the only ways for students to perceive the design studio is to rely on the syllabus and the professor for an interpretation and, in the case of architectural students, to rely on
upperclassmen because they have an understanding of the culture of the architectural design studio.

In this inquiry, architecture design students’ perceptions about their learning experiences in their design studios were identified and their learning experiences were described. This was accomplished using in-depth interviews of a group of students involved in a selected design studio and a focus group with the same participants. Data collection and analysis was accomplished through a lens of the social constructivist and constructionist learning theory, with reference to Chickering and Reisser’s (1993) student development theory.

**Rationale**

The design studio in general has been minimally studied, thus creating a lack of systematic documentation—and perhaps giving rise to misunderstandings—for design educators and design students. The experiences of both the student and instructor in the design studio are, therefore, not extensively documented and/or are potentially misunderstood. In every classroom, whether a lecture, lab, or seminar, people play a role in how learning occurs. The main actors in these settings are the professor/instructor and the student (Anthony, 1991). Even though the professor/instructor plays a big role in a student’s learning experience, this study illuminates student experiences in the design studio rather than emphasizing the professors’ experience because when using phenomenological research methods, as a researcher, one is attempting to understand the lived experiences of the participants and “develop patterns and relationships of the meaning” (Creswell, 2003, p. 13) that they made. I did not want the instructors’ perceptions to influence the way that I
interpreted the students’ perceptions, even though the instructors might have influenced these perceptions.

Since research on design studio education is especially limited, this study adds to the knowledge base about architecture students in architectural education. The student experience in any college student’s life creates an important marker in their perceptions, but compared to the conventional classroom, the design studio is a different learning, teaching, eating, playing, and sleeping environment. Specifically, the design studio carries this unique quality of continual and varying interaction. An earlier study suggested that students were initially not used to this type of environment, compared to the learning environments to which they had been previously exposed (Lueth, 2003).

Through interaction in the design studio learning environment, students made meaning of their experiences, as findings from Lueth (2003) have also shown. Varying interaction in the design studio created a classroom culture that was extremely different than conventional classrooms in which participants had more experience. This study, therefore, will help in the development of future studies that emphasize the importance of interaction in the architectural design studio environment and its potential for positively influencing teaching and learning in higher education. The results of this study are important because there is value in understanding students and the student experience in the classroom (as Victoroff & Hogan, 2006, suggested in their study of students’ perceptions of effective learning experiences in dental school).

**Problem Statement**

Most of the participants of the architectural design studio (students and instructors) have a broad understanding of the culture of the architectural design studio. Therefore, the
perceptions and descriptions that are influenced by the interaction that occurs among these participants, the assignments, and the environment have been taken for granted rather than studied. Study is warranted because participants’ perceptions have had a strong impact on the discussion surrounding the architectural design studio, and knowledge of students’ learning experiences in that setting is important since these experiences contribute to architectural student learning. Without understanding their experiences, it may be difficult to facilitate positive change in the architectural design studio environment.

**Purpose of the Study and Research Questions**

In light of the above discussion, this study is a qualitative exploration of fifth-year architecture students’ learning experiences in their architectural design studios from their first year to fourth year. The goal of this exploration was to understand design student learning experiences in the design studios in the architecture department of the College of Design at Iowa State University. This study describes the students’ learning experiences and the perceptions that they have of these experiences in design studios and within the “studio culture” that exists in this place, particularly in terms of the interactions that take place within the studio environment both during the officially designated class time and beyond.

Keeping this purpose in mind, the following research questions guided this study:

1. How do particular architecture students currently taking a fifth-year design studio describe their learning experiences in their first- through fourth-year design studios at Iowa State University?

2. How do particular architecture students currently taking a fifth-year design studio perceive and give meaning to their learning experiences in first- through fourth-year design studios at Iowa State University?
3. What are the experiential outcomes of the learning experiences of these particular fifth-year architecture students that are exhibited in their fifth year?

**Theoretical Framework**

Constructivism, social constructivism, and constructionism play an important role in helping define what learning might embody in the design studio. Additionally, for the purpose of this study, Chickering and Reisser’s (1993) theory of student development was also key in understanding the transitions that students made from year to year in their design studios.

**Constructivism, Social Constructivism, and Constructionism**

In constructivism, the participants in an environment are viewed as individual constructors of knowledge and are active in creating their own reality (Piaget, 1954). Constructivism opposes the idea of students being blank slates and the teacher as the sole knowledge provider, suggesting, rather, that teachers should be aware of the students’ learning process and facilitate their learning (Papert, 1980). Social constructivism is an expansion of constructivism based on three things: (a) individuals and societies constructing their understood reality through human interaction (Kukla, 2000); (b) knowledge being socially and culturally constructed, through this interaction (Gredler, 1997); and (c) learning occurring internally and externally through a student’s engagement in social activities (McMahon, 1997). The expansion of constructivism in social constructivism is that not only do students participate in the construction of their reality (which constructivism warrants), they also do so in a social setting with other participants in their setting.

While constructivism emphasizes the subject as the builder of reality, constructionism focuses on the constructs of the builder (the subject) as being external and shared. This
requires the production (“externalization”) of an artifact to share with members of a culture, society, group, classroom, etc., so that feedback can be given, allowing a rethinking of what was made (“internalization”) and a remaking of a new idea (“externalization”) due to the sharing that occurred (Papert, 1990, p. 3). The process becomes crucial to the development of an individual. Papert, when explaining the process of internalization and externalization, said the following:

We understand “constructionism” as including, but going beyond, what Piaget would call “constructivism.” The word with the v expresses the theory that knowledge is built by the learner, not supplied by the teacher. The word with the n expresses the further idea that this happens especially felicitously when the learner is engaged in the construction of something external or at least shareable ... a sand castle, a machine, a computer program, a book. This leads us to a model using a cycle of internalization of what is outside, then externalization of what is inside and so on. (p. 3)

In this study, the preliminary data collected showed that the architecture design studio is experienced by a student as a compilation of interactions among the instructor, the other students, and the environment. The students’ learning experiences become the experiences that they have while engaging in activities such as reviews/juries/critiques, group projects, pin-ups, one-on-ones, and any other interactions that occur in this setting, whether they are academic or nonacademic. In the constructivist viewpoint, these architecture students would be seen as the active constructors of knowledge and not just passive absorbers of knowledge, while in the social constructivist viewpoint they would be seen not only as the active constructors of knowledge but as specifically constructing that knowledge within a specific
social setting that includes both the physical context and the social interactions within it.

Finally, in the social constructionist viewpoint, architecture students would be seen as active constructors of knowledge, who can share this knowledge by externalizing (i.e., by producing work and showing it and/or talking about it) and internalizing (i.e., by taking feedback and rethinking their knowledge) and then externalizing again. Therefore, constructionism builds on the constructivist theory (Papert, 1990). Both active knowledge construction and the interaction with the environment occur in design studios, making social constructivism the view that this study takes. Additionally, the literal production (construction) of artifacts for this study is also relevant in terms of constructionism.

Some factors that affect student learning experiences in the design studio include race/ethnicity, gender, and socioeconomic status (Cuff, 1991). Additionally contextual factors such as environmental influences affect student learning experiences (Eklund-Myrskog, 1997). Though all of these factors are very important to how students might experience the architectural design studio, as suggested by Anthony (2001), Crysler (1995), Cuff (1991), and Dutton (1991), this inquiry focuses on the contextual factors. Due to the implication that learning experiences are multidimensional and, therefore, can have multiple meanings and are abstract, a constructionist qualitative approach and a phenomenological methodology are appropriate for this study.

Phenomenology is interested in how people make meaning of their experiences (Crotty, 1998), and the constructionist paradigm is concerned with the lived experiences of individuals. This study is, therefore, phenomenological because it seeks to understand the learning experiences of architecture students in their design studios and the meaning that they attach to these experiences, with learning experiences being the phenomenon.
Chickering’s Theory of Student Development

Chickering and Reisser’s theory is a psychosocial theory concerned with the development of identity in college students, which is a revision of Chickering’s vectors originally introduced by Chickering in 1969. In their revision of Chickering’s original theory, development was described by Chickering and Reisser (1993) as “qualitative changes in thinking, feeling, behaving, valuing, and relating to others and oneself” (p. 2). While Chickering’s original theory (1969) addressed the developmental stages of traditionally aged college students in the 1960s, the theory was redefined, based on later research concerning student development (Reisser, 1995). Chickering and Reisser’s most recent vectors include the following:

1. Developing competence: This vector covers three areas of competence (Reisser, 1995): a) intellectual competence, which is the acquisition of knowledge and skills related to subject matter; b) physical and manual competence; and c) interpersonal competence, which includes growth in relationships.

2. Managing emotions: This vector implies an increasing awareness of one’s feelings and also an integration of feelings, including being able to act appropriately based on one’s feelings. In this vector, Chickering and Riesser (1993) expanded on Chickering’s (1969) idea of managing emotions, which was originally only geared toward the emotions of aggression and sexual desire, to include a wide range of emotions.

3. Moving through autonomy toward interdependence: The importance of interdependence between individuals is supported by this vector (Chickering & Reisser, 1993). Previously, this vector was called “developing autonomy,” and it did
not focus much on interdependence. Now, this vector relates more to the relationships that people have with one another and their attachment to one another.

4. Developing mature interpersonal relationships: Reisser (1995) acknowledged that accepting individual differences and cultural diversity can lead to better relationships. Trusting, communicating openly, and being positive toward others are developmental tasks associated with this vector. Previously (Chickering, 1969), this vector was called “freeing interpersonal relationships” and came right after the vector “establishing identity,” while now precedes it.

5. Establishing identity: In this vector, students define who they are. Establishing identity includes being confident in one’s self, accepting one’s self and knowing one’s self, physically, emotionally, and intellectually. Reisser (1995) proposed, “Any experience that helps students define ‘who I am’, ‘who I am not’ can help solidify a sense of self... Personal stability and integration are the result” (p. 509).

6. Developing purpose: This vector focuses on lifestyle choices, life planning, priority establishment, and developing a purposeful life. It also involves the goals set by students for their vocation and education. Making wise decisions becomes an important factor under this vector.

7. Developing integrity: The congruency of the relationship between what one believes and how one acts is defined as integrity. This includes humanistic and personal beliefs. Three stages are related to this vector. The first is humanizing values, where a rigid way of thinking is counterbalanced with the acceptance of others’ ways of thinking. Second is personalizing values, which includes confidence in one’s values, while, at the same time, others’ beliefs are recognized. Reisser (1995) explained this
stage as an individual, “affirming one’s own values and beliefs, while respecting others’ view points” (p. 510). The third stage is developing congruence, where “social responsibility” and “self-interest” are “balanced” (Evans, Forney, & Guido-DiBrito, 1998, p. 40).

Addressing the third guiding question for this study, Chickering’s theory especially framed the way the outcomes were interpreted. This study is the first in design education, specifically studio education, to use Chickering’s widely accepted theory to understand how students perceive, understand, and describe their design studios.

**Significance and Implications**

This inquiry contributes to literature on the design studio in general and more specifically contributes to the literature on the architecture design studio. Since this study focuses on the design students’ learning experiences, exploring their perceptions, descriptions, and experiential outcomes of their learning experiences in their design studios, one possible implication for students is that they might become more aware of the role the studio environment plays in their learning. Another implication of this study is that instructors might begin to see students in a different light (not according to the instructors’ perceptions), improving the academic relationship that they have with the students. This is in line with what Richlin (2006) suggested: taking steps toward knowing students improves on the academic relationship between the two parties and leads to more effective learning. Interaction between students might also be more fully understood, leading to a better understanding and accepting of differences between students. In addition, administrators might also be impacted by the illumination of student needs, which would be useful when developing curriculum with faculty members.
This study also contributes to the literature of social interaction and learning in learning environments that are alternative to the traditional classroom setting (lectures, seminars, laboratories, etc.). Current literature in education does not have descriptions of a learning environment that describes the design studio and, particularly, the architectural design studio. This study adds to the list of learning environments that have been examined and contributes to a greater understanding of the interaction that occurs in the design studio, allowing different strategies of teaching and learning to be applied to other settings.

**Limitations of the Study**

One possible limitation is that as both a student and instructor in this research environment, I was known to the participants at least by reputation, as an instructor. This limitation could have led to bias in the research; therefore, I used a reflexive methodology (writing in a journal) throughout the process of the research. Unlike some postmodernist perspectives on qualitative research that require the “death of the author” (Rosenau, 1992, p. 31), I take the position that my reflexivity aided in my understanding of how design students verbalized and made meaning of their experiences.

Regardless of this limitation, the implications of this inquiry were useful and have opened doors for further studies to be done in architecture and design education. My hope is that this study can also be a stepping-stone for further studies to examine higher education relating learning environments.

**Relevant Definitions and Descriptions**

The inquiry is geared towards educators in higher education, especially in design, architecture, and education. Therefore, in this section the terminology used in this study will be explained to expedite understanding.
Architecture Terminology

The dimensions of the design studio

Design studio refers to a class type and specific physical environment. A studio is a setting used by educators and learners in design to execute design assignments or projects. Design studio is mainly a physical space, but it can also be pedagogical and virtual. That is, the design studio is designated for a group of students and instructors to learn and teach. The design studio can also be referred to as the studio or learning lab. At Iowa State University and other universities, the pedagogical design studio carries with it a certain philosophy of learning, depending on how the curriculum is structured. Examples of what this philosophical or pedagogical learning environment can be called are a first-year design studio, a second-year learning lab, an architectural design studio, a landscape architecture studio, or even a core design studio. In this study, I refer to the designated learning and teaching physical space as the design studio or the studio. I also refer to the pedagogical space as the core, second-year, architectural (and so on) design studio based on how it is structured in the curriculum.

Unlike most classroom environments, which at any given moment are either empty or combine students and faculty who are learning and teaching together at a specific time, many studio environments continue as a learning and teaching environment beyond the designated “class time” when the instructor is not present. In fact, many architecture programs encourage students to continue to work in these spaces outside of the designated course hours without faculty members present; independent studio work is central to their stated pedagogy. Their rationale is primarily twofold: a) to support students learning from each other while supporting each others continued learning, and b) to reinforce the integrative
nature or intent of design studio content. To explain the second aspect of the rationale, the idea is that if, as a student, you are doing the homework from all your other non-studio courses in your studio workspace this will reinforce the importance, value, and necessity of their content to your design studio projects and encourage you to bring that content and knowledge into each studio project. The architecture program at Iowa State University is such a program. This understanding and definition of the studio’s role and its culture is referred to as “studio culture.”

Therefore, both the physical and pedagogical design studio environments can be compared to a fraternity or sorority, where students have prolonged unmonitored contact with each other, seeking friendships in their setting. It can also be compared to an elementary school classroom where the faculty members are role models (Anthony, 1991). This dichotomy of being friends with their peers and at the same time seeking approval of the instructor in charge creates an environment where there is both friendship and collaboration with their peers, and competition between students to gain recognition and approval from critics (Dutton, 1984; Ward, 1989). At the same time, student-to-student learning and interaction also takes place, with and without the presence of the instructor (Lueth, 2003).

Although, in recent years, some schools and programs have introduced virtual studios—design studios that are taught over the Internet—and a context where students learn and are critiqued over the Internet through the sharing of information, this exploration did not delve into that realm.
Studio education at Iowa State University (ISU), the College of Design, and the architecture department

The architecture department at ISU is one of four departments in the College of Design, a relatively young college on campus. The College of Design was created 30 years ago bringing architecture out of the engineering college, landscape architecture out of the agriculture college, and applied arts (now called art and design, which includes interior design and graphic design as well as fine arts) out of the home economics college, and adding community and regional planning. In addition to the relationship of these disciplines in terms of the creation and enrichment of the constructed environment, they are all also largely studio based. One of the original concepts for this restructuring was to enable greater interaction or interdisciplinary work between these various design departments, and how interactive or interdisciplinary the various departments actually are has varied over time. Recently, in an effort to increase this interaction, improve education, and increase cost effectiveness, the College of Design decided to create a common first-year curriculum. The architecture and landscape architecture departments offer accredited five-year professional undergraduate programs, while all other undergraduate programs in the college are the more typical five-year bachelor’s programs.

First-year architecture/the core foundations program. In the last three years, the College of Design has revised the first-year curriculum, or Foundations Program, to help improve first-year education (Academic Affairs Council, 2003). The Foundations Program was initiated to create an equal opportunity for students desiring to enter into and matriculate from one of the design majors at Iowa State University, especially those that are management
enrolled\(^1\) (Design Studio Task Force, 2002). Also see Appendix B for 2007 management-enrolled criteria.

Administratively, the heart of the Foundations Program lies within the common design studio/core design studio/Learning Lab, which acts as the bridge between design disciplines (architecture, community and regional planning, art and design, and landscape architecture), theoretically giving students common knowledge, background, and skills to allow for multiple applications into a range of design programs by the end of their first academic year. Therefore, this program gives students the option to select from the range of professional degree programs that the College of Design offers by providing them with an interdisciplinary education (Schwennsen, 2002). Prior to the new program implementation in the 2004-2005 academic year, first-year design studios were restricted by major, therefore restricting the application process, depending on what students had declared as their major area of study when they first enrolled at Iowa State University. The Foundations Program presently serves approximately 650 first-year students in design.

**The second-, third-, and fourth-year of architecture study.** Students apply to the architecture program through a portfolio application process. In addition, to be accepted to the professional program, students are encouraged to take one semester of trigonometry, one semester of analytic geometry, one year of physics, and one year of studio art classes. The application process also includes a review of high school or transfer records, the student’s performance in the core curriculum courses, and an essay.

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\(^1\) Have a set of specific criteria used to determine the eligibility for students applying into desired programs after their first-year in the core design program.
Typically, approximately 64 students are accepted into the program each year as four studios, meaning each studio will have about 16 students in it. Each year level also has a coordinator whose responsibilities include reviewing and/or writing the syllabi, administrative duties such as the organization of studio activities, and also teaching a studio in the year level that they coordinate. Every semester from second year to fourth-year first semester, students move to a different studio space with a different professor. A rather unique feature of Iowa State University’s architecture program is that each semester from the second year through fourth-year first semester, there is a short field trip either within or outside of the United States primarily related to that studio’s projects for the semester. In the second semester of the fourth year of study, each student has the option of going to Rome, Italy for a semester of study abroad. Students may opt not to go on this study abroad option; in which case, they will choose from several studio options that have the potential of being interdisciplinary and vertical. Vertical studios have students at different year levels (therefore bringing potentially different skills, knowledge, and levels of development to the studio). At the ISU architecture department, these vertical studios are only offered at this upper level and at most contain fourth- and fifth-year undergraduate students, and third-year graduate students. Undergraduate students who go to Rome will only have the vertical studio option in their fifth year.

**Fifth-year architecture studios.** In the fall semester of the fifth-year, students can choose to do an independent project, working with a professor or critic of their choice. They are provided a studio space in which to work. Students also have the option to choose from studios somewhat similar to what they have been accustomed to in the previous years, in that the projects are driven by the professor, but they may vary to the extent that they are more
real-world based, have a design-build base, or other unique quality. In the spring semester, students have the option of joining one of the potentially interdisciplinary and vertical studios described above or of doing an independent project working with a professor or critic of their choice

Projects or assignments

Studios engage students with architectural learning using various projects which are assigned to students. Depending on the studio, students can work on several distinct projects during the semester, several projects that build toward a final compilation or solution, or on one project (much like an independent study). Students can work (a) totally independently, (b) partially in groups or teams and partially independently, or (c) totally in groups or teams. Projects are sometimes real world based; that is, they are complex and multi-faceted. Indeed, part of what students are learning is how to integrate various information and skills into applied work once they have graduated.

In many design schools, including Iowa State University, that wish to foster a studio culture as previously discussed, the work to complete these projects is expected to be done primarily in the design studio, especially at the second- through fifth-year levels. While some students may do some work at home or in other venues beyond the studio class time, students are expected to be working in the studio space during the official “class” time, whether or not they are working with each other or the faculty member. Unlike traditional classroom assignments, the design studio project relies not only on the final “product” of a student’s work but also on the visible process that a student takes to get to the final product.
Juries/critiques/reviews/pin-ups

Unlike other classrooms where student work and knowledge is reviewed through assignments, tests, quizzes, papers and the like, student work in the design studio is constantly being reviewed through the use of *desk crits*, where instructors spend the class period speaking to students individually at their desks about their work. Student work is also reviewed through public juries/critiques/reviews. The difference between a review and the desk crit is that the review is a session where a group of students is faced by a panel of “judges” (Anthony, 1991). These reviewers are mainly instructors—although sometimes students can act as reviewers—who give students feedback on the work produced for a project. Reviews usually occur midway through a project and again at the end of a project. On the other hand, a pin-up (a “mini” review) allows for quick feedback and discussion, so that time is not wasted, allowing students sufficient work time in studio. A pin-up, unlike a review, can occur at anytime. For the purpose of this study, I will be using the term *review* to describe a formal way of assessing student work.

The culture of architectural education and design studio culture

The *culture of architectural education* is the way that the education of an architect is conducted. This is comprised of several factors, including the administration of the architecture department concerned, the individual program’s mission, curriculum and approach, and the teaching and learning in all classes including design studio. Architectural design studio culture is embedded in the teaching of design studios and is strongly impacted by the culture that develops in those “studios” when students are working in them beyond the assigned class hours without faculty members physically present.
Education Terminology

This section introduces the terminology mainly used in education circles to describe learning, the principles of learning, and the research methods used in this study. The terms are listed in alphabetical order.

**Constructionism**

A theory of learning that recognizes the knowledge that students construct as external (i.e., through artifacts) and shareable, which, in turn, is rethought due to the feedback attained from participants in the environment.

**Constructivism**

A theory of learning that opposes the idea of learners as a blank slate and recognizes learners as active constructors of knowledge.

**Learning**

For the purposes of this study, learning is the knowledge actively created by participants in an environment, which is shared (externalized) and rethought (internalized) by individuals through the production of work (artifacts) and the reception and consideration of critique from participants in the environment.

**Learner-centered**

Being focused on the learners’ learning.

**Learning environment**

The environment in which learning occurs. For this study, the environments were the design studios from the first year to fourth year of study.
Learning experiences

The experiences that students have due to their learning in a particular environment. Environments could be classrooms, on-campus settings, or off-campus spaces in which students engage.

Phenomenology

The study of phenomena. In this case, the phenomenon is the participants’ learning experiences.

Social constructivism

A theory of learning that opposes the idea of learners as a blank slate and recognizes learners (individuals) as active constructors of knowledge due to interaction among individuals in a particular context.

Social constructionism

A theory of learning that expands on constructivism. It emphasizes the constructions that the subject makes, which are “external and at least shareable” (Papert, 1990, p. 3). These constructions are then reconstructed through a process of internalizing and externalizing.

Summary and Review of Dissertation

In this chapter, I introduced the design studio and the different aspects that could exist in a design studio setting, whether positive or negative. I then gave my rationale for doing this study, which was because the architecture design studio has not been at the forefront of discussion in design circles or in education. I also presented the problem, that of the design studio being minimally understood by the participants of the design studio, creating a lack of understanding of the design studio interactions. Next, I discussed the purpose of the study and the research questions. The purpose of this study was to understand architecture design
students’ perceptions of their learning experiences in their design studio. I also discussed the significance of the research as well as the potential implications. Finally, the limitations of the study were acknowledged and relevant words and phrases were defined and explained.

In chapter 2, I review the relevant literature from both the higher education and design disciplines. Following that, in chapter 3, I provide an overview of how the study was organized from the data collection phase through analysis and introduce the participants/narrators/actors. Chapter 4 presents the results in a narrative form, as well as a brief listing of themes. Finally, in chapter 5, I discuss the themes in relation to the literature. I also discuss the implications of the findings, give suggestions for further research, and share what I learned while conducting this study.
CHAPTER 2

LITERATURE REVIEW

This literature review focuses on four relevant areas: learning, student development theory, the learning environment, and the design studio as a learning environment. The first area is learning and how learning occurs, emphasizing how students learn and learner-centered psychological principles within the higher education classroom environment (Atkinson, Atkinson, Smith, Bem & Nolen-Hoeksema, 1996; Burr, 1995; Marton & Tsui, 2004; Sarason, 2004; Schön, 1987; Wilson, 2002). Within this area, I discuss constructivist learning theory (constructivism) (Dewey, 1938; Fosnot, 1996; Howe & Berv, 2000; von Glasersfeld, 1996, 2000) and its relationship to other theories that have evolved from it, including social constructivism and constructionism. In addition, I discuss constructionism in relation to constructivism, highlighting their differences and similarities, and conclude that both social constructivism and constructionism are relevant viewpoints on which to base this study. Also in conjunction with constructivism, I discuss Vygotsky’s social development theory (SDT) (Thomas, 1990; Vygotsky, 1978; Wertsch, 1985; Wertsch & Sohmer, 1995) and Bandura’s social learning theory (SLT) (Bandura, 1977, 1978, 1986, 1989; Crosbie-Brunett & Lewis, 1993; Jones, 1989; Miller & Dollard, 1941; Thomas, 1990; Tolman, 1932; Woodward, 1982), addressing the premises of the theories and how they relate to architecture education through the design studio.

The second relevant area is student development theory. The theory that is pertinent to this study and acts as a lens through which this study can be viewed is Chickering and Reisser’s vectors or dimensions of development (Chickering, 1969; Chickering & Reisser, 1993; Evans, Forney, & Guido-DiBrito, 1998; Reisser, 1995, Thomas & Chickering, 1984).
Chickering and Reisser suggested that students must address seven different aspects of development while in college, each of which is influenced by the collegiate setting. But, before discussing Chickering and Reisser’s vectors, it is necessary to introduce learning theories such as behaviorism (Crosbie-Brunett & Lewis, 1993; Philips & Soltis, 1998; Posner, 1995; Skinner, 1953) and maturationism (Erikson, 1950; Fosnot, 1993; Gesell, 1940; von Glasersfeld, 1996; O’Loughlin, 1992; Streffe & Gale, 1995) that contrast with Chickering and Reissers’s idea of development and epitomize stage and task learning. This discussion aids in delineating the focus of this study, which is not to highlight the development of students in rigid, hierarchical stages, but rather to consider the overlapping sequences of development they experience.

The third relevant area I examine is the learning environment, drawing on literature that defines what a learning environment is and three different types of learning environments that constructivist educators aspire to create both in the K-12 system and higher education (Duschestel, 1993, 1994; Hannafin, 1992). Three relevant learning environments are constructivist (Jonassen, 1994; Reeves, 1992; Wilson, 1996; Jonassen, Davidson, Collins, Campbell, & Haag, 1995), problem-based (Boud, 1985; Banerjee, 1994; Coles, 1990; Cruickshank & Olander, 2002; Lacey & Merseth, 1993; Margetson, 1994; Meirson, 1998; Ochoa & Robinson, 2005; Ostwald & Chen, 1994; Patel, Groen, & Norman, 1991; Shannon & Brine, 1994), and learner-centered (Alexander & Murphy, 1998; Astin, 1993; Grimmer & MacKinnon, 1992; Huba & Freed, 2000; McCombs, 1997; McCombs & Whisler, 1997; Reilly, 2000; Shulman, 1987). Although these learning environments can be described by both the physical and social behavior of the environment, this study focuses on the social learning environment.
The fourth area I discuss is the architectural design studio in general, drawing on the limited studies that have been done on the design studio and focusing specifically on the characteristics that make the design studio different from the traditional classroom (Agryis, 1981; Anthony, 1991; Austerlitz, Aravot, & Ben-Ze’ev, 2002; Cuff, 1991; Koch, Schwennsen, Dutton, & Smith, 2002; Salama, 1995, 1998, 2002; Sanoff, 2003; Schön, 1981, 1983, 1985, 1988; Seidel, 1994; Stamp, 1994). I examine the evolution of the architecture design studio—a discussion relevant to understanding how the design studio functions, what the architecture design studio pedagogy is, and what interaction in the design studio normally entails. I conclude with a description of how this interaction brings to the forefront the different components of the studio, emphasizing the interaction in the design studio as a lens through which the design studio can be viewed.

**Learning**

According to researchers and educational philosophers, there are several ways of learning. Scholarly views of learning have changed significantly in the last 20 years, from the idea that students are blank slates to the idea that students are active constructors of knowledge. Barr and Tag (1995) acknowledged this stating, “Knowledge is not seen as cumulative and linear, like a wall of bricks, but as a nesting and interacting of frameworks. Learning is revealed when those frameworks are used to understand and act” (p. 21). Other proponents of this idea are grounded in constructivist learning theory.

Sarason (2004) described learning as “a process that occurs in interpersonal and group contexts and is always composed of an interaction of factors to which we append labels such as motivation, cognition, emotion or affect, and attitude” (p. vii). Learning was also defined by Marton and Tsui (2004) as “the process of becoming capable of doing
something as a result of having had certain experiences (of doing something or of something
happening)” (p. 5). They also stated, in their definition of the learning process, that “learning
is always the acquired knowledge of something” and emphasized that “acting or actions” (p. 4)
need to occur so that learning can also occur. The textbook definition of learning, as
Atkinson, Atkinson, Smith, Bem, and Nolen-Hoeksema (1996) described, is “a relatively
permanent change in behavior as a result of practice or experience” (p. 227). On the other
hand, Wilson (2002), who conducted a ten-year study of student learning in design education
in Australia, described learning differently:

> Learning anything new challenges the students to suspend existing beliefs, address
> personal prejudices, and keep an open mind. This demand can promote a sense of
> excitement and potential discovery or can result in the reluctance to start the process
> [of learning]. (p. 407)

Additionally, Schön (1987), in his study of the *reflective practitioner*, specifically
talked about the learning in design. He acknowledged that students were expected to know
how to design without being taught and were not told how to go about doing design; so
instead, they must discover for themselves this process of design. Schön suggested that this
way of learning resulted in students becoming frustrated in their early years in design school.

Finally, Zull (2002), who talked about the brain and how learning occurs and also
elaborated on the implications that brain research and the knowledge of the function of the
brain has on teaching, stated the following:

> The human brain is a learning organ; learning is what it does. The main task of the
> teacher is to help the learner find connections. Once a student encounters things that
connect with her [or his] life, her emotions, her experiences, or her understandings, she will learn. She won’t be able to help herself. Her brain will change. (p. 242)

Zull’s definition of learning is, therefore, a change in the brain.

With these definitions in mind, in the next section I give an example of a learning theory that has been used to interpret design studio learning. I then discuss specific learning theories and how they might relate to the learning that occurs in the design studio. In addition, I review constructivism, social constructivism, and constructionism, including radical constructivism. I also describe the relationship of these theories to behaviorism, including Bandura’s social learning theory and Vygotsky’s social development theory. I also briefly mention maturationism. I conclude by discussing various learning theories and building a case for the applicability of social constructivism and constructionism for the purposes of this study.

**A Common Learning Theory Used in Architectural Education**

In architectural education, Kolb’s (1984) learning style inventory and the concept of experiential learning is the theory most commonly used by scholars to study learning in the classroom. Kolb (1984) suggested that people develop learning preferences, and he developed a model that outlined the various learning preferences of students. Kolb theorized that the learning process is a cycle involving four dimensions that the individual must go through for learning to occur, although the learner involved does not have to start from any specific dimension. Two of these four dimensions, according to Kolb, indicate how learners grasp information. These two dimensions are *concrete experience* and *abstract conceptualization*. The remaining two, *active experimentation* and *reflective observation*,
indicate how learners transform experience into learning. The four dimensions combine into four learning styles, which are:

1. **Convergers**: Individuals whose preference is conceptualization and active experimentation. Convergers are described as inductive reasoners who are skilled at decision-making and are very practical. They prefer to focus on tasks rather than social and emotional concerns.

2. **Accommodators**: Individuals whose preference is concrete experience and active experimentation. Accommodators solve problems through intuiting and trial and error; they are open to change and therefore can adapt easily to situations.

3. **Divergers**: Individuals whose preference is concrete experience and reflective observation. These learners have been described as imaginative, very ethically inclined, sensitive to others and therefore interested in people; they are good listeners and open-minded. They also thrive in environments where ideas are being generated.

4. **Assimilators**: Individuals whose preference is abstract conceptualization and reflective observation. Unlike divergers, assimilators are less inclined to be concerned with people, have excellent analytical skills, reason inductively, organize information well, and have an interest in designing experiments and testing theories.

The reason why several scholars use this theory to study design studio education in architecture is because the basis of this theory is *experiential learning*. Experiential learning is learning through experience, both formal and informal (Itin, 1999).

Although this learning theory is the one most commonly used in architectural education to study learning in the design studio setting, this study did not use it because the questions that guided this study focused on the perceptions and descriptions of participants’
learning experiences, considering areas such as interrelations and transitions, which the idea of experiential learning is less focused on. Nevertheless, the literature review recognizes that some studies, though limited, have been done in the architectural design studio setting. So rather than focusing on learning styles and stages of information grasping and processing, this study uses theories like constructivism and social constructionism, giving insight into the dynamics of both individual and group interactions.

**Constructivism and Other Learning Theories**

Several researchers and philosophers have debated the science of learning, and unfortunately, learning theories are theoretical. Learning theories are most useful in a specific context of learning, and based on the context of the architecture design studio, where students learn through doing and one-to-one interaction with others in the same context, social constructivism and constructionism are the most useful learning theories in this situation. Within the constructivist epistemology, debate has taken place about learning and how one comes to know, giving rise to various types of constructivism, such as radical constructivism and social constructivism. The debates have caused divergences from and additions to the original theory, coined by the founding scholar Seymour Papert (von Glasersfeld, 2000) and another major contributor to constructionism, Kenneth Gergens. In this section, I discuss what constructivism, radical constructivism, and social constructivism are. I also address social constructionism and illuminate its differences, as compared to constructivism.

**Constructivism (constructivist learning theory)**

“Constructivism is a theory about knowledge and learning; it describes both what ‘knowing’ is and how one ‘comes to know’” (Fosnot, 1996, p. ix). Similarly, von Glasersfeld (2000) described constructivism as “a theory of knowing that attempts to show that
knowledge can be only generated from experience” (p. 6). Constructivism proposes that human beings are co-creators of the realities to which they respond, meaning that there are no meaningful realities without the individuals’ reasoning being involved in the process of reality-creation. These definitions are crucial for this study because learning from experience and conscious meaning generation are important areas that this study took into consideration.

These definitions are also important because research on the brain and how it functions has shown that learning occurs when new neurons are created (Bransford, Brown, & Cocking, 2000). Sylvester (1995) described a process in which the neurons “interpret sensory information, compare it with related recalled information, and determine how best to respond to the environmental challenges we confront” (p. 106). Moreover, Caine and Caine, (1997) described this learning process as one of finding patterns: “In a way, therefore, the brain/mind is both scientist and artist, attempting to discern and understand patterns” (p. 105).

Neurons are pathways in the brain that allow for connections called synapses within the brain (Zull, 2002). Research has shown that learning only occurs when something inconsistent is detected in the brain. Old information can be triggered (memory), but if the mind is not familiar with what is being presented to it, then learning occurs and new synapses are produced (Caine & Caine, 1997; Sylvester, 1995; Zull, 2002). The definitions of constructivism also suggest that people are individual and unique, yet need outside influences to learn as well. Brain research concurs with the constructivist definition because the more people learn, the more unique they get. The pathways in their brains form because of individual reasoning (Caine & Caine, 1991). This functioning is, therefore, important to
know because educators can use strategies to encourage the brain to learn. Some of these strategies are also very similar to the strategies of learning in constructivism.

Although constructivism is not a teaching theory, constructivist teaching can occur. Followers of constructivist pedagogy do not believe that knowledge can be passed on through “transmission”; rather, constructivist teaching involves giving students the opportunity to raise questions and reflect on their thought processes for a “meaningful experience” (Fosnot, 1996, p. ix) in the classroom. Although attractive in nature, constructivism is not an easy theory to apply to a real instructional setting because of the preparation that instructors have to go through to understand students when they first come into a learning setting (Dewey, 1938).

Jean Piaget is credited for differentiating between constructivism and other learning theories, but constructivism also has its roots in Lev Vygotsky’s work (Vygotsky, 1978). Piaget stated that “knowledge arises from actions and the agent’s reflection on them” (as cited in Fosnot, 1996, p. 4), and the actions that he referred to occur in an environment and are “grounded in and directed at objects that constitute the organism’s experiential world, not things in themselves that have an independent existence” (p. 4). The organism (participant in the environment) would, therefore, have a preconceived notion of an object, but would build on or change this notion as interaction occurs. In constructivism, the environment could be an item that individuals interact with or have formed judgments about and/or the surroundings in which the item is located. In essence, constructivist learning theory considers what students bring to a learning situation with them, including their “attitudes and interests,” and it is because of the interaction of these pre-existing characteristics that students then experience the formulation of a reality (Howe & Berv, 2000, p. 30).
Another type of constructivism, of which Ernst von Glasersfeld is a proponent and said to be a founder, is radical constructivism (von Glasersfeld, 1996; Howe & Berv, 2000). Radical constructivism is not a stance that this study will take because of its main presumption that questions the idea of shared meanings (von Glasersfeld, 1996). Unlike Piaget and Vygotsky’s constructivism, von Glasersfeld’s version supports the idea that “individuals can only really know their own private constructions of reality” (Howe & Berv, p. 32) and that one does not need to interact with others to establish these constructions.

Piaget and Vygotsky, on the other hand, are supporters of individual meaning-making and learning through the interaction with different individuals—also known as social constructivism.

**Social constructivism.** Baxter Magolda (1992) and Vygotsky (1978) asserted that construction of knowledge occurs in a specific context with a common cultural language. Social constructivism, unlike radical constructivism, suggests that meanings can be and are shared by the participants of the environment. These shared meanings and agreements of meanings are what are referred to as reality (Kanuka & Anderson, 1999; Kuhn, 1962). An example of this agreement in language—or shared meanings—is seen in the various uses of architecturally specific terms, such as *space, value, and form* (Ledewitz, 1985). Social constructivism, therefore, requires a conversation between participants in a learning context where reasoning and questioning can take place. This interaction creates a dynamic relationship in the architecture design studio, as suggested by Lueth (2003).

**Vygotsky’s social development theory (SDT).** In the early 1900s, Vygotsky’s work was not known outside of Russia because his work and name were banned and removed from
scientific journals due to the Marxist society in Russia, but Vygotsky’s daughter began to translate and publish his work again after his death in 1934.

Once his work was published more broadly, Vygotsky’s studies evolved through the study and refining of scholars’ work that he respected, such as constructivist Piaget. But at its core, Vygotsky’s SDT is based on two distinct aspects. The first is that interaction is essential for the development of cognition (Crawford, 1996; Vygotsky, 1978). Vygotsky asserted that cognition is a product of interaction in the social context or culture in which a child is brought up (Thomas, 1993; Wertsch & Sohmer, 1995). The second aspect is that there is a difference between what a child can do with or without help. This difference is called the zone of proximal development (ZPD) and requires that there be a constant interaction with one’s environment (Vygotsky). Vygotsky defined ZPD as “actual development level as determined by independent problem solving and . . . potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p. 86). In both aspects of Vygotsky’s work, there is a process of cognitive development. Within this process, language or symbols are important factors (Wertsch, 1985).

Studies that have used Vygotsky’s (1978) SDT as a lens have mainly focused on the language portion of his research. Only recently have educators used Vygotsky’s findings, including in initiatives to improve the social learning environment, specifically in instructional technology classrooms, cooperative learning classrooms (Doolittle, 1997), and classrooms that use problem-based learning (PBL) techniques (Hartland, 2003).

Under the subheading “behaviorism,” I also discuss Bandura’s social learning theory (SLT), which has two things in common with Vygotsky’s SDT: (a) they both assert that interaction with one’s environment is essential for learning; and (b) they both deal with the

As discussed in the previous chapter, interaction is a major characteristic of the design studio (Lueth, 2003). In this study, SLT helped me understand the idea of the different dimensions of interaction and their importance, bringing to mind the participants in the design studio environment and how they might influence each other, positively or negatively. Social development theory creates a deeper understanding of how the perceptions might be formed in a cultural context (Vygotsky, 1978), so even before a participant responds to a stimulus, there is an in-depth understanding of how that individual is making meaning or making sense of his or her world. Vygotsky’s SDT has also been known to challenge the traditional classroom setting (lecture-style and desks facing the front), looking at unconventional ways to teach and learn. Since both SLT and SDT can help illuminate the environment and interactions in the design studio, it is appropriate to discuss these types of learning theories in the literature review. In terms of learning experiences, these theories are relevant because they indicate possible ways for perceptions to be understood through interaction with others in a particular environment. Interaction for example, with others, is the stimulus in this qualitative exploration.

**Constructionism.** Another type of learning theory that has evolved from constructivism is constructionism. Social constructivists cannot ignore that there have been debates about the two types of constructions: constructionism and constructivism. Though
some scholars interchange the two terms freely, there is a difference between the two in educational circles.

Constructionism, unlike constructivism, emphasizes that meaning is constructed not by individual people, individually, but that meaning is constructed socially out of human interaction, affecting history, culture, and tradition (Papert, 1991; Turner, 1998). Social constructionism is, consequently, believed to occur in an environment where a “learner can consciously be engaged in constructing a public entity” (Papert, 1991, p. 1). Scholars like Vivian Burr have insisted that social constructionism is therefore not constrained, but that depending on the participant in the environment, social groups can begin to change their practices (Burr, 1998; Hibberd, 2005). Consequently, culture is constantly transforming (Hacking, 1999), although each one of us is born into a culture and a way of doing things (Barkway, 2001). The relevance of constructionism in this study is not only attached to the cultural aspect of the theory, but, more importantly, its emphasis on external and shared constructions is relevant.

Burr (2003) discussed four tenants of social constructionism: (a) knowledge is taken for granted; (b) history and socialization are important to social constructionism; (c) knowledge can affect social action [knowledge can generate social action]; and (d) a “social process” is needed to construct knowledge through the constant engagement with others (p. 5). In general, social constructionists believe that cognition is brought about by interaction through language and that language is essential in the creation of reality (Gergen, 1994; Harré, 1993; Neimeyer, Neimeyer, Lyddon, & Tsio Hoshmand, 1994; Potter, 1996; Shotter, 1993). So, the main difference between constructivism and constructionism is best described by Shaw (1995): “Where constructivism casts the subject as an active builder and argues
against passive models of learning and development, constructionism places a critical emphasis on particular constructions of the subject which are external and shared” (p. 1).

**Behaviorism**

Other theories of learning, such as behaviorism, which basically see learning as a response to a stimuli and that students are acquiescent and in need of motivation (Skinner, 1953), are less suited to the design studio environment because the design studio’s intention opposes behaviorism’s idea of student passivity. Even though behaviorism is what most students in the United States have experienced before they enroll in college and often during their experiences in the college classroom (Wink & Putney, 2002), the learning process begins to change when students are involved with the architectural design studio. This does not mean that instructors within this design studio setting do not have a behaviorist mentality; in fact, Lueth (2003) observed that one of the teaching styles that the instructors had in the design studio was that of a master, who viewed students as blank slates, meaning that the instructor’s intentions might actually be different than what students actually experience.

Behaviorism, which assumes that learning could be seen as a change in behavior due to the activities occurring in a context (Philips & Soltis, 1998), rewards likeable behavior in students and is focused on what students should do (Posner, 1995), and, therefore, it was an efficient way of teaching when it was first introduced to the educational world. But, behaviorism attempts to understand human behavior through the response to stimuli (Crosbie-Bruntett & Lewis, 1993) and, focusing on a response model, neglects to include other aspects such as culture, history, and politics, all of which may affect students’ lives (Wink & Putney, 2002).
Bandura’s social learning theory (SLT). One form of behaviorism is social learning theory (SLT), which emphasizes the importance of observation and modeling behaviors, attitudes, and emotional reactions of those with whom people interact (Bandura, 1977). While Bandura’s work mainly dealt with behavioral responses to stimuli (but emphasized cognitive regulation of this behavior) (Bandura, 1997; Jones, 1989), Vygotsky (1978) explored this cognition and how it develops, taking Bandura’s work a step further with an in-depth examination of cognition.

The foundation for Albert Bandura’s SLT was laid in the late 1800s by William James, who stated that the interaction of people and their environment affected the self (Crosbie-Bruntett & Lewis, 1993). Alfred Alder also contributed to SLT concepts, noting that there are purposes and goals behind behavior and that the perceptions that individuals have about their environment affect their behavior (Crosbie-Bruntett & Lewis). Another major contributor to SLT was Tolman, who proposed the idea of cognitions (Tolman, 1932), which affect behavior. Moreover, the term “social learning theory” was officially coined by Miller and Dollard (1941) who incorporated the concepts of SLT, particularly learning principles (including reinforcement, punishment, extinction, and imitation of models), into their theory of learning through environmental reinforcements and responses of individual behavior to a stimulus or stimuli (Woodward, 1982).

Social learning theory is slightly different from traditional behaviorism in that proponents of the former argue that individual cognition stands between the response to a stimulus, which results in behavior, whereas the proponents of the latter argue that only the response and the stimulus represent human behavior (Crosbie-Bruntett & Lewis, 1993; Jones, 1989; Perry, Baranowski, & Parcel, 1990; Thomas, 1990; Woodward, 1982). Social learning
theorists (including Julian Rotter, Robert Sears, Walter Mischel, Ronald Akers, and Albert Bandura) share three premises in their research and philosophy: (a) the reward or punishment of an action (behavior) affects whether an individual will repeat that same action; (b) learning occurs through observing, while acting; and (c) modeled behavior in a group setting is shown in individuals who might identify with the group, depending on emotional connection and similarity to one’s self (Woodward, 1982).

Within the group of SLT scholars, Albert Bandura has been a major contributor to the development of the theory. His work focused mainly on how cognitions influence behavior and development, and he introduced the idea of vicarious learning (learning by observing), or modeling, as a form of social learning (Bandura, 1977, 1978, 1986, 1989). His focus on cognition and vicarious learning is the reason why he renamed SLT as social cognitive theory, which was a more appropriate name for his area of focus (Bandura, 1986). Along these lines, Bandura (1977) suggested the following about vicarious learning:

Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action. (p. 22)

For the purposes of this study, which are to understand architecture student learning experiences in their design studio and to understand the interaction that occurs between participants of the design studio, Bandura’s social learning theory is important to understand for two reasons. The first reason is its focus on the four abilities on which the theory is based: (a) attention—the focus that an individual might have on a topic being presented; (b)
retention—the ability to retain information; (c) motor reproduction—the ability to reenact what has been retained; and (d) motivation—having some sort of incentive to reenact the retained information (Bandura, 1986; Bandura, & Walters, 1963). An example of this theory in action is when people purchase products on an infomercial because of the advertising. The factors coming to play are attention because of the observer being aroused by the product in terms of senses and motivation because of excellent advertising (external) and justification (internal). This infomercial scenario can be likened to a design studio setting during a review when students explain their projects to reviewers. The reviewers pay close attention because of the visually stimulating physical presentation (ideally), motivation also comes to play because of the convincing oral presentation, and the reviewer has justification to give a review or comment on what they think about the student’s project. The comments will mainly revolve around what the reviewer liked, what he or she did not like, how the project can be improved, and/or whether the reviewer is convinced of the idea.

The second reason why understanding Bandura’s SLT is important is because of the connection that it has with social constructivism through Vygotsky’s SDT. The main connections between the two theories are interaction between individuals and their environment (social and physical) and the idea of cognition (Bandura, 1977, 1986; Vygotsky, 1978). Social development theory, unlike social learning theory, has a cognitive emphasis and focuses on social development (Vygotsky). Vygotsky’s work is primarily a sociocultural learning theory, but it also touches on some cognition.

**Maturationism**

Another important learning theory currently in use in education circles is maturationism, which assumes that students are at different developmental stages and exhibit
certain behaviors at these stages. Examples of scholars who work in maturationism are Erikson (1950) and Gesell (1940). Maturationism is applied by assigning tasks to students and depending on how well these tasks are performed, the curriculum is changed (von Glasersfeld, 1996). In contrast, constructivism focuses on “concept development and deep understanding, rather than on behaviors and skills as the goal of instruction” (von Glasersfeld, p. 10). Moreover, constructivism has two emphases: cognitive constructivism, which focuses more on the individual process of cognition, and social constructivism that emphasizes the social and cultural effects on learning (Fosnot, 1993; O’Loughlin, 1992; Streffe & Gale, 1995). Regardless of this disparity, constructivism as a whole is concerned with the human construction of people’s realities and not the importance of objective reality in meaning-making. Social constructivism becomes more relevant than maturationism for this study because of the importance of student interaction among the different participants in the architectural design studio and the effects that the participants of this environment might have on the culture of the design studio.

**Summary of Learning Theories**

Although there are several learning theories that seek to explain how learning occurs and how people learn, using constructivism, mainly social constructivism, as a theoretical lens in this study of the architecture design studio setting is appropriate because of the importance of the arguments that social constructivism puts forth. The first is the understanding that a good learning environment is where the interaction between instructors, learners, and assignments provides an opportunity for learners to create their own culture, emphasizing the importance of culture and context in understanding what is happening in
society and constructing knowledge based on this understanding (Derry, 1999; McMahon, 1997).

The design studio is a learning environment that has been said to be unique but also an environment from which other educational settings can learn (Dewey, 1938; Kohn, 1999; Schön, 1983). But, the question still remains: what kind of learning environment is the architecture design studio? Indeed, the rigor of teaching and learning done in the design studio has its negatives and positives (Ledewitz, 1985). In the next section, I briefly discuss Chickering and Reisser’s (1993) theory of student development, making a case for the use of the theory in this study. I then describe learning environments and their relationships to constructivism, and I also discuss how learning environments, such as the problem-based learning classroom and the learner-centered classroom, might illuminate some areas in the architecture design studio that may not yet have been considered.

**Chickering’s Theory of Student Development**

As mentioned in chapter 1, Chickering and Reisser’s theory is a psychosocial theory concerned with the development of identity in college students. The development of Chickering’s (1969) original vectors was influenced by Lewin’s interactionist paradigm (Lewin, 1936) and based on Erikson’s stages of psychosocial development (Erikson, 1950). Lewin introduced the equation, $B(f) = ExP$, where he suggested behavior ($B$) was a “function [$f$] of the interaction between the environment [$E$] and the person [$P$]” (Strange, 1994, p. 402). This equation “refers to a model where persons and environments are seen as separate entities, which engage with each other in various forms of interaction” (Cassidy, 1997, p. 43).
Erikson’s eight stages of psychosocial development are characterized by conflicts that need resolution. When conflicts arise, the person involved should try to resolve them, otherwise they might arise later on in life (Schultz & Schultz, 1987). Erikson’s stages include the following: a) “trust vs. mistrust,” b) “autonomy vs. shame,” c) “initiative vs. guilt,” d) “industry vs. inferiority,” e) “identity vs. role confusion,” f) “intimacy vs. role isolation,” g) “generationality vs. stagnation,” and h) “integrity vs. despair.” Chickering’s (1969) original theory expanded on and was also inspired by Erikson’s developmental theory.

Chickering (1969) suggested that college students move through developmental vectors where students have to address issues that are related to each vector. These issues include emotional, intellectual, and physical aspects of development. The term “vector” was used because “movement along any one can occur at different rates and can interact with movement along the others” (Chickering & Reisser, 1993, p. 34). Chickering, in the previous version of his theory (1969), asserted that it was more likely for college students to address the issues in their lives if they were purposely exposed in the campus environment to certain factors that would affect their development.

Chickering and Reisser’s most recent vectors include the following: a) developing competence—which covers three areas of competence including: intellectual competence, physical and manual competence, and interpersonal competence (Reisser, 1995); b) managing emotions; c) moving through autonomy toward interdependence—previously called “developing autonomy” (Chickering, 1969); d) developing mature interpersonal relationships—formerly called “freeing interpersonal relationships” following the vector “establishing identity” (Chickering, 1969); e) establishing identity; f) developing purpose; g)
developing integrity—covering three stages including humanizing values, personalizing values, and developing congruence (Evans, Forney, & Guido-DiBrito, 1998, p. 40).

Chickering’s theory is relevant to higher education because the vectors are used to make student affairs personnel, educators, and administrators aware of the developmental challenges that students undergo during their college years (Reisser, 1995; Thomas & Chickering, 1984). White and Hood (1989) also acknowledged this relevance in their assessment of the validity of Chickering’s vectors. This study uses this theory to understand how students transition from year to year in their design studios.

**Learning Environments**

Understanding what a learning environment is and why the design studio is or should be called a learning environment is important for the purpose of this study. Hannafin (1992) suggested that there is a continuum that shows a movement towards this understanding. A learning environment, which he described as a system that used tools, techniques, and resources for learning, is the first step to understanding the design studio as a learning environment. Wilson (1996) added to this understanding when he stated that “individuals can use available resources to make sense out of things and construct meaningful solutions” (p. 3). In other words, participants in a learning environment actively participate in the construction of knowledge, and this idea is very similar to the constructivist theory, where participants in a setting actively construct knowledge. Proponents of constructivism can, therefore, use definitions of learning environments as a reference.

Learning environments, particularly social learning environments, have four things in common, according the Hannafin (1992):
• scope—a diversity in the environment, both in the content taught and resource availability

• content integration—the diversity of knowledge integration (cross-content integration) facilitates the use of several perspectives of knowledge (within-content integration)

• user activity—Hannafin suggested that there are two types of user environments: generative and methamagenic. The former requires that students actively represent knowledge, and the latter offers ways to allow students to learn.

• educational activity—a move from goal-oriented to student-oriented learning.

Additionally, Duschastel (1993, 1994) suggested that in order for a learning environment to be supported there have to be four components: (a) information—getting learning material organized; (b) interest—using different techniques to keep participants on their toes; (c) structure—using examples to reinforce understanding; and (d) regulation—giving the participants a chance to regulate their own learning.

Design studio can be seen as a learning environment because the components that Hannafin suggested are similar to descriptions of design studio that Ledewitz (1985), Dewey (1981), and Anthony (1991) have presented. Particularly, these researchers noted a diversity of resources used to teach, the use of a more student-centered ideology rather than a goal-oriented ideology, and the opportunity for students to represent knowledge or interpret work as they work on projects and assignments. With this description of design studio in mind, I next discuss three types of learning environments that aided in the interpretation of this research.
The Constructivist Learning Environment (CLE)

The constructivist learning environment (CLE) was described by Wilson (1996) as “a place where learners work together and help each other as they use a variety of tools and informational resources in their guided pursuit of learning goals and problem-solving activities” (p. 5). Constructivism, unlike other learning theories such as behaviorism, focuses more on the development of the learning environment (Jonassen, 1994). Describing constructivism, Reeves (1992) stated, “Prime interest is placed on the unique interests, styles, motivations, and capabilities of individual learners so that learning environments can be tailored to them” (p. 117).

Although Wilson (1996) primarily referred to an instructional technology classroom, the constructivist learning environment described could also be likened to the design studio, especially when he explained the learning environment when “thinking of instruction as an environment that gives emphasis to the “place” or “space” where learning occurs” (p. 4). Furthermore, he suggested that a learning environment should have: (a) the learner; and (b) “a “setting” or a “space” wherein the learner acts, using tools and devices, collecting and interpreting information, interacting perhaps with others, etc.” (Wilson, 1996, p. 4). The tools and devices referred to are technology-based, but the design studio uses other tools and devices, such as the pencil and sketchbook (although there is also a focus on using computer technology for representation of work).

Moreover, when Jonassen, Davidson, Collins, Campbell, and Haag (1995) described the design goals of a CLE, they determined a set of elements for the design process that the CLE should encourage. The first element is knowledge construction, the second element is a context for learning which is meaningful and authentic and makes use of knowledge
constructed, and the third element is collaboration—both student to student and student to teacher—where the teacher is a mentor rather than the holder of all knowledge. To varying degrees, these elements are also part of the design studio learning environment. The elements also resemble the problem-based learning (PBL) environment, because of the interaction between members of a context and the importance of individual perceptions (Savery & Duffy, 1995).

**Problem-Based Learning (PBL) Environment**

Although not formally labeled as PBL until recently, the type of environment has a history starting from fifth century Chinese philosophers and Indian teachers (Banerjee, 1994; Boud, 1985), including European educators, and is exemplified in the Socratic method of teaching. In modern day PBL, the case-study method is commonly used in the classroom, especially in professional schools like law and medicine.

In contrast to the extensive emphasis on structure that PBL educators should have when creating a PBL environment (Hannafin, 1992), including learning objectives with specific assignments that relate to them, formulated discussion questions that enhance the discussion around the subject matter, and the provision of the background of the problem (Kanuka & Anderson, 1999; Lacey & Merseth, 1993; Meirson, 1998), the architecture design studio may not be as structured. The nature of the design studio may stem from the tradition of instructors imitating their former instructors’ teaching techniques (Anthony, 1991, Weatherhead, 1941), resulting in a reluctance to develop and hone one’s own way of teaching—a new way of teaching that may lead to a shift to a problem-based studio. On the other hand, because of the long-time tradition of the apprenticeship model and design studio collaboration (Kostoff, 1977; Weatherhead, 1941), the design studio has fallen into a pattern
of traditionalism. Nevertheless, the characteristics of the design studio learning environment can be described as a problem-based learning (PBL) environment and as a learner-centered, and even a reflexive, learning environment.

The purpose of PBL is to facilitate critical thinking, recognize and enhance student involvement, and increase the ability of students to solve problems (Banerjee, 1994; Boud, 1985; Ostwald & Chen, 1994; Shannon & Brine, 1994). Problem-based learning does not mean that the problem being approached by the learner has a single or even a correct answer, but PBL allows students to think conceptually and be able to apply concepts to practice (Cruickshank & Olander, 2002). In PBL, the students’ previous perceptions of a situation are taken into consideration (Coles, 1990), and the process that students use to solve, or attempt to solve, the problem is emphasized and determined by students themselves (Margetson, 1994; Patel, Groen, & Norman, 1991; Shannon & Brine). Moreover, Ochoa and Robinson (2005), in their study of PBL related to the group dynamics of a computer-assisted PBL module, stated the following:

The goal of PBL is to use multiple perspectives to encourage the group to develop alternative solutions to complex problems with the objective of producing better solutions, tapping the cognitive abilities and skills of students through activating prior knowledge, eliciting active participation, and eliminating hierarchies. (p.10)

One major similarity between the types of learning that occurs in an architecture design studio and a PBL environment is the emphasis on the process of design. Students are asked to defend their work through desk crits (one-to-one with the instructor) or reviews (in front of a panel of reviewers) (Anthony, 1991). But, unlike the learning that occurs in a PBL
environment, the project, even though always introduced, is not always discussed in a group unless it is a group project.

In relation to the architecture design studio, Schön (1984) observed that the medical school rigor was a prototype to which most professional schools would like to aspire because of the problem-practice method used to prepare students for real life. Regardless of that aspiration, he asserted that the design studio could still be an example for professional schools as well, because of the focus that the design studio has on the project as an assignment.

**Learner-Centered Learning Environment**

Being learner centered implies putting students’ learning at the forefront of an educational experience (Astin, 1993; Huba & Freed, 2000). Learner-centered characteristics include the following: the students being allowed to grapple with problems, using skills such as critical thinking and communication; the students being involved in collecting information pertinent to the problem; using real contexts to address issues; the teacher and the students learning together; assessment being part of the whole learning experience; learning being assessed through the work that the students produce; and using team work in learning (Huba & Freed).

Learner centeredness in the architectural design studio, therefore, depends on the academic, social, and physical environments, which are consistent with learner-centered categories that Alexander and Murphy (1998) summarized. These categories stemmed from 14 principles that the American Psychological Association (See Appendix B) suggested as learner-centered, including the requirement of (a) a knowledge base, (b) emphasis on individual differences and development, (c) a strategic process of learning, (d) motivation
and effect, and (e) the situation of the context. Additionally, in relation to teaching, Weimer (2002) described five changes that would occur when teaching is learner-centered: (a) “balance of power”; (b) the “function of content”; (c) “the teacher’s role being changed to a learner”; (d) “responsibility for learning” or self-regulated learning; and (e) “process of evaluation” (pp. 8-20).

The term learner centered includes not only learning but also teaching that considers the culture in which the students are involved (Ladson-Billings, 1995). Learner-centered theory is constructivist in nature because it both takes the context into consideration and it builds on students’ previous knowledge (Bell, 1982). Lev Vygotsky, Jean Piaget, and John Dewey were the people who began to think about and shape learner-centered education through the principles of constructivism (Henson, 2003). The benefits of learner-centered education can, therefore, be attributed to the ideas of constructivist thinking as documented by several scholars (Grimmer & Mackinnon, 1992; McCombs, 1997; Reilly, 2000; Shulman, 1987).

A complete definition of a learner-centered environment was provided by McCombs and Whisler (1998):

The perspective that couples a focus on individual learners (their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs) with a focus on learning (the best available knowledge about learning and how it occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners). (p. 9)

This definition is relevant to the architectural design studio education because these are the characteristics to which the design studio should aspire, even though the first perspective (the
focus on individuals and learners) might be present without a conscious effort.

Learner-centered characteristics such as the idea of discovery, learning from previous examples, and active learning (Huba & Freed, 2000) are typically exemplified in the design studio culture. These characteristics are not necessarily brought about by the purposeful application of learner-centered teaching techniques by instructors, but rather these learner-centered qualities have a tendency to naturally occur through the culture of the design studio that has developed and morphed from an apprentice-master model since the early 1700s. The traditional design studio culture revolves around the student, instructor, and the project, and one cannot not exist without the other, as Lueth (2003) implied. Because of interrelationships between participants and projects in the studio, the design studio dynamics allow for students to interact with each other and with the professors with regard to the project (Stevens, 1998). In Lueth’s study, additional factors that influence interaction were shown. These factors include, but are not limited to, the placement of the desks in the design studio, the number of people in the studio, and the people outside of the design studio (but within the same building) (Lueth). However, these other factors will not be part of this research.

**The Architectural Design Studio: A Unique Learning Environment**

In light of the former section that discussed the different types of learning environments in higher education relevant to this study, this section will look at the architectural design studio as a learning environment, including its pedagogy, history, and interaction, focusing on what makes the architectural design studio unique.

**Architecture Design Studio Pedagogy**

Dutton (1984) stated that “compared to typical classroom scenarios, studios are active sites where students are engaged intellectually and socially, shifting between analytic,
synthetic, and evaluative models of thinking in different sets of activities (drawing, conversing, model-making)” (p. 16). Although scholars have long praised the design studio as being a unique environment, there have also been criticisms (Ledewitz, 1985). For instance, Ledewitz said, “The lack of clarity over the purpose of the design studio reflects its complexity as a teaching learning setting” (p. 2). Indeed, studies and theories presented by scholars including Anthony (1991), Cuff (1991), Koch, Schwennsen, Dutton, and Smith (2002), Salama (1995, 1998, 2002), Sanoff (2003), Schön (1981, 1983, 1985, 1988), Seidel (1994), and Stamp (1994) concurred with Ledewitz’s critique.

Salama (2005) claimed that “the design process is intended to function based on intuition, logical treatment, and rigorous reasoning” (p. 1). Nevertheless, the intent may not align with reality because instructors tend to teach how they were taught when they were in school (Salama, 2005). So, contrary to the literature on problem-based learning (PBL) and constructivism, even though design studio educators focus on a project-based technique of teaching (Salama, 1998) and it is obvious that design students should be responding with PBL actions, students’ actions end up being constrained by the instructor’s teaching format (Salama, 2005).

Other scholars have viewed the design studio as a reflexive learning environment (Agryis, 1981; Anthony, 1991; Austerlitz, Aravot & Ben-Ze’ev, 2002; Schön, 1985). This reflexive quality is what makes the design studio stand out in higher education as a different educational environment (Schön, 1985) and is why, in architectural education, Kolb’s learning style inventory (Kolb, 1984) and the idea of experiential learning is most commonly used by scholars to study learning in the architectural design studio. An example of this type of research is a study based in China that found biased correlation between the academic
success of students with different learning styles. The investigators concluded that students who were *convergers* (are students who are more apt to be successful in conventional systems, such as tests, and are more geared toward the physical sciences) were less successful in the architectural design studios being studied than *assimilators* (students whose strength lies in their ability to create theoretical models) (Jia & Kvan, 2004).

Another study by Kvan and Yunyan (2005) expanded on the aforementioned study, attempting to relate the design process to the process of experiential learning. Demirbas and Demirkan (2003) also embarked on the same journey as Kvan and Yunyan (although Demibras and Demirkan’s focus was the design process through Kolb’s learning styles and not experiential learning). Additionally, in design education, cognitive styles, described by Messick (1984) as “characteristic self-consistencies in information processing that develop in congenial ways around underlying personality trends” (p. 61), are studied in relation to student progression in learning in architecture (Roberts, 2006, 2007); student understanding of architectural concepts in architecture (Saalman, 1990); artifact production in architecture, planning, and engineering (Akin & Akin, 1996; Purcell & Gero, 1998); and design process and cognition (Chan, 1995; Lui, 1996).

**A Brief History of the Architecture Design Studio**

The origins of the design studio are attributed to two art movements: the *École des Beaux-Arts* (School of Fine Arts) and the Bauhaus. Before the establishment of the design studio environment, design was learned through an apprenticeship model or a pupilage model, and the design professions were organized in *guilds* (Fisher, 2000; Kostoff, 1977). This type of education ensured that the master had control over the student (Kostoff). To provide a more structured education, deeming artists more credible through the development
of art exhibitions, different académies (academies) were created. The most renowned of these, the French Académie Royale de Peinture et de Sculpture (The French Academy of Painting and Sculpture) (Draper, 1977; Kostoff; Van Zanten, 1980), was established in 1648 (Lagasse, Goldman, Hobson, & Norton, 2001). Around this time (the 17th century), organized group education was established. Regardless of this group sensibility, the dominance of the master as the sole provider of knowledge remained.

Students later rose up against the École system because of the emergence of the modern movement. This student uprising in conjunction with the rise of the modern movement in architecture became a catalyst for the abandonment of the Beaux-Arts system (Littmann, 2000). The architect Walter Gropius was a prominent German leader of the modern movement (an architecture movement in the 20th century) that started in 1925 (Fitch, 1960; Nerdinger, 1985), and within the modern movement, the Bauhaus, established by Henri Van de Velde, arose (Frampton, 1985). The modern era’s educational principles were geared toward training students as craftsmen, combining art with the modern technology of the time (Nerdinger), and the modern era itself was characterized by the use of steel as a building material and the use of art and architecture to serve people’s special needs (Frampton). The modern-era teaching methods ranged from lecture courses to workshops where students would learn how to build from the day they stepped into the workshop (Gropius, 1937, 1968), while the Bauhaus workshop pedagogy, established for hands-on, interactive, and integrative learning, reinforced the design studio model as a place for all student activities to occur (Nerdinger).

The history of design education illustrates some important characteristics of the current design studio mode from its inception; however, Austerlitz, Aravot, and Ben-Ze’ev
(2002) outlined four characteristics that make the modern day design studio a different learning environment than it was in the past: (a) the reflective learning component; (b) the personalized design process, which implies creativity; (c) the instructor’s influence on the product of the project; and (d) the fact that a student’s actions, personality, and feelings are laid out in the open. In contrast to this list, the traditional classroom has characteristics such as (a) the student as a blank slate mentality, (b) a non-requirement of creativity, (c) the instructor not having a direct influence on the process students use to produce work, and (d) an attitude that students’ personalities are unimportant, mainly due to large classroom sizes. Indeed, other characteristics suggested by Lueth (2003) also make the design studio a unique educational environment unlike other environments: (a) the influence that students have on each other; (b) the influence that students could have on the instructor (in terms of creating an environment that may or may not be conducive to teaching); (c) the influence of the physical environment; and (d) the influence that the products created during class time and outside of class time might have on the students’ learning. The educational environment in the design studio, therefore, is defined as the components of the physical, pedagogical, and virtual (the classroom through the internet) space that have an effect on the education of the participants (students and instructors).

**Social Interaction in the Design Studio**

In 2003, I conducted a study on the interaction in the architectural design studio (Lueth, 2003). The study focused on the instructors’ teaching styles and interaction in the design studio and observations were made of different teaching styles and different types of interactions that occurred in the studied studio. In this section, the different types of architectural design studio interactions (peer-to-peer, instructor-to-student, interaction with
the project, and environmental interaction) are discussed. Interaction sets the stage for perceptions to be formed by students and, thus, influences meaning-making.

**Peer-to-peer interaction**

Students are a main source of information for each other. Since students spend more time with each other than they will ever spend with an instructor, it is very difficult to imagine them not influencing each other. Indeed, scholars have shown that students can influence each other negatively or positively (Alderman, 1999; Astin, 1993).

**Instructor-to-student interaction**

Faculty members are an important component in design education because they help shape the culture of the design studio (Lueth, 2003) and design studio pedagogy (Salama, 2005). Design studio instructors are not only influenced by their own life experiences, personalities, and interests, but they are also influenced by the type of education that they received as undergraduates or graduates in architecture (Lueth). Moreover, the way that a student interacts with an instructor depends on the way that the instructor presents him/herself in class during desk crits and outside of class.

Austerlitz, Aravot, and Ben-Ze’ev (2002) discussed the desk crit as a dimension through which the interaction between student and instructor occurs. They stated that the desk crit is “a complex interweaving of two interrelated design processes, the student’s and the instructor’s” (p. 4). This concept of the importance of desk crits might give instructors the impression that their responsibility stops there, in the classroom. However, interaction in the design studio not only occurs at the desk crit or formal crit; it also occurs in the hallways, in offices, walking to class, and so on. The participants in Lueth’s study recalled many interactions with instructors that happened in places other than at a student’s desk, and the
instructor has a great responsibility in the culture of the design studio to not only teach but also aid in the creation of reality in the design studio through interactions in a variety of locations (Lueth). In comparison to a lecture type classroom, interactions may not be as complex because of the one-to-one nature of the design studio. In the design studio, interactions are cyclical and there are multiple interpretations occurring at the same time, by the same or different individuals, in the several psychological and physical contexts (See Appendix B).

**The importance of the project**

Lueth (2003) described six different ways the project in the architectural design studio influences learning: (a) how well professional practice and education are connected because only certain things are taught in academics, which may not correlate to practice; (b) how well the student reaches the objective of the class because there might be confusion about the meaning of the assignment; (c) provides reasons as to why a student “stands up” to do their own project; (d) the instructor is the main contributor to the design of the syllabus, so can steer how learning occurs; and (e) expectations of production.

The problem in the architectural design studio is embedded in the project and the project can be interpreted in several different ways depending on the parties involved. That was why a problem-based learning environment is important to understand for the scope of this study. The use of real-life scenarios (the problem) to create an environment where problem solving is key, gives insight into the dynamic of the design studio. Social constructivism and constructionism are also important in grasping how “the project” played a role in student perceptions of their design studio learning experiences. Having a problem
embedded in the project, where students interact, can create shared knowledge and a shared language that aids in the students’ completion of the project or solving of the problem.

**Summary of Chapter 2**

In this chapter I have discussed literature that illuminates learning and the different learning theories that could help explain how learning occurs in the design studio, using social constructivism as a basis for this discussion. Vygotsky’s social development theory, radical constructivism, constructionism, behaviorism (including Bandura’s social learning theory) and maturationism were all part of this discussion. In addition, Chickering and Reisser’s theory of student development was discussed. Learning environments were also addressed, finally leading to a conversation on architecture design studio pedagogy, illuminating the design studio as a learning environment, focusing on the evolution of the design studio, and discussing studies on the interaction that occurs in the architecture design studio.

Since the architecture design studio is seen as a type of learning environment and mainly an environment where interactions occur, this study built on the idea of interaction and the implications of interactions in an environment like this on the design studio. In this study, I attempted to understand architecture students’ perceptions of their design studios based on interactions that occur; the literature focused on theories that relate to this interaction, and the outcomes of the interaction. The study, therefore, adds to the literature on understanding student perceptions of their learning experiences in the design studio learning environment.

In chapter 3, I discuss the methodology of this study.
CHAPTER 3
METHODOLOGY AND PROCEDURES

This chapter describes the general methodological approach that I used for this study. It explains the reasons why qualitative research was a necessary methodology to use and what epistemological and theoretical perspectives helped frame the study. The selection of the appropriate methodology was based on the type of data being sought—the narrators’ lived experiences, their voices, and their perspectives—in other words, their story (Lincoln & Guba, 1985). Therefore, I chose methods that would enable me to collect this type of data. In this chapter, I explore phenomenology as a qualitative methodology (which is consistent with my methodological and theoretical perspectives), introduce the participants in the study, describe the physical context of the design studio from first year to fifth year, discuss the methods used for data collection and analysis, and present the concerns that I had due to my status in that environment, which could be a limitation of the study.

Qualitative Research

In this section, I describe why I chose to use a qualitative methodology, my epistemological stance—social constructivism—and the theoretical perspective—phenomenology.

Why Qualitative Research?

The design studio is an environment in which subjectivity is at the center of its functioning (Anthony, 1991). This can be seen, for example, in reviews where instructors from different backgrounds can give students differing feedback. Also, students are able to give peers their personal feedback. The differing perceptions of each individual are therefore emphasized, and these “reviewers” can agree to disagree in most cases. Another example of
this subjectivity is exhibited in the grading systems. In fact, it is very rare to see grading systems that are fixed, especially since there are several factors to take into consideration when grading, such as process, product, presentation, passion, and even persistence throughout a project. One question, which goes beyond the scope of this study, is how does one grade a designer’s work when “beauty lies in the eye of the beholder”? Or in these cases, when design lies in the eyes of the perceivers. Students, therefore, have to understand that each instructor has a different set of beliefs, experiences, and agendas that shape his or her perceptions of what the quality of a product is and how they interpret it, thus affecting the way they grade it. This is not to say that design studio instructors do not have rubrics, but rubrics that are used are extremely multidimensional. I take the stance that instructors are as unique as students, especially after coming to an understanding of how the brain works and also how social constructivism can be understood through the research on the brain (Caine & Caine, 1997; Sylvester, 1995; Zull, 2002).

To understand the role that social constructivism plays in the design studio, a qualitative strategy was very appropriate to aid in the understanding of the learning experiences that the participants have in this setting (Taylor & Bogdan, 1998) or how people understand, order, and frame their everyday experiences. Qualitative researchers try to understand “how people see things” (Taylor & Bogdan, p. 7), and that inquiry brings me back to the main research question: “How do particular architecture students in a fifth-year studio describe their learning experiences in their first- through fourth-year design studios at Iowa State University?” Social constructivism is a qualitative paradigm that aids in this understanding because it is not only a theory about knowledge and learning, but it also describes both “knowing and how one ‘comes to know’” (Fosnot, 1996, p. ix).
Social Constructivism as an Epistemology

Crotty (1998) explained that an epistemology is related to a researcher, in that it is how a researcher understands “what knowledge is, what it entails, and what status can be ascribed to it” (p. 2). It was appropriate for me to use constructivism as an epistemological position to help gain an understanding of students’ learning experiences in the design studio. The assumptions of constructivism are based on three factors: (a) reality, which is constructed through human interaction (Kukla, 2000); (b) knowledge, which is socially and culturally constructed through interaction (Gredler, 1997); and (c) learning, which occurs through participation in social activity (McMahon, 1997).

The common denominator in these three factors is interaction. As previously mentioned, interaction in the design studio occurs at several levels, including peer-to-peer interaction, student-to-instructor interaction, project-to-student interaction, and project-to-instructor interaction (Lueth, 2003). This interaction is often not confined to a single studio; it is also seen between studios and across educational arenas, making the construction of reality, knowledge, and learning very complicated. It gets even more complicated when each learner brings a social context with him or her (von Glasersfeld, 1995, 1996), affecting the interaction that he or she may have with the context at hand (the design studio). Social constructivism helped focus the study on the learning experiences through interaction because of the nature of interaction that occurs between the learner and other members of the society within social contexts and the learners’ context, which determines how social meaning is constructed by the individual and the community as a whole (Bruner, 1990; Gredler, 1997; Wertsch, 1991). Therefore, constructivism assumes that no universal truth can
be discovered; instead, there is an interaction between individuals and their physical and social environments, aiding in the creation of truth collectively by the learners (Crotty, 1998).

In terms of learning, a constructivist position can also be used by instructors to give “the learners opportunity for concrete, contextual meaningful experience through which they can search for patterns, raise their own questions, construct their own models, concepts and strategies” (Fosnot, 1996, p. xi). This means that the views that the students have are their own and not those of the instructor or their peers. But, students’ views are influenced by meaningful interactions among the parties. As a researcher, I was, therefore, assuming that something could be learned from the students who are active participants in that environment. I was also willing to explore the participants’ perceptions, in order to understand them both socially and culturally, noting how they make meaning of their environment, knowledge, and learning, all of which are influenced by social interactions. In the attempt to “understand and explain” (Crotty, 1998, p. 66) this phenomenon that occurs through social interaction in the context of the design studio, it was appropriate to use interpretivism as a theoretical perspective.

**Theoretical Perspective**

Rather than trying to predict what may happen in the environment (which essentially is a positivist perspective), the interpretivist perspective emphasizes understanding what happens as the environment is being lived in and what essentially emerges as a result of interaction between participants and context. For the purposes of this study, interpretivism allowed me to focus on meaning and understanding, knowing that the experiences that individuals have in a context are all actor-laden (Guba & Lincoln, 1998). My theoretical
perspective was, therefore, framed by the epistemological position: social constructivism (Crotty, 1998).

The theoretical perspective underlying this study was phenomenology. For this study, because the audiences were primarily in the architectural education sector and also in higher education, it is important to understand the differences among types of phenomenology and what fields they are used in. In architectural education, the physical learning environment as well as social interactions between the participants of the design studio, influence the student perceptions of the design studio. I therefore needed to understand how phenomenology was used to explore the physical and social realms of human understanding. Regardless of any differences between fields, the common underlying definition for all phenomenologists is understanding and interpreting peoples’ experiences (Crotty, 1998; Patton, 1990; Seamon, 2000)

However, there are several philosophies of phenomenology that exist today (Spiegelberg, 1982). The philosophies all depend on the field of study and what is trying to be accomplished in an area of interest. Examples of these fields of study include, but are not limited to, education, environmental design, psychology, pediatrics, and psychiatry. Spiegelberg (1982), a phenomenological historian and philosopher, pointed out the different types of phenomenology that exist. These include the Husserlian phenomenology that focuses on the human consciousness (Heidegger, 1962). Edmund Husserl (1936, 1970), who stated that there are several structures of consciousness that can be identified through phenomenology, was the author of this philosophical phenomenology. His type of phenomenology that viewed the conscious as separate from experiences and thoughts is known as transcendental (Speigelberg, 1982, van Manen, 2002).
Martin Heidegger (1962) and Maurice Merleau-Ponty (1962) were opposed to this type of phenomenological philosophy of transcendental consciousness because they said that the reality in this case is based on the speculated function of the brain rather than on actual human experiences (Schmidt, 1985). Heidegger and Merleau-Ponty are considered to be existential phenomenologists because they argued that consciousness is not separate from human experience, contrary to Husserl’s stance (Polkinghorne, 1983; Stewart & Mickunas, 1990). Merleau-Ponty also added the idea of the body playing a crucial role in the experience of an individual (Merleau-Ponty; Spiegelberg, 1982). Even Amadeo Giorgi (1985), a transcendentalist, criticized the highly interpretive view of Husserl and stood for a rigorous analytical and descriptive type of phenomenology.

Another type of phenomenology is hermeneutical. This type of phenomenology is concerned with the interpretation of textual writing, dialogue, and the understanding of tradition through writing, as it relates to human beings (van Manen, 2002). Heidegger’s later work increasingly used the hermeneutical stance to interpret human experiences (van Manen). Although Heidegger and his students, and Mearleau-Ponty, were concerned with the meaning of language in a context, Derrida was considered the philosopher of pure linguistic phenomenology. This is because rather than taking into consideration language and tradition, the lived experience and even essence, he focused on the meaning of linguistics (van Manen). The text and not the subject are important in his argument. Another commonly used type of phenomenology criticized transcendental phenomenology as “I” and “me” oriented, and addressed the importance of “otherness” (Levinas, 1969; 2001). This type of phenomenology, called ethical phenomenology, is used to engage ethical considerations in phenomenological studies.
The last type of phenomenology that I am going to discuss is called *practical* phenomenology or *experiential* phenomenology. Its name is attributed to the fact that, rather than focusing on the philosophical side of phenomenology, practical phenomenologists are concerned with the application and practice of phenomenology. They are concerned with the “how” of an experience. For example, in the health profession, practitioners would like to know, “How does a woman experience pain during childbirth?” This type of phenomenology is the one I identified with the most because this study on the learning experiences of students stems from asking the question “How?” The fields that have used this type of phenomenology include, art (Berleant, 1991; Davis, 1989; Eisner, 1993; Jones, 1989), education (Fetterman, 1988; van Manen, 1990, 2002), environmental design (Berleant, 1992; Condon, 1991; Corner, 1990; Dovey, 1993; Mugerauer, 1994; Howett, 1993; Vesely, 1988), psychology (Pollio et al., 1997; Valle, 1998); philosophy (Casey, 1993, 1996); and social science (Rosenau, 1992).

Although this study’s base is an architectural design studio, it is not focused on the physical design or the physical design process of space and place that phenomenology can be used to study (Alexander, 1987, 1993; Dovey, 1993; Francis, 1995; Mugerauer, 1993, 1994, 1995; Munro, 1991; Murrain, 1993; Seamon, 1990). Rather, it is used as a methodology that some scholars (Cloke et al., 1991; Crotty, 1998; Fetterman, 1990; Lincoln & Guba, 1985; Low, 1987; Patton, 1990) place within the scope of other qualitative orientations to understand the “how” of an experience.

*Transcendental* phenomenology was important in guiding the methods of this study because the interpretations and perceptions that the participants give can help with understanding the way they make sense of their learning experiences. At the same time, I
agree with *existential* phenomenology, which considers the lived-experience as an essential aspect to understand individuals’ perceptions (Hiedegger, 1962). Nevertheless, I identify most with the practical application of phenomenology. Therefore, when I refer to *phenomenology* in this study, I refer to the *transcendental, existential, and practical* applications of phenomenology.

With these definitions in mind, I sought to use phenomenology in this study as a methodology to aid in understanding how the participants perceive their learning experiences. I also used methods informed by qualitative research and phenomenology to collect data. I therefore define phenomenology as a methodology grounded in both the constructivist epistemology and interpretivist perspective (Crotty, 1998), and developed as an analytical perspective (Schutz, 1932, 1967). Phenomenology was also described by Patton (2002) as the “meaning, structure and essence of the lived experiences” (p. 104). Unlike the hermeneutical approach, phenomenology that focuses on language and communication (Patton, 2002) of a phenomenon, this study was informed by the transcendental approach to phenomenology that focuses on the idea of understanding individual essences (Moustakas, 1994) and existential phenomenology that focuses on the group dynamic. Practical phenomenology helped me understand the “how” of the participants’ learning experiences. Nevertheless, the common denominator of all the aforementioned phenomenological approaches that informed this study is the exploration of “human beings” making “sense of an experience” and transforming “experiences into consciousness, both individually and as a shared meaning” (Patton, p. 104). This inquiry, therefore, focuses on the “what” and the “how” of the participants’ experiences of a phenomenon, as suggested by Patton.
Schwandt (1998) suggested that methodology not only allows for the understanding and reinterpretation of one reality but also of several realities, as the participants were living in their perceived reality, as indicated by Kvale (1996). The explanation of each participant’s reality is meaningful, thus making understanding experiences (or realities) individual. At the same time, group interpretations are also necessary, making group members’ perceptions and experiences constructive through their interaction.

Consequently, I sought to understand participants’ perceptions as they came to their minds, and as they saw them lived. I acted as an interpreter of these realities. Phenomenological research as defined for this study was appropriate because in order to understand the experiences of design students in their design studio, interpretations were needed. Since phenomenology used in education and by some practical phenomenologists is guided by constructivist thought, interpretations and “reconstructions” (Schwandt, 1998, p. 211) of individuals’ experiences are appropriate, not only with regard to their context but also in relation to the object of learning. Moreover, Crotty (1998) suggested that phenomenology is not just a description of everyday occurrences:

Calls upon us to put them [everyday meanings] in abeyance and open ourselves in their stark immediacy to see what emerges for us. True enough, the phenomena in their stark immediacy—the “things themselves”—will prove elusive. In describing what comes into view within immediate experience (or even thinking about what comes into view), we necessarily draw on language and culture. For that reason, we end, not with a presuppositionless description of phenomena, but with a reinterpretation. It will be as much interpretation—as new meaning, or fuller
meaning, or renewed meaning—it is precisely what we as phenomenologists are after.

(p. 82)

For all the aforementioned reasons, phenomenology was an appropriate approach to understanding the lived experiences and realities of design students in their design studios because of the clarity of deeper meanings and reinterpretation of a phenomenon it allowed.

The Participants

In this section, I first discuss the selection approach, the criteria, and the identification of the participants.

According to social constructivism premises, there is a constant interaction between the environment and the people in the environment (Kukla, 2000; Gredler, 1997; McMahon, 1997). I, therefore, next describe the students as participants, give a description of the design studio environment, and introduce myself as the researcher, who is also a participant because of the interaction that the researcher has with the students.

Students in this option studio went into the design studio knowing what to expect and were interested in knowing, reasoning, and understanding their field and interests better. Therefore, this section also describes the studio instructor, who played a role in the students’ decision to select the studio.

Approach and Criteria

The approach that I used to identify my participants was criterion-based selection. This required “that the researcher establish a set of criteria or a list of attributes that the unit for the study” (LeCompte & Preissle, 1993, p. 69) possessed.

The criteria for participant selection included the following:
1. Students must be 18 years old or older because of institutional research requirements that participants who are younger than 18 years of age must have the consent of their parents. I wanted to select participants who could consent for themselves to avoid the potential complications of having a third party involved.

2. Students must be actively participating in their fifth-year design studio. Each year, the architecture program requires that students be enrolled in a design studio.

3. Students must be interested in discussing their learning experiences and be willing to be engaged in long conversations through in-depth interviews and focus groups.

**Purposeful Selection**

In order for me to identify participants, I e-mailed each professor who taught a fifth-year architectural design studio, which included three studios for independent projects, one design/build studio, and two structured studios that required students to work on a set project. I asked the professors to send me a list of students who they thought might be interested in engaging in in-depth conversations about their learning experiences. All but one of the professors answered with a suggested contact list.

Mellon (1990) suggested two questions to consider when doing a phenomenological study: “Who might have the information you need and who is accessible?” (p. 49). I, therefore, narrowed down the participants by availability. This eliminated two design studios that were traveling during the semester, limiting the number of times that I would be able to meet with them. The elimination process left me a list of 20 students. I then e-mailed the list of students who were suggested, and out of the 12 students who replied, 7 were from a particular studio that focused on independent studies. I found this to be very interesting and, therefore, decided that I would narrow down the list even further and focus on the studio that
consisted of students who were doing independent studies. Out of the 7 remaining students, one was a student who I had formerly taught and who was also a mentor in a course that I was teaching. So, that caused me to decline his offer of participation. I then e-mailed the remaining 6 students who were willing to participate.

As I started meeting with the participants individually and via e-mail, to obtain schedules for individual in-depth interviews, one of the students suddenly stopped answering my e-mails. I tried e-mailing him several times to ask whether he wanted to meet at the designated times, but he did not reply. I was, therefore, left with 5 participants, 3 women and 2 men. I did not see a reduction in participants as a problem because I found that when interviewing fewer participants a greater depth of investigation and understanding could be achieved. This was a sentiment also expressed by Seidman (1998). Since I used in-depth interviewing as a method and phenomenology as a theoretical perspective, I was confident that spending more time with a smaller number of participants would be more beneficial than interviewing a larger sample. While a greater breadth of understanding can be gained through the selection of a larger sample of participants (Glesne & Peshkin, 1992), I instead chose to prioritize gaining a greater depth of understanding.

**Students**

The participants in this study were fifth-year design students who were enrolled in an option design studio. Since students were the central focus of this study, it was essential to take into consideration their perspective only and not any other participant’s perspective. In Figure1, a summary of the students and their shared realities are shown.
Regardless of the fact that I was interested in student perceptions, the instructor was the subject that always emerged during the participant interviews and focus group. The instructor’s personality and teaching method were important determinants in students’ decisions to take a studio when they were allowed to choose from a set of options, and I would not be doing justice to this inquiry by ignoring that fact. The instructor was described by the students as “an encourager,” a “cheerleader,” “a facilitator,” “a mind-game-player,” “eccentric,” “respectful,” “talented,” and “different.” He was also said to be strategic in his
approach to teaching through questioning and discussing possible answers. Moreover, his former students were also praised by his current students as producing “interesting,” “eccentric,” and “great” work.

When students discussed their process of choosing the studio, they believed that they had made a conscious decision to be in this studio, mainly because the instructor had the capability of pushing them to produce the best work that they could possibly produce. This information is meaningful because the themes that emerged as students were interviewed mostly centered on their instructors, regardless of the year of study. For example, one of the participants, Michael, stated during a focus group that “instructors determine what we learn, and our experience in any given design studio is based on their influence.” The students, therefore, by purposely choosing the particular design instructor, showed that they wanted to produce work that was great, they wanted an instructor who was eccentric, and they valued an instructor who was not the norm, compared to the other instructors that they had experienced in the past. Except for one student, none the students had previously experienced this particular professor’s teaching.

**Design Studio**

The design studio spaces at Iowa State University are physically located in two buildings: the Armory (which houses the first-year core design studio and second- through third-year architecture studios) and the College of Design building (which houses fourth- and fifth-year architecture design studios and a number of other classrooms and studios for all the other design fields).

The Armory is a unique environment in that it is shared between the university’s Department of Public Safety (DPS), ROTC program offices, and aspiring designers
(including second- and third-year architecture students, second-year landscape architecture students, and first-year students in the core foundations program). The building, which is open 24 hours a day, 7 days a week, used to be the old basketball arena, and the design studios are located on the former arena floor. The spaces for the studios are separated by 6-foot partition walls below a 3-story curved roof, which encourages a constant din, especially when the ROTC participants train and the design students blast their stereos.

Most of the individual studio “classroom” spaces, which hold an average of 16-20 students each, are centrally located with a hallway that completely surrounds them. The first-year design studios mainly hold an average of 20 students each, who meet at various times Monday to Thursday. These times include a 9 a.m. to 11:50 a.m. slot, a 12:10 p.m. to 3:00 p.m. slot, and a 3:10 p.m. to 6 p.m. slot. The first-year design studio is, therefore, a shared space with “hot-desks” (which cannot be personalized and are used by several people in one day) that houses approximately 120 students per semester. In comparison to the second- and third-year architecture design studios, which meet three times a week—Monday, Wednesday, and Friday—from 1:10 p.m. to 5:20 p.m. and house 70 students in any given semester (except the summer), first-year design studios are less permanent. Second- and third-year studios have “cold-desks,” space that a student can use throughout the semester, resulting in the personalization of a given physical space. Every semester, the students are randomly shuffled through the studios, where they experience the instruction of different faculty members. The landscape architecture program’s studio space is a large enclosed area toward the back entrance of the armory. This studio holds 35 students per semester.

Surrounding the studios and beyond the surrounding hallway are old bleachers which are used for ROTC training ground, and occasionally by students for critiques. There are also
ROTC offices on the west and east side of the armory and Department of Public Safety (DPS) offices on the west side. An unspoken competition for space occurs in this environment, not only between the ROTC and the design students, but also among the studios. At the center of the partitioned studios is a space called the center space, which is supposed to be used for reviews/juries/critiques but is used for a plethora of other activities such as club meetings, dining, working on class work when there is limited space in the designated studio spaces, and even sleeping.

The College of Design building, on the other hand, is the home to several design disciplines, including architecture, landscape architecture, graphic design, fine arts, integrated studio arts, and interior design, as well as their support spaces, such as administration offices, workshops, a gallery, and the reading room (College of Design library). The fourth- and fifth-year architecture design studios are scattered amongst the third, fourth, and fifth floors of the Design building, and these spaces have doors with combination locks on them to restrict entry. Each physical studio space accommodates between 15 and 20 students in any given semester, except the summers and during fourth-year second semester when over three-quarters of fourth-year students complete a study abroad program in Rome. Design reviews both from the students located in the Armory and the Design building are held in spaces on the third through fifth floors, as well as the first floor (the atrium or forum) where most of the administrative offices and gallery space are located. Some administrative spaces are located on the second floor, including a design supplies “kiosk.”

The environment for this study is important to describe because it played a big role in the experiences that students had as designers. In fact, all participants in this study interacted with the environment and described what the environment contributed. This interaction with
the environment reflects the constructivist perspective and phenomenological methodology where interaction is multidimensional within a particular context, which in this case is the physical environment of the design studio. Although the physical environment is important, this inquiry, again, focuses on the social environment.

**The Researcher**

My story as a student started when I was a participant in the design studio context. I am an insider and bring a high level of previous experience of this place physically, and culturally. Almost ten years ago, the environment was very different in my eyes, not only physically, but socially as well. When I graduated from the architecture program, I was hired as a temporary faculty member and taught for three and a half years before transferring to another department. After two years of being away, I am currently teaching in the first-year program in the architecture department. So, from the time that I graduated until now, I have looked at the Armory space through the eyes of an instructor.

My interest in student learning and understanding the students’ perspective developed in my first year of teaching, when I felt there was a disconnect between the students and me. My being just a few months past graduating gave me a false impression about how students and I would relate but contrary to my perception that I would instantly connect with students, it took a great deal of work on my part to “make” students understand that I was not there to give them a bad grade but rather to help them learn. Not only was I disconnected from the students, but the students also seemed to be disconnected from reality. In my eyes, the students were not in touch with the outside world or how things actually worked for designers. In other words, I wanted the students to think like me, but going through the curriculum in higher education and studying qualitative research methods brought me to the
realization that the realities that the students constructed were not necessarily the same as mine. I realized that I was a product of the instructors who taught me and decided that I really did not know how to teach, so I would learn about teaching as I taught.

The first study that I did with my students was a study about design studio interactions and identification of the instructors’ teaching styles in the architectural design studio. That study not only helped me to identify potential teaching styles in the design studio, but it also encouraged me to apply some teaching methods that I thought were appropriate to the setting. But, the question still remained: What were students thinking? The question became especially relevant to me when the first-year core foundations program was introduced. The program combined all first-year design majors into a singular program for their first year, which was studied in their first-year design studio. In years before the foundations program, each designated major had a studio in their first year dedicated to their field, which was contrary to the core program where students were encouraged to think generally in design terms rather than focus on one particular field. The program organization became confusing for some students who expected to learn about their field from the start. So, in terms of understanding student perceptions, another question arose: What were students experiencing as they went through this learning process?

All of my previous history as an instructor and researcher brings me to my current point of view. I want to understand student experiences because I have found that interactions in the design studio can be positive or negative, affecting decisions that students make in the long run. Although my interests include student experiences from their first-year in design studio to their fifth-year in the architecture professional program, this study focuses on the first through fourth year. Since the participating students are in their fifth-year of
study, they will be able to reflect on their previous years of study, as well as on their current experience.

**Methods of Data Collection**

Most phenomenological research does not make use of several data collection methods (Creswell, 2003). When trying to understand persons’ lived experiences, phenomenologists are primarily interested in people’s own interpretation or description of the phenomenon, in their own words and organized in their own unique way. With that rationale, phenomenologically-based interviews were appropriate for this study. However, because I was also interested in the role of interaction with others in the studio and how the studio participants constructed their understanding of the design studio together, I used an additional method that might provide additional insight into studio interaction. I, therefore, added a focus group discussion after the completion of participants’ individual interviews. My intention was to use the focus group method to begin to understand how students communicated with each other and reflected on their learning experiences and the experiential outcomes of their learning experiences together.

**Data Collection**

Two types of data collection methods were used for this inquiry: phenomenologically-based interviews and focus groups. As much as possible, I allowed the data to emerge through the use of these methods.

**Phenomenologically-based interviews**

Moustakas (1994) described the phenomenological interview as “an informal, interactive process [which] utilizes open-ended comments and questions” (p. 114). I, therefore, used unstructured and open-ended in-depth interview techniques, which Seidman
(1991) also maintained are appropriate for a phenomenological study. The interviews took the form of a conversation, creating a participant-led interview process (Creswell, 2003; Morse & Richards, 2002). Seidman (1991) stated that, “the in-depth interview is designed to ask participants to reconstruct their experience and to explore their meaning” (p. 69).

When interviewing participants in this study, I intentionally used open-ended questions. After some preliminary questions were asked in the first interviews, even more open-ended questions were derived based on preliminary data or themes, as suggested by Chirban (1996). The unstructured interview format also helped in the data analysis process because I used the protocol that Seidman suggested, which included three different foci: (a) the life story of the participant; (b) the “concrete details of the participants’ present experience” (Seidman, p.11) in the design studio; and (c) reflection on the meanings of these experiences. These foci aided the interpretation and reflection on the participants’ experiences.

For this study, I interviewed 5 participants who were in a fifth-year architecture studio. I met with the participants individually before the first interview to give them an overview of the research. After this initial interaction, the first interview was conducted. Moustakas (1994) suggested using a uniform statement at the beginning of each interview, but I felt that the idea of a statement might feel too standardized and would leave no room for a natural conversation flow, so I decided to replace this statement with a list of questions that I would use to guide the beginning of the interview and so that I would not forget to remind participants of some of the interview structure. These interview questions can be seen in Appendix E. The interviews lasted approximately 60 to 90 minutes per interview, depending on the responses of the participants, and each interview occurred 3 to 7 days apart, depending on the participant and to accommodate the participant’s schedule. When saturation
& Corbin, 1998) or informational redundancy (Lincoln & Guba, 1985) occurred, where no new information arose during the interviews to aid in the elaboration of the interpretation of the phenomenon, the interviews became redundant as well. Saturation started to occur in the second interviews with 4 of the students. The fifth student still had more to say, but we did not get a chance to meet after the third interview.

I met with each participant twice during the semester. The first interview dealt with the students describing themselves, their personalities, and their experiences in the design studio. Accordingly, the first open-ended prompt that was asked of every participant was “tell me as much as possible about yourself and your story of how you came to the architecture program.” The next prompt, though it wasn’t always the second question depending on how detailed the participant’s answer to the first question was, “describe your experiences in first year design studio.” The goal of the two prompts was to allow participants to begin to unfold phases in their lives from high school to their first year in college and then probe them to think about their experiences in light of their previous decisions to enter into the architecture program. The first interview also allowed participants to describe details of what they actually did in their design studios. Seidman (1998) suggested “details and not opinions” (p. 12) is what the goal of the first phenomenological interview should be; therefore, the interview protocol worked well for this inquiry.

The second interview focused on understanding how students felt about their learning experiences in their design studio. The interviews allowed participants to voice their feelings and thoughts about their learning experiences in their design studios and how they made sense of this phenomenon. So, participants were asked to describe their feelings, thoughts, and their sense-making, given what they had described in their first interview.
With the permission of the participants, and following the regulations of Iowa State University human subjects research requirements (see Appendix D), each interview was audio-tape recorded. Notes were also taken during the interviews, allowing for me to more effectively summarize the interview after transcription. The interviews were transcribed within two weeks of the completion of the interview to allow for some initial interpretation (the summary of the interview) to be reviewed by individual participants (member checks) via e-mail. After the second interview and before the focus group, the data were also analyzed fully, and then the participants were asked for feedback on that data analysis, which contained excerpts from the transcripts and a summary of themes. The feedback that 2 participants gave me included the correction of one statement and a reminder to erase a real name. The other 3 participants provided no feedback.

**Focus group**

My intent, when data collection began, was to interview each participant three times. After the two interviews were completed, I decided to encourage students to interact through a focus group, rather than conduct a third interview with each participant because participants had started repeating information in their second interview.

A focus group is defined by Krueger (1988) as a “carefully planned discussion designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment” (p. 18). The term “focus group” was coined by Merton et al. in 1956 (Denzin & Lincoln, 1994, p. 365), and focus groups are usually used when a considerable amount of research has already been done (Merton, Fiste, & Kendall, 1990). Though focus groups usually consist of 6-12 people (Stewart & Shamdasani, 1990), Krueger (1988) suggested that
some focus groups could be a little smaller when the participants might have more to share individually.

Although the questions used to guide the focus group were open-ended, I followed a list of questions that guided me through the themes that had already been revealed through the in-depth interviews. The questions, therefore, focused on understanding how the participants understood their experiences and how their thoughts affected them, leading to an overarching theme of what they perceived to be the experiential outcomes of their learning experiences at that point in their program of study.

**Data Analysis**

To guide the analysis of data, I used Seidman’s (1991) five steps: a) transcribing the data; (b) studying the interview transcripts, reducing, and analyzing them; (c) shaping the data and forming narratives related to categories and themes; (d) connecting themes and analyzing them; and (e) interpreting the analyzed connected themes. Unlike Merriam (2002), who strongly suggested simultaneous data collection and analysis, Seidman (1998) argued against that technique because the analyzed data may encourage an imposition of views on the next participant’s views from one interview to the next. Rather, Seidman (1991) suggested that most of the data analysis should occur after all the data have been collected. Nevertheless, he still agreed with doing some data analysis during the data collection process to identify some preliminary themes.

I gravitated toward the suggestion of analyzing all of the data at the end, although some initial data analysis occurred after the first interview in the form of a summary of the interview, mainly to allow for individual participants to engage in member checks. Since I was using a focus group to gain understanding in a group setting after the interviews had
been completed, I needed to have a thorough understanding of the interviews and an analysis of the data before the focus groups began. This analysis ensured that the emergent and analyzed themes informed the kind of questions that would be asked in the focus groups. I was, therefore, able to plan better for the focus group and direct my questions to particular topics of interest based on the participants’ interview responses, gaining an even deeper understanding of the participants’ perceptions through their experience of the phenomenon. The goal of my analysis was, therefore, to capture the essence of the participants’ lived-experiences (Creswell, 2003; Schram, 2003), which was to attempt to grasp the meaning that the participants gave to their perceptions.

Transcribing the in-depth interviews and focus group

As soon as data collection began, transcription also began. To better facilitate the transcription and also to understand the conversation as a whole, I first listened to each interview before I began transcribing. During transcriptions I added information about facial expressions (that I had noted during the interview) and verbal expressions, such as sighs, laughter, chuckles, and the imitation of a second party’s voice. I ended up making four copies of each transcript to facilitate the next step: data analysis.

Since the focus group occurred after the data from the in-depth interviews were analyzed, transcription of this data occurred at a later stage. During transcription, I started identifying the key themes that had emerged in the individual interviews, so this transcription seemed less daunting.

Study, reduction, and analysis

When I started studying the transcripts, common themes emerged, specifically addressing the research questions posed. Therefore, I used one transcript to illuminate and
mark the descriptions of experiences that were indicated; the second transcript was used to highlight and make comments about feelings and thoughts about their experiences; and the third was used to document how the participants described the experiential outcomes of their learning experiences. Each transcript was then literally cut into strips, depending on the content, and the pieces were recombined to indicate the development of themes and topics. The cut up pieces of the focus group data were also added to the analysis. So, I ended up with five large sheets of drawing paper containing tentative themes, under which excerpts from the transcripts were pasted.

Throughout this process of cutting and pasting, I took note of details, such as feelings and expression of feelings through the tone of voice, gaining insight on important areas of the data. Through this process, I was able to start categorizing themes and making sense of the interview and focus group data. In addition to underlining, cutting, pasting, and note taking, I also wrote reflections of my feelings, which also became part of the data and helped me focus on the participants’ perceptions, rather than my own. In other words, I made a truthful attempt to understand the participants’ lived experiences. This is called intuiting (Creswell, 2003). I intuited by transcribing, reading the transcription, listening to the taped interviews several times, and comparing the themes that emerged from the different participants. From this process, rich descriptions were created and interpretations of each participant’s lived experience were made.

**Shaping reduced in-depth interview data**

At this stage, I began to write narratives about the reduced data, recording it in an understandable form. The main way of sharing this data was in the form of themes to which I
could refer during later data analysis. To each large sheet of drawing paper containing interview data, I attached a copy of the narrative for each person’s reduced data.

**Thematic connections**

The fourth stage of Seidman’s (1991) process of analyzing data called for analyzing and connecting themes. When I laid the five large sheets of drawing paper on the floor, I began to make connections, specifically naming topics and categories that were common among the five participants. This step required the fifth and final, even larger, sheet of paper and the fourth copy of each transcript. Under the connected themes, I pasted the cut transcript excerpts onto the fifth drawing sheet. Labeling them, reading through them, and analyzing them led to the identification of common categories or topics under three domains: interrelations, transitions, and experiential outcomes.

**Interpretation of all the data**

The last part of the analyzing process required that I interpret the data, categories, themes, and domains. Although the interpretation process began when I started transcribing, it was more focused at the end of the analysis during this final stage. Similar to all the other stages, I used Seidman’s (1991) suggestion to ask myself the following questions to aid in the interpretation:

1. What are the relationships between the participants of the study?
2. What do I understand from the data?
3. What are the new and surprising insights that I learned from the participants?
4. How do the data relate to the literature review?
5. What are the ways the research questions guided the inquiry?
By using these questions I was able to explore the key issues and focus on interpreting the data so that it was readable not only by me but also to an outside reader.

After I began the interview process and the intuiting process had begun, I constantly compared data among the transcripts of the different participants, creating categories and themes as the analysis progressed, as suggested by Creswell (2003). These categories and themes were documented in the form of relevant statements and words, which are the essences of the participants’ lived experiences. By clustering the categories and themes, more in-depth descriptions were made of the meanings participants gave to their lived experiences. In addition, two other processes aided in the analysis and interpretation process: memoing and reflexivity.

**Memoing.** Even though memoing is typically associated with grounded theory methodology, it is a process that was useful in helping me understand where I was in the process of data analysis. Memoing also helped me separate my own perceptions and theories from the perceptions of the participants, which aided in categorizing the themes as they emerged.

Glaser (1992) described memoing “as the theorizing write-ups of ideas as they emerge, while coding for categories, their properties and their theoretical codes” (p. 108). I used memos to record ideas about evolving interpretations (Strauss & Corbin, 1998), and these memos included notes for myself taken simultaneously through the interviews and their analysis, and notes taken during and immediately after informal meetings. This process was unfolding and constantly evolving, which required constant documentation of ideas through memos. There was potential of being overwhelmed by the data, including the categories and
issues revealed, but memoing provided a way to organize and keep track of my thoughts (Taylor & Bogdan, 1998).

Moreover, the memos helped me generate ideas (Huss, 1994) through brainstorming, and these ideas assisted me with categorical comparisons and contributed to the establishment of an audit trail (Lincoln & Guba, 1985). Audit trails are the records collected throughout the research process ranging from memos, to transcripts, tapes, notes, and napkins used to scribble down an “aha” moment. Memoing also varied according to the phase of research, from a description of what I thought the participant said, to a constant comparison of themes, to the constant referring to the pre-analysis of transcribed material. Memos were, therefore, a combination of descriptions and random thoughts.

**Reflexivity.** I agree with Clandinin and Connelly (2000) who referred to “education and educational studies” as a “form of experience” and stated that the “narrative is the best way to represent and understand that experience” (p. 18). By using phenomenology, a tendency might be to depend consciously or subconsciously on one’s own interpretation rather than the interpretation that the participants give to their environment. Reflexivity, therefore, was necessary to keep myself inquiring about why I was doing what I was doing. This process of reflexivity was described by Clandinin and Connelly (2000) and Schön (1983, 1987), and helped unfold thoughts that I had about the interviews and why I had those thoughts. The process encouraged the interpretation of the participants’ voice, rather than interpretation using my own thoughts, thus allowing me to understand the phenomenon that the participant was describing.

The idea of interpretation is tied into the social constructivist position, which helped me understand the depth of qualitative research, why research in the interpretive form is
rightly called phenomenology, and how a phenomenon can be understood through the process of interpretation. A useful tool, which has already been addressed, was the in-depth interview, “which is effective in generating data about respondents’ feelings and/or perceptions” (Miller, 1997, p. 4). Understanding feelings and perceptions happens through reflexive thinking, which also can be thought of as processing information or processing actions through a lens of cultural context. Blumer (1969) referred to this as the process of interpretation.

Trustworthiness

Empirical positivist researchers discuss the validity and reliability of data, but these issues are not precisely transferable for researchers doing qualitative work, including social constructivists and phenomenologists. For research of this type, the issue is one of trustworthiness (Denzin & Lincoln, 2000; Lincoln & Guba, 1985).

Lincoln and Guba (1985) introduced the term trustworthiness as it relates to qualitative research. They suggested that being able to produce a compelling argument—that is, convincing an audience of whether the findings are worth their time—is the measure of trustworthiness. Lincoln and Guba suggested that credibility, dependability, transferability, and confirmability are the criteria of trustworthiness. In the following paragraphs I describe how these criteria were fulfilled in this study.

Credibility is the degree of accuracy with which a researcher understands or presents the actors’ perspective. Moreover, credibility can be assessed by the level of integration of the various informants’ perspectives into the entire narrative written by the researcher (Keoughan & Joanning, 1997). To ensure as much credibility as possible, I used peer debriefing, member checks, reflexivity, and bracketing.
I had asked some of my peers whether they were willing to look at this study and give critical constructive feedback, and two were willing to do this. Since my background is that of a designer, and I am familiar with the environment being studied, peer debriefing sessions with peers who are not in the College of Design allowed me to look at my research through a different lens than that of design and made me more aware of the biases that I may have had during the analysis/interpretation of the participant interpretation. In addition, a colleague in the College of Design who was also interested in design education and learning, listened to the findings of this inquiry and gave me feedback on the interpretation. An example of the benefits of peer debriefing was clearly shown even while I was developing the idea for the dissertation. I constantly referred to the design studio, with the assumption that my peers knew what occurred in a studio. However, my peers helped me realize the importance of both focusing on the phenomenon and yet at the same time being very descriptive since not everyone is familiar with the studio environment. It was, therefore, beneficial for me to share my research process with my peers, as suggested by Anderson and Jack (1991).

When analyzing the data, I took into consideration my familiarity with the subject matter. I was sensitive to that fact and attempted to keep myself from getting caught up in the frenzy of what I thought and felt, which Kleinman (1991) warned against, and reminded myself as much as possible that I was writing about someone else’s life experiences and using those experiences as data for interpretation. Focusing on others’ perceptions meant consulting with the participants and making sure that I had interpreted what they said correctly. However, this focus on others did not mean that I could not express to them what I thought, because I believe in being honest and open with the participant, as Clandinin and Connelly (1994) and Glesne (1999) stressed.
Establishing credibility was not a single step. I went through a refining and a re-refining stage, wherein I looked at the material collected, revisited recorded interviews, and compared them to the interpretations that I had. I also verified that the interpretations were the respondents’ interpretations and determined whether they were consistent or anomalous. This process, of course, led to more data collection and interpretation, but following up with the participants strengthened the analysis.

*Dependability* is the assurance that the data are stable and consistent. This was addressed through member checks and audit trails, which have been previously explained.

*Transferability* is the ability to apply the findings to other settings. Qualitative interpretations cannot be directly applied to other situations (Creswell, 1998) because what one person experiences may not be what everyone else experiences. In addition, what occurs in a particular context may not be what occurs in a context with similar characteristics. This does not mean that the participants’ interpretations will not be beneficial in understanding the whole context, because I anticipate that they will be.

*Confirmability* is making sure that the research is based on the perceptions, or the interpretations, that the respondents have of their environment (Lincoln & Guba, 1985, Marshall & Rossman, 1989). During the interviews and after I had transcribed the interviews and focus group, I wrote short interpretations on what I thought they had voiced. I also was reflexive in this process by jotting down and describing how I felt and why during the interview, transcription and interpretation process. I gave the transcripts, interpretations, and also some of my reflections to the participants to check, so that they could let me know if they felt there was any misinterpretation. Member checking allowed the participants not only to read over the transcripts and the interpretations, but also some of my reflections that I
thought might help in their understanding of me as a researcher. Member checks were therefore useful in confirmability, and gave satisfaction to the participants and myself in ensuring that the research was a correct reflection of the student participant’s experiences.

**Summary**

In Chapter 3, I gave a description of the methodology, epistemology (social constructivism), and theoretical perspective (interpretivism) I used for my study and why they are appropriate. I also provided a description of the participants of the study, including the students, the instructor, the physical design studio space, and the researcher. I then described the methods that I used to collect data, which were phenomenologically-based interviews and a focus group. The strategies used for data analysis were also described, indicating how memoing and reflexivity aided in the data analysis process. This description then led to a discussion of the trustworthiness of the study.

In Chapter 4, I will present and analyze the data.
CHAPTER 4
FINDINGS

The previous chapters introduced the topic being studied, highlighted the relevant literature with regard to the topic, and described the methodology that was used to conduct the study. This chapter focuses on describing the findings that address the research questions, drawing from the literature and theory that underpin the findings.

The design studio has been central to architectural education for more than a century now (Fallman, 2006), and its characteristics have not changed much over the years. But, for more than a decade, the role and importance of the design studio in architectural education has been debated. In 2001, there was a call by the American Institute of Architecture Students (AIAS) Design Studio Culture Task Force (2002) to think about aspects of design studios that affected students, and the task force made a call for change. These design studio aspects were considered by the AIAS Design Studio Culture Task Force to be the design studio culture, although the aspects actually described the culture of architectural education. Therefore, this study takes the stance that the AIAS Design Studio Culture Task Force’s idea of design studio culture referred to the meta-design studio and, hence, the culture of architectural education, which includes design studio teaching, rather than design studio culture. Design studio teaching includes teaching styles, pedagogy, student learning, the project, and particularly for the purposes of this study, learning experiences in the design studio.

In light of the definitions of the architectural design studio culture, the purpose of this study was to explore the learning experiences that architecture design students in a fifth-year studio had in their first-year to fourth-year design studios. The goal was to understand the
way that these students, in this particular setting, attached meaning to learning in their first-year to fourth-year design studios.

In this chapter, I first describe the participants of this study, focusing on their characteristics and how the participants described themselves and their lives in relation to the architecture program. This description is important because some of the findings were centered on these characteristics. Then, answering the research questions, I address how participants described their learning experiences. Next, I communicate how students thought and felt about their learning experiences. These thoughts and feelings about their learning experiences in their design studios revolve around the descriptions of their learning experiences. Finally, I point out the experiential outcomes of the participants’ learning experiences in their design studios.

**Description of the Participants**

Five fifth-year students were interviewed and participated in a focus group.

**Clare**

Clare, who was originally from Cedar Rapids, Iowa, was planning to start afresh after graduating. She wanted to move to Boise, Idaho to join her fiancé who had graduated from Iowa State University in the spring of 2006. Although she was excited about her move, there had been challenges about the way things had happened. Her fiancé lived in another state and graduated one year before her, so Clare wondered what she was still doing in school. She started working at architectural firms in high school, and although she was working in a large firm of over 30 people at the time of the interview, Clare loved working in a tight knit five-person firm that she had experienced in 2005. She was accepted into the professional
program the first time she applied and was eager to graduate. Clare was 22-years old at the time of the interview.

**Monica**

Monica was paying her way through college, with the help of student loans, and even though school loans helped, she had to work throughout college. The fact that she worked to make ends meet gave her opportunities to work in a governmental venue. Being from a small town in eastern Iowa, Monica did not have the opportunity to research other universities because of the lack of feasibility of going to school at a more expensive university. Monica decided she wanted to study architecture in high school, but at the time of the interview she faced the question of whether it was the right decision to choose this field in light of some of the challenges that architects face. Monica came into her first year of architecture with knowledge about drafting. Other than that, she worked extremely hard and did not get into the program the first time around. The year of her participation in this study was, therefore, her sixth year at Iowa State University.

**Judy**

Originally from Pella, Iowa, Judy knew that she wanted to go into design from the time she was in high school, and she knew that she did not want to draw because she said that she could not draw. So, instead of going into a major that required that skill, she decided to go into architecture. Little did Judy know that drawing was part and parcel of the architecture professional program. Nevertheless, this fact did not deter her. She persisted, applied to the program, and got in the first time that she applied. Judy wanted to get licensed after graduating and was very interested in becoming an architect in another country. She specifically mentioned Canada or Ireland because of the quality of the buildings and how
they are actually built to last over 100 years. Her experience in Rome and a trip with her mother to Europe the summer after the Rome exchange program opened her eyes to this possibility of working outside of the United States. While she was waiting to embark on her international career, Judy was working at a firm, which she said she liked.

**Luke**

Luke never really liked school and was in the architecture professional program because he had no choice but to go to school his first year after high school. Before coming to Iowa State University, Luke had visited a community college where he was discouraged from enrolling in their drafting program because of the inflexibility of the field. A friend of his encouraged him to go into architecture because he was going into the first-year program as well. After enrolling at ISU and applying to the program, Luke received a letter from the architecture department informing him that he did not get into the professional program. At that point, he made up his mind that he was going to move to California and pursue a career in construction. In fact, he was pretty excited about the plan. A few weeks into making arrangements for his move, he received another letter from the architecture department stating that someone had rejected the offer to be in the program and he was next on the list, so the offer was made to him. Reluctantly, and with his mother’s prodding, Luke found himself in the second-year architecture program at ISU. He was not happy about abandoning his California plans, but felt that he had to be in school so that he could have some sort of career. During the time of the interview, Luke was not working, but he had spent his summers, since his third year in the program, working at an architecture firm.
Michael

Michael enjoyed snowboarding during the winter and camping in the summer time. He is also was an avid golfer, and if he had not been in the architecture field, he was going to be a golf pro at a country club. In fact, he likened the process of becoming an architect to that of becoming a golf pro, where the training was rigorous and an apprentice had to work under the instruction of a mentor until he or she was capable of taking the test to become certified. Michael’s father was in an architecture program for three years and quit to study mechanical engineering, so when he heard of Michael’s interest in architecture, he was ecstatic because of his regret of not going through the program himself. Since he was 5 years old, playing with Legos in his basement, Michael always knew that he wanted to be an architect and would not even trade it in for his other love: golf. Michael was, therefore, not discouraged when he was not accepted into the professional program when he first applied. He reapplied the next year and was accepted.

Research Questions

In this section I list the research questions.

The three questions that guided this study were:

1. How do particular architecture students currently taking a fifth-year design studio describe their learning experiences in their first- through fourth-year design studios at Iowa State University?

2. How do particular architecture students currently taking a fifth-year design studio perceive and give meaning to their learning experiences in first- through fourth-year design studios at Iowa State University?
3. What are the experiential outcomes of the learning experiences of fifth-year architecture students in option studio that are exhibited in their fifth-year?

**Themes Emerging From the Data**

The themes that emerged from the data related to the research questions are discussed in this section.

Data from interviews and focus groups were analyzed to address these questions, and the analysis of the data showed that three main domains framed the participants’ views. The first domain was interrelations, which framed the idea of collaboration or non-collaboration in the design studio. The second domain, transitions, framed the series of learning experiences that occurred from year to year, facilitating the participants’ thought processes about their learning experiences. The third domain was experiential outcomes. These experiential outcomes framed how participants’ learning affected them, what their thought processes were, and how they felt and conclusions to which they came, due to their learning experiences. This experiential outcomes domain, as I perceive it, is also an opportunity for further study, meaning that “experiential outcomes” is the phenomena that occurred as a result of interrelations and transitions. A study of experiential outcomes of learning experiences in a design studio setting would be a very useful inquiry in itself.

**Interrelations**

When students were asked to describe what their learning experiences were from their first year to fourth year, the two major categories that emerged were learning as self-driven and learning as interdependent.
**Self-driven learning**

Under this category, participants found that learning was self-driven in terms of the completion of tasks, understanding concepts, and gaining skills.

This is how Michael explained his experience in the first-year program with regard to self-driven learning:

Well, high school, I don’t think I read anything or studied for any tests, and passed with, I mean, passed with great grades. So, coming up here, it was a pretty big shock to, uh, have to be working all the time and, I guess, instead of having things just kind of laid out in front of you and having [to] complete tasks, you actually having to formulate your own process and having your own ideas of doing things. It was different, I guess, not really hard.

He also talked about the first two years of design studio in this regard:

We knew what we were doing, but we just, I mean, none of us really got any of the projects then. We were still thinking pretty straight forward then, just still completing the tasks and…I just remember showing up at my review and, uh, my motion assembly, and I had put a lot of work into it, I thought that it was so cool and they [the reviewers] just kinda looked at it and they were like “ok…” You know like, they really didn’t have anything to say about it. So, that was the first time that I knew it was about not just doing the work… it’s how you do studio, it’s how you also have fun with it as well.

Judy described her frustration with the teaching methods of the professors in her first and second years because of what she perceived as the lack of direction they provided, but then
admitted that their type of teaching was a necessity because of the nature of the design studio and the architectural field:

It used to really annoy me because I am the kind of person who likes to be taught and I like learning from being taught. But, I think I was forced to get used to it because it helps you to do the work independently because there is not always going to be someone over your shoulder telling you what to do, and you are going to have to learn to work on your own. But it probably is important that they don’t [give too much direction], that they are not really strict in their direction of you, because when we graduate we are going to have to figure out things at work for ourselves, and we are not always going to be able to go to the head guy every time and ask him how would you do this and how to do that, you know, so, you’ve just got to practice.

In their reflections, the “lack of direction” continued into the fourth year, but unlike Judy, Michael was very open to that idea of being self-driven in his fourth year during their semester in Rome. He compared the design studios in Rome to the studios that he had previously taken and came to the conclusion that there was more structure in the latter:

And over in Rome there was not really any of that [telling people what to do]. You were, like, introduced to the city and you toured around and they showed you all this different stuff and there was just, there was so much to think about and, I mean, so it was kind of figuring the one thing that you were interested in and then basically forming kind of an independent project from that. And then developing something from that and you doing it on your own and not having things laid out in front of you and kind of, to kind of push you in the right direction and then bringing you in and
then letting you go... it was just, kind of, here’s all the stuff and just pick something and produce something.

Similarly, Judy also talked about the fact that when students were given projects there were broad guidelines on what to do, but students were expected to define what they wanted their projects to exhibit. She specifically talked about her third year when she had a realization that sustainability was a big issue. After that, she tried to incorporate sustainability into her designs through the guidance of her professors:

I think that my third year professor was the one who really opened our eyes to it [sustainability] and that was probably like two years or three years ago. And now even in this design competition it is required... In fourth year, we [my professor and I] talked about the issues that needed to be addressed. And we kind of defined the projects ourselves and sustainability was brought up and that was the key.

Monica talked about the skills that she came in with but concluded that she had to teach herself certain skills:

I came in with drafting knowledge from high school and first year I learned how to build, like model-making and what not, but nothing much. I think that they tell you that you learn that on the way, but you have to teach yourself how to do it. So we are not really taught how to do it.

**Discussion of Self-driven Learning.**

Participant voices were consistent with what Hannafin (1992) suggested when she described a learning environment as a place where students actively participate in knowledge construction. Their views on the lack of direction and fact that they had to initiate their own learning were apparent. Also, constructivist theorists’ view that students actively create
knowledge was also very apparent in the comments made by students. For example, an active thought process is exhibited when Monica recognized that she would have to teach herself how to build models. Her realization of the need led to her action to correct the situation. She actively participated in her knowledge creation of artifacts. Participants therefore had to “figure out” how to “do it by themselves,” through active participation.

The difference between the learning environment that Duschastel (1993, 1994) described—where there is information given, structure and motivation provided by the instructor, and self-regulation on the part of the student—and the design studio learning experiences, is that, no matter what year level, participants described studios as consisting of a large amount of self-regulation, or what I call self-drive. Although Michael described the structure that existed in first- through fourth-year first semester compared to the Rome studio, it is also clear that the structure that he referred to is not as rigid as Duschastel would have labeled a classroom of that sort to be. Also, participants commented that in projects there was a lack of information given to students. This gap between current skills and the expected product required that participants inform themselves on how to go about doing things. Yanar (2001), in his study of the self-regulation of architecture design studio, also commented on this fact.

The participants recognized the self-guided tendency of the architecture design studio, and therefore, its lack of structure. So, Duschastel’s (2001) definition of a learning environment does not seem to fit the design studio. What was interesting was that students were able to reason through this phenomenon, understanding how it led to creating their learning experiences, and even though not all experiences were positive, all were meaningful to their learning in design studios. The learning experiences in terms of being self-driven,
were composed of a) the completion of tasks, b) thinking through the framing and organization of their work, c) learning various design and communication skills, and d) coming to conclusions of “how to do design work.”

**Interdependent Learning Experiences**

Participants spent a great deal of time talking about themes that fell under the category of interdependent learning. In the descriptions of their learning experiences, interdependency can be likened to the idea of constructionism, where knowledge and meaning are individually created, yet at the same time, there is a dependency on the relationships in the learning environment. The dependency on relationships allowed for a sharing of individual constructions and the generation of other meanings due to these interactions. These meanings can end up becoming shared meanings.

**Student-to-student interaction**

The students’ interdependence on each other and their professors played a major role in their learning experiences. Luke described the interaction with his studio group during his interview, pointing out that the students had get to know each other, making their learning relational:

> It is a completely new thing to be working in this kind of a group. It was such a different thing working on a big project with different people and how you work through getting to know each other or learn each other’s habits and styles, while trying to produce a good project all at the same time. It was kind of fun and all challenging at the same time.
Judy also commented on group work when she described the awkwardness about her first group project in the second year. She had doubts about the way the groups were placed together:

I think that they made us do a group project right at the beginning, and that was weird because I mean I didn’t know many people, and I assumed that other people knew more people than me because they were in the learning community, but I think that that was weird to be immediately in a group with somebody.

Although she said that she learned techniques of doing (making and drawing) from other people in design studio groups, Judy was also clear that she did not like to work in groups because of her personality. She did not see herself as similar to the other participants and felt that her personality clashed with others in her design studio.

Moreover, Monica voiced her thoughts on how some groups in her second-year first semester studio were created:

Coming in second year, my studio when we had to do a partner project, so we like selected these words and mine was envelope and we had to partner with someone with another word and try to make a model from that… well… that really didn’t work out because everyone kind of partnered up with someone that they already knew, instead of actually doing the actual assignment. So, I actually ended up with someone who, obviously, he didn’t know anyone and I didn’t know anyone, so we ended up being partners, and I think that kind of hurt everyone’s project in general. I laugh at it now but that was kind of really frustrating.

Clare discussed her relationship with her group members and how they affected her emotionally. She suggested that she needed all her teammates for their project to be
completed, but at the same time, in the first year, she struggled with the idea of having to rely on group members to say the right thing during reviews.

I was so nervous for my first review. I mean we had a good project, but I was petrified of my group members, because one of them was kind of an idiot and he talked a lot and all of us were just afraid of what he was going to say. And I think I hated that because I did not have control of what he would say. So, I know that we had a good project and I remember that we sawed\textsuperscript{2} it, but I remember being up there and sweat pouring from me, saying, “I hope he doesn’t say anything stupid. I hope he doesn’t, you know, dig us all into a hole that we can’t get out of.” And after surviving that, I knew that I could survive anything now. I mean, it was my first review and it didn’t go bad, and he didn’t say anything stupid.

Michael talked about his way of working and how it affected his group members. Although he talked about helping others and forgetting about himself, he also said that he had experienced group members in his first year being anxious about him completing his part of the project:

The one thing that I remember the most is that for the precedent project we did a series of drawings, and then we did two sections and a floor plan. And I remember the other girl working on hers pretty consistently and just kind of sitting down and getting it done and she pretty much had hers all done, and she was just really worried about mine because I was just being very careful at the beginning stages and lining things up perfect and hadn’t really started shading it and they were all worried about me

\textsuperscript{2} As part of their first-year project, students were assigned to build a detailed three-dimensional replica (model) of a building. They were then instructed to saw it in half to test durability and, more importantly, allow for them to draw two-dimensional sections from the model.
getting it done… I guess they worried about me a lot… [he thought about that a little]
But, I mean, I got it done. It all came together, but I don’t know. I feel like when I am
in a group with people, they kind of think that, I don’t know if this is true or not or if
it’s just me just making stuff up, but, they kind of feel like I am not doing as much
and then me thinking that they think that, then I like try to do more and then, I don’t
know… I like to do everything! So I have a tendency to, like, maybe help everyone
else with their stuff and then put my work off until the end or something… so…

Monica shared a similar experience as Michael and explained, “I think like group projects.
They help us develop, but someone always gets, like, stuck doing all the work and then you
have some other people putting in all the effort compared to others.”

With regard to the social aspects of design studio, participants also told stories about
what they would do to support each other socially and emotionally in the studio setting. Judy
told a story on this topic:

In second year, I did a few all-nighters, and I sat right across from [mentions the
name of her friend], and we were right across from each other for two days straight.
He was sitting there drawing, and he is sitting there like this [demonstrates] and all of
a sudden, he drops his pencil and wakes up. I would start giggling. It was really
funny, but I would try and keep him up. Uh, we always said that we were the best
because some people qualify an all-nighter as staying up at night but taking a nap on
the couch during the day. But, we actually can say that we stayed up for two days
straight. I actually used to have the energy to do that, but I don’t anymore.
Luke also talked about the interdependency of learning in the design studio in relation to the social aspect, about relying on each other to make the studio a working environment where students would want to be. When asked how this was done, he said the following:

Well, I guess we were kind of stuck with each other because everybody was there [in the fourth-year design studio] all the time. It was pretty much the same thing, but we would do anything just to make it a little more fun than just sitting there and working on studio. I don’t know… uh… we would sometimes sing to the whole class… yeah, we would just try and make the atmosphere as light as possible.

Judy also described her experience with her best friend with regard to the social aspect of her learning experience:

I sat right across from one of my best friends, and I think studio was so much easier because we were both there and be talking and working on stuff. And towards the end of the semester, and when she was drawing she would have her desk all the way up, so we [Judy and another friend] would talk to her without seeing her and every once in a while she would walk in while I was talking to her, and I would be, like, “Oh! I thought you were back there and you weren’t.” It was strange… But it was a lot of fun knowing that when you come into studio, you would be there and just hanging out, while actually getting stuff done.

Additionally, Judy elaborated on her experiences of interdependent learning. She experienced learning from peers who were in other physical design studios than she was:

But in previous studios where all of us are working hard, and there are late nights, and one of us is stuck, we are always going to ask each other questions and I think that that kind of just goes for everyone. We are always going to help someone. And for
the most part, my friend [mentions the name of the friend] and even though we are not in the same studio, we will sit down and say “Hey, can you come over here, and can I talk to you about this?” and she does the same with me, and there is just a number of people where we can do that.

Judy had a conscious understanding about how her peers had assisted her growth academically. In her description of how her peers helped her she said the following:

Well, um, model building. I had no idea how to start out building a model, but after seeing how other people go about it, I learned to do things like that, and, um… just seeing other people’s ideas on how to solve a problem and you are probably not going to use their solutions in the project you are doing, you know, in the project that you want to do, but you might want to take that idea on with you and try to apply it later. I never really… a lot of people, I mean not everyone, but some people, study for other classes in groups, and so they apply things that they learn in other classes that way. I don’t work with people that way; I am just conservative. I don’t really study in groups, but… I think the biggest thing is just learning how to use the tools that you have and what kind of tools they are. I mean, you will have someone who has some funky material in their project and you remember that and you are going to probably use it later, if there is a general point or having a certain drawing style, you will know more and more about it.

With regard to the academic interactions, Monica also talked about how she affected the peers in her studio when they needed help with a critique:

I try to give good feedback, and I try to keep it positive. Like I will tell them if something is not going to work, maybe “try this” and I won’t be, like, “it’s not going
to work” and then leave. I try to, like, give them a different option. Make them think about it, I guess. Like, I don’t want to get bad feedback and not have a positive reinforcer.

Both the academic and group dynamics are shown in terms of feeding “off of each other.” Michael described how students created chain reactions through one person’s persistence to produce work:

I think that everybody in studio is competing against each other to do better than the person next to you. So, when someone starts doing a whole bunch of stuff, then the whole studio kicks into gear and tries to catch up. So, I think the relationship behind that, I mean, everybody is trying to be friendly in a way, but everybody is still peering over your shoulder to see what you are doing so they can one-up you. So, the whole, um, kind of how the studio works that way has affected us because you don’t want to be behind.

**Professors**

Michael explained how the interaction with his professors helped him think about things in a different way in his second year:

So my first-semester professor was really off the wall. But it was good, because it kind of got me thinking in the opposite way instead of thinking straight forward. And then, having my second-semester professor, it was pretty helpful, trying to bring back things together a little bit after being “off the wall.”

Although participants’ learning experiences were affected by professors’ interaction with them, communication with professors, as Judy compared, was worse than communication
between students. She stated, “I think that we [the students] are better at communication in studio with each other, than with our teachers.” Nevertheless, she also said the following:

[Mentioned the name of a third-year professor] was not only a teacher, but he was a cheerleader. And no matter how badly I was doing, he would try and make me excited about it [my project], and I think that is a lot of what good teachers do. They just make you excited about your own projects so that you will want to work on it more, because they can’t work on it for you. They can only give you suggestions on what changes you can make, but they can get you excited and help you when you are stuck and help you, you know, that kind of thing. Studio teachers usually should push you along and make you feel excited and not do much teaching, and in return, we produce great work that they can be proud of.

Therefore, Judy perceived that interdependency played a role when both parties relied on each other for something. In that case, she needed that cheerleader, and, in her perception, the professor wanted output that would give them something that they could be proud about. This was her interpretation of a statement made by a faculty member.

A good example of a cheerleader was illustrated in Luke’s story when he went to Rome. His professor not only expected great things from him, he also pushed him in a certain direction, similar to the example that Judy gave:

So then [mentions the name of his professor] was my professor there, and I think he had ulterior motives about what he wanted me to study. But, I guess that’s a little bit beside the point. So, I told him these things [what he was interested in] and, so he said “I have a book that I want you to read”… It was Brunelleschi’s dome. So I read it, and got interested in Brunelleschi’s methods of creating the dome and just how
innovative he had to be. And even that, especially that, the design he thought up and he wanted to create, there weren’t even machines at that time to even create this thing. Well, so the first half of the semester I spent trying to figure out this machine that he made ’cause all I had to go off of were sketches that people had done, you know, however long ago… so that was the first part of the semester, and then it came time to start working on the final projects and [mentions the name of his professor] I know that the whole semester he had in mind that one of us was going to build one of Brunelleschi’s machines. I know he did [laughs], and I was the sucker who went to it. And the whole semester he was like “When are you going to build the machine, Luke?,” “When are you going to build the machine?” and I said “[mention’s professor’s name], I’m in Rome! We don’t have tools here. I don’t know where a lumber yard is here. I don’t even know how to talk to somebody, to see what kind of wood I can get here!” And he was like, “Um, well” [shrugging his shoulders]. And just the whole semester he was, like, “When are you going to build machine?” Well, so I kept giving him things that I can do in the semester, so maybe since I am interested in this whole invention thing, I can look at something like this for my final project. He’s, like “Well, if you do the machine then…” He didn’t even like say anything about the whole proposal that I gave him, “Well, if you know, if you think about this machine…” [Imitating his professor]. Well, I ended up building the machine… [rolling eyes]. I don’t know if you have had a chance to see the exhibition, but I ended up building the stinkin’ machine and, uh, I mean it was so much fun. 

Since Luke had recently come back from his exchange to Rome, he talked about Rome for the majority of the first interview. Nevertheless, he mentioned that Rome was a turning point
for him in terms of what he wanted to do in his fifth year. Luke’s professor helped him by challenging him to build something he would not have built before.

Complementing Judy’s and Michael’s experiences, Clare also spoke about her interaction with her professor in her third year:

I think that the professors mostly worked well with us and then we started doing, like, more individual desk crits and then that really helps a lot. And then you can have your one on one with your professor and they can get to know you and how you work and then you can feed off of each other.

Regardless of this dynamic, Clare said that reviews can be unproductive in terms of feedback, when the professor is relying on the students to help critique each other:

Sometimes when you do more pin ups or open class presentations, it’s hard because some of the feedback from the peers, I guess, you take it like a insult. I mean half the time they are just as lost as I am, so I am not sure whether I want to listen to what they say. And then, sometimes some of the professors would expect the class to speak up more and if they wouldn’t they would like kind of be like, “Alright, I got nothing out of that, and so now where do I go?”

Discussion of Interdependent Learning

The first way that participants described their interdependency on each other was by discussing the importance of their academic interdependency through group projects. Not only the process of being placed in groups affected their learning experiences, but also their contribution to groups, the other group members’ contributions to the group, their attitude toward the group, and their attitude toward the work produced in the group. The group dynamic is exemplified in the idea of problem-based learning (PBL) where students rely on
each other to solve problems (Boud, 1985; Ostwald & Chen, 1994). Interestingly, the process that was used for group selection also affected the way that some of the participants viewed the group dynamic.

The second way that participants described their learning experiences was through the social aspect of interdependency. Their social activities helped them think about ways that they were kept “sane” as one participant described it and also how the activity created an environment that was “fun.” This theme of social interaction is significant because some of the participants, including Judy and Clare, found that they were more likely to work at home due to the studio being too much of a “social” place. In other words, students in their design studios spent a great deal of time talking about non-studio related things and playing around. Luke, in contrast to Judy and Clare, saw the social aspects of the design studio as alleviating stress and creating an atmosphere conducive to learning. The social activities that were beneficial, as reflected by the participants, included both socializing while, at the same time, getting work done.

The third area of their interdependency was focused on their academic activity. One of the AIAS Studio Culture Task Force (2002) aspects is student-to-student learning. The participants in this study showed that their academic activity was highly influenced by the other participants of their studio. Students relied on each other for individual and group critiques. Additionally, students specifically referred to their “best friends” or people that they knew well as the people who they might rely on, sit next to or across from, and, in turn, give and receive critiques. Academic activity occurred during reviews within a particular studio and also between different studios, but participants were clear that the cross-studio dynamic did not occur regularly, especially after they were moved to the College of Design.
studio facilities, where the physical environment affected their need or drive to ask for help across studios. The physical space in the Armory, as the participants suggested, was more conducive to cross-studio interaction.

The fourth prevalent interdependency theme addressed the understanding of how the participants were emotionally and physically affected by their group and studio members, in the completion of projects and production of work in studio.

According to the social constructionist paradigm, students interact with each other and make meaning of their environment and experiences. For instance, Papert (1991), stated the following:

Constructionism… shares constructivism’s view of learning “building knowledge structures” through progressive internalization of actions… It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it is a sandcastle on a beach or a theory of the universe. (p. 1)

This idea is primarily seen under the theme of academics, where students are feeding off of each other to improve their projects. Although the design studio learning environment exhibited the characteristic of self-regulation and the learner-centered classroom that Weimer (2002) explained, students also relied on each other to understand the projects. This idea of interdependency also falls within the problem based learning ideology, where one person’s answer or even one’s own answer is not the only answer to a solution (Cruickshank & Olander, 2002). Instead, the ability to solve problems is enhanced by the group mentality (Ostwald & Chen, 1994). Also, as noted in constructivist learning theory and the constructivist learning environment, when students work together, their individuality in their
environment is revealed (Reeves, 1992). Unlike the rigid structure of the constructivist learning environment that was suggested by Jonassen (1994), the design studio environment described by the participants at all year levels was loosely run by the instructors.

Second, the data also showed that students build knowledge structures in their social interactions with each other in the design studio. All the students concurred that social interaction mainly occurred in the design studio physical space, although there were cases, especially over the weekend, when students would interact outside the design studio. Although not all of these participants considered themselves “the norm,” for a design student, the sense that participants made out of their interactions and in the design studio was that of a reliance on each other, hence their interdependency.

The question that this section was guided by was, “How do particular architecture students in a fifth-year studio describe their past learning experiences?” The domain that emerged was, interrelations and the categories were, 1) self-driven, and 2) interdependent.

In the next section, I present Transitions.

Transitions

Students in the study found that they experienced various progressions of learning as they went through their first through fourth years. Instead of talking about these learning experiences as a linear process from their first to fourth year, the students discussed the learning experiences in terms of overlapping progressions due to their learning experiences. So, regardless of the linearity of the design studios completed, participants’ learning experiences overlapped between the years. But, what they thought and felt about their learning experiences depended on the year that the students were in. Their thoughts and
emotions, their relationships with others, and also their persistence in the subject matter were highlighted during the interviews and the focus group.

**First and second year: Confusing/frustrating**

The participants consistently considered their learning experiences in first year and second year as confusing and frustrating. Monica described her frustrations in this manner:

Definitely looking back at it [her learning experiences], I find it frustrating. Just the fact that now that as you evolve you become a lot quicker at making models, doing drawings, but second year it was like a learning process. Everything came a lot slower—work, all-nighters.

Similarly, Judy described her frustration in first-year design studio, although she talked about her frustration as a challenge that she was able to overcome, proving to the reviewers and her professor that she could actually do the project:

I remember the professor asking me, “Why did you choose this iron?” and I said “Well, it was the iron I had!” It was really curvy and he really didn’t think that I could do it! Um… I did it [laughs], and it was very nice. I remember showing up to the review and saying, well, “It turned out very good.” Because I spent, like, so much time on it and everyone at the review had totally like, half assed it, and they had succumbed to the glue and the tape and I was, like… “Ok! I did alright then.” And it ended up holding up pretty well, and I didn’t want the reviewers to touch it because I thought that it would break apart. But, then I remember the reviewer handling it, and he was playing with it. I was holding my breath, but it turned out ok.

Judy added that she was also frustrated because of the lack of direction, saying the following:
I remember that he [her professor] was one of those teachers that wanted you to learn on their own, and he was really frustrating for me the first year actually because nobody is ever giving you a direction and actually telling you, “Yeah! This is good! Keep going! Or maybe you should do this.” But, they were just like, “Oh, ok, right!... Ok, go on.” I hadn’t really had a chance to take art classes before and that would be really nice. But it’s like in math, it’s right or wrong, but here: “Well, yeah, ok, that can work, try it out, so…” [imitating the voice of the instructors].

Nevertheless, Judy thought that second year was a relief because she had gotten into the program. But before she could savor that moment of victory, she said had some concerns about the workload:

All of a sudden you were overwhelmed with how much work you were expected to be doing. And I think for my first project, I did, like, the whole thing in one night and then after that I realized that [staying up at night] was not going to work anymore.

Luke also talked about frustrating situations in design studio, particularly being confused about what he wanted to do. He added that how he did in design studio affected all his classes. If he did badly in design studio, this would also assure his bad grade in other classes:

My first semester [of second year] was…my first semester killed me, and I didn’t know what the heck I was doing. Like, my first studio second semester and in all my other classes, I did awful in and I did not care. And then my studio I didn’t even do that great in, because I was like putting all this time into studio and…and it’s just, like, you know, it’s kind of like, “I don’t even know what I’m doing.” My first semester was really tough. And then my second semester, I produced a good project in studio, and then I thought I was alright again. So it [how I felt and how I performed
in other classes] was kind of like, I don’t know, I was always dictated by how I did in studio.

Clare described her feelings of frustration in terms of the pressure that she put on herself; she thought that this was what she needed to do to get into the professional program:

That was so hard for our freshman year. I mean it was definitely intense (repeating what she thought during first year): “I want to get into the program. I have to do a lot of work, and I want to get done in five years. I don’t want to miss out.” I definitely worked harder first year than I did second year. So, after I got into the program I was like, “I’m ok. I got in, so I can slack off a little more.”

Clare also talked about being nervous because she did not know what to expect from second year. In fact, her feelings of fear were confirmed through the interaction with her second-year professor:

Second year was, like, a bad year. The professor I had I think steered me wrong, more that right. And it kind of got embedded in my head that, well, I think I did not understand him, and he did not understand us. I mean the way he taught and explained. ’Cause, first year you don’t know what’s going on, and then you get selected. And then second year we don’t know anything, and I think he thought we knew more. So, he tried to explain what having a design concept is and pulling things together from stuff and relating things to the outside environment and, like, being site specific, and I had no idea what he meant by that. And I remember, like, I went to the site. I got bricks and dirt samples. Our site was downtown Ames, and we were building in that skinny little studio, and it was tough. And they gave you a program, and you had to fit it in this site for some reason. I remember painting them [the
bricks] and stamping them onto paper to make patterns and those were supposedly my plans! I know that that is the year we actually lost the most people. I think we had five dropouts. And I am not sure whether it was the workload, or they decided that they didn’t like it. I know that a lot of people were kind of like me: we were kind of drowning half the…or the whole time, you know, like we don’t know what comes next, but you know, we are going to face it. We had a hard time. Because they tell you what to do but you don’t really understand and then you try to do what they told you to do. I mean, it was frustrating because I remember spending so much time doing something, and he would be like, “No.” “Ok, so now what?!” [I would ask] and then sometimes he would help you and tell you more, but other times he would be like he wanted you to figure it out. But, we were so lost that, it’s just, like, you know, it like handing a 7-year-old the key to your car and saying “Here, drive! Figure it out!” I mean, you don’t know where to start. You don’t have a clue!

Although Michael and Clare had different studio instructors, Michael also felt frustrated about second year with regard to the way the professors instructed.

Well, I guess, I didn’t cope very well my first year [chuckles]… um, I think I was too confident the first year. I thought I was fine and really wasn’t. So the second year, I guess, trying to do things better and spent a lot of time to do things a lot better.

Since Michael did not get into the program the first time around, he took the first-year design studio again, which meant that he was in the newly implemented core program rather than the architectural design studio. He described this studio as being frustrating in terms of its relation to the previous first-year architectural design studio he took:
The second year [of taking the first-year studio], it was actually kind of frustrating because I went into it thinking that it was going to be that again and then more drawing and covering a tool with paper and then cut it up and doing this pattern and then, uh, the montage and then, the box project, and then we did a precedent study at the end. So, then the whole semester I didn’t use anything from that semester in my portfolio except my precedent project. Because I was just a little confused, I guess, from being in the first studio and them teaching you this is what you do in your first year and then going from that, and my professor wasn’t the most in tune with that. He was the new guy. I mean he was good [trying to clarify what she meant] and he helped us a lot with our presentation, which explained the whole theory of why we are doing it [the project], but that [the way he went about it] was not very good so I was frustrated until the end.

When comparing third year and second year, Michael said, “In second year, we were still feeling kind of confused on what we were being taught, I think.”

**Third year: Challenging/frustrating and clarity**

The transitions that the participants talked about occurred as a result of a challenge to their learning. Discovering how to work became an important aspect of how the participants felt about their learning in design studio. Luke described his experience in second year and third year:

I don’t know. My second semester [in third year] I was just like “screw it!” I was like, not liking it at all because in my third year I had bad luck in second studio [second semester], and I always weighted everything on studio and how the year went was how studio went for me. That’s because that was something that I could put work into
and make a product out of, rather than studying and getting grades, things like that. 
And I don’t know whether it was just a bad chemistry between my instructor and me or if, you know, I don’t know [thoughtful and quiet]. And like I feel like I didn’t quite realize what it was really all about, what architecture was really all about, like what I was interested in, and I was really fighting for that I think. And not ‘til…I don’t think that ‘til the end of the first semester of my fourth year and then into my second semester when I went to Rome is when I started to figure out what architecture really meant to me and what I really wanted to do with my education. You know… I think that’s why it was so tough for me. Everything was, like…I was kind of, like, just floating by. I was making decent projects, and I was doing ok. And when it came to third year, I was like, “What the heck?” I don’t know that I want to do this.

A transition in Michael’s education came when he got to third year:

Third year… was… when I got, probably…when I got the most serious about architecture. It was when, I guess, we started leaving the state of Iowa. We started going to Chicago, and did, uh, no, that was second year… and so it was that trip around the Midwest and then just New York [thinking out loud]…yeah. And then it was the first time that we started leaving, I mean, Chicago was not really leaving. It’s just as close to my hometown as it is to Ames; so, um, that is when I started getting serious about architecture, kind of really, and studio was the most important thing… no more having fun… Just, no more being a college student and getting to go out every weekend and usually on Thursday, just having…enjoying doing other stuff besides school. You’re in your other classes, studying. You ate and slept and then you
are in studio the rest of the time. And so, that’s when studio just became everything that…that’s my college education right there.

I also asked Michael whether this was his turning point and he said the following in response:

Maybe not a turning point, as much as a point of clarity. Because, I mean, I was going down a different path. I was still going that way, but that is the time when I finally realized it and got there.

He also continued to talk about clarity in his way of working and his method of approaching things. He had previously stated that he was not sure what his way of working was when he was in the first year and second year, but in third year, especially with all the traveling, he began to understand and apply the way he worked and his method of approaching projects:

I think it was my third year when I realized my way of working, because I never put a whole lot of effort into anything in high school, and tried to put effort in first and second year, but the New York Project clarified things for me. I mean, third year in general…I would say that third year is when people started realizing kind of what they were doing and what they were really interested in and just kind of learning more about like the field in general, why we are doing what we are doing. Everything becomes a little more… real. Stuff becomes a lot less about theory and a lot more about actual projects I guess.

On the other hand, Judy expressed her feelings of frustration with her professor in her third year, first semester:

And then I had [name of the professor] the third year and he was, like, that [not clear about whether you were doing the right thing], and it was impossible to understand what he was talking about, so then that was even more frustrating.
Judy also talked about her second semester and pointed out that her professor in the second semester was a little more understandable and that her experience in the first semester allowed her to understand how she worked by herself:

That was when I figured out how to work for myself. I don’t think that I had learned to do that yet, but then in that studio I figured out how to kind of get into the swing of things, how to do this whole studio thing. It took me until third year to learn how to do that but… at least it wasn’t fifth year.

Monica described third year as the year that molded her. She said, “because, my professor in third year and he got us thinking about sustainability and what that means, and that studio started defining me as a designer.” So, the way Monica thought about design was attributed to her third year.

**Fourth year: Clarity/Transitional**

In this fourth year, Michael determined how to approach projects and made the transition to actually applying concepts that he had learned in his projects:

Well, I think that that was a big thing that I figured out last year, through the Montreal project, which was, I mean, is, pretty much putting everything together that we learned second year and third year in one project. So that, like, helped me figure out exactly how I do things…and how…and what I like to get across doing certain things. Last semester in Rome, being able to kind of start to maybe find my confidence in doing my own thing and doing that on my own was why I knew that we could do this, the project [independent project].

Luke also spoke enthusiastically about Rome. He said, “Rome…my experience in Rome, it changed my perspective on my view about architecture, about life, the way I view life; it just
opened my eyes about what’s out there.” Luke’s story was intriguing because several themes were uncovered through his explanation of how he came to a point of clarity and transition:

So, I mean, that was really… second semester of my fourth year was just a big turning point for me, and it took me so long to just figure it out… you know. I mean, some people just had it right away. I was like “What is my deal? Why can’t I [pauses in frustration], what is wrong with me? I cannot figure this out here!” I’m not saying that I have figured it out either yet.

After two years of not understanding what she had done in her second year first semester, Clare described the transition that she made in terms of understanding why the professor made her do markings on paper to create a plan:

Remember when I said that [mentions her professor’s name] led me off track and he kept talking about diagramming, and I wasn’t understanding what diagramming was. So, with [mentions name again] I felt like when I stamped this thing, that was supposed to be my floor or something. And when you have this line of buildings and you connect the lines, and you have this tangled mess, that was supposed to be an example of my circulation. Somehow I got that stuck in my mind, and I really didn’t understand that that was diagramming. And then finally last semester, when I had [mentions her fourth year first semester professor], he had me diagram stuff, like things like what happened at times during the day in the open air market [the project that she was working on at the time], like the interactions of people. Well, I slowly began to understand that that diagram is not supposed to be my floor plan, because it doesn’t look like it! So, then I illustrated that at noon, this is what’s going on here, so then how do I design around that, and there’s a market going on… but that diagram
was not the sidewalk pattern. And so at noon in my center space, how do I design for it? So, finally, that’s when it clicked, that’s what it meant—an illustration!

**Summary of Transitions**

In summary, three main themes were uncovered during data analysis. The first was that participants experienced a linear but overlapping progression in their learning experiences. For example, within their first and second years, participants perceived that their learning experiences were confusing and frustrating, and when they got to third year, they still had some feelings of frustration, but they also moved toward understanding and clarity. Transitions from year to year were illustrated in phrases, such as “It clicked,” “point of clarity,” “I realized,” “I got the most serious,” and “I started to figure out” that show a move from confusion to understanding, from cloudiness to clarity, from unawareness to realization, and from being flippant to being serious.

The most interesting overlap of learning experiences between the years was that which occurred in the participants’ first and second years. This overlap was interesting because of the literature that is available about first-year student experiences and their transitions to their second year. For example, Powers (2006) interviewed several leaders in prominent universities on the topic of the second-year student. She found that usually first-year students are targeted as students in need, but by students’ second year, the student-services initiatives cease to exist. A good example of this type of initiative is the learning community, which typically includes—and assists—only first-year student. However, the participants in this study voiced that their second year was confusing and filled with frustration because of the assumption that the students knew what they were doing. The data gathered could be a stepping stone to determine what the second-year student needs in the
design studio academically and to design student-assistance programs based on those needs. So, rather than “drowning” as one participant described the feeling, second-year students would have an intentional support system that helped students “swim.”

The question that guided this domain was, how do particular architecture students in a fifth-year studio perceive their past learning experiences? The domain that emerged was transitions, and the categories were, 1) confusing/frustrating that occurred in the first year and second years, 2) frustrating/clarity that occurred in the second year and third years, and 3) clarity/transition that occurred in the fourth year.

In the next section I discuss the third domain—experiential outcomes

Experiential Outcomes

Although the outcomes of learning experiences in the participants design studios can be physical and social, this study leaned toward understanding the social outcomes of learning experiences. The themes that emerged under this domain included the collective process, learning through critical reflection, the creation of a vision, and honing a way of working.

The collective process

The participants had been applying theories, concepts, or lessons learned to their design studios in their previous years as the years went by. For instance, Michael described what he had learned in the previous year and how he was applying these ideas to his work:

First year to second year is just really applying techniques of drawing and building techniques, of just the actual physical side of the…what you put together and not only what you put into it. And then you start learning some theory in second year and that carries over to third year, and then, you start getting the more real side of the teaching
more, um, code issues. And you start to figure out and I would say that you start to develop your own style and knowing what you are starting to like and what you are starting not liking because you are beginning to see what is out there. And then your fourth year you are kind of testing yourself… so that you make sure that you know everything. And then fifth year is… [thinks] whatever… [laughs]. I think that it is all just a collective process from start to finish. Um, I would think that what you learned in first year I don’t see as important because it is almost second nature now. And all that stuff that we learned right away is considered as second nature to us, and we do it without thinking about it. And the stuff that we are learning now is what we have to focus on to be successful.

He also described the collective process in this way:

I think it starts off as one broad idea and then, kind of, works its way down into more finite parts or aspects of architecture. From the broad theory base and it works itself down to details and the smaller parts of the project that people don’t really see. But it [the details] is the most important part; that’s where you spend the most time on. I think it is very much a discovery process in that, um, I mean when I went into architecture I had these kind of broad ideas about what I would be doing and basically coming from what I have seen or what I see in building before I came here and then. You’re taught this kind of broad view and every year you learn a little bit more of what actually goes into it and then you realize that the broad ideas… not very much time goes into it, often. I, well, you know we kind of did … it’s not really about trial and error because you only try something once and then it’s an error… so it’s like you don’t get to try it again, unless you go back and redo a project, which no one has time
to do that. But, I think it’s more just a, yeah, trial and error is a way of saying it, but you don’t have time to try it again. I guess you have to learn and discover how to reuse those ideas in a certain way for the next project even.

In addition, Clare gave an example using what she had learned to inform what she was doing now:

I will do it in sketch up because it is easier, um, you know, and you have templates of things that you design for and you can cut and paste over the next file. Especially for this design competition, I’ve been using a lot of things from like previous semesters and like building chunks and putting them together and seeing how they work.

Monica also explained how she used her fourth year project to inform how she went about designing her fifth year project.

**Learning through critical reflection**

Education scholars define critical reflection as the ability to analyze situations and circumstances in one’s experience, and put action toward a change or application of a learned lesson. The participants in this study were able to critically reflect throughout their first-through fourth-year learning experiences and make changes or apply a lesson learned based on their experiences.

Although Michael was frustrated with the way his third year professor taught, he looked back at it and suggested that he gained valuable experience:

Um, I did…I understood everything except one semester third year with um [thinking] [says the professors name]. It was this one semester where we were all looking forward to a certain project. And then we did something totally different, involving like sustainability and all that and, like, and none of us had really heard
about that yet and so we were just upset with the whole thing because we did not get
to do the project that we wanted. And I was like “this is stupid.” And then, when I
look back at it, it was one of the best projects that I have ever had. And if I had
known that now or if I had done that now, now I could have done something pretty
cool with it.

Similar to Michael, Monica’s first semester project in third year was one she could have
reworked if she had the knowledge:

Third year at times I felt like I was stuck with [mentions professor’s name] and we’d
focus so much on research that by the end of the semester, like two weeks before the
end, we had to come up with a design. So, all in all, I think that that project was the
most well thought out, but the design definitely was lacking. And if I were to do any
one over, I would do the design for that.

Michael also talked about the idea that an architecture student was never done with his or her
work regardless of the deadline. There was always something to do and refine. He reiterated
that continuation on a project that was “finished” was not an option either. Rather than
continuing with a project, students had to take what they learned and apply those lessons to
the next project and not make the same mistakes twice. By learning what Michael did in
projects, he realized that the quality of work was more important than the quantity:

In studio, everything was all about how good you did the task and, um, if you had
something else to do and there is always more that you could do to make your project
better. But it’s not stuff that you needed to do, but I guess you kind of felt that
quantity and quality… I think I have gotten over the quantity thing. Back then, I
didn’t know the best way to present my ideas, and now that you do know that you
don’t have to do everything. A floor plan is not going to tell them [reviewers, clients] anything. There is no sense in having a beautiful floor plan up there, other than the fact that it is a beautiful. I guess it’s accepting the fact that you don’t have to do everything.

By reflecting on the learning that had occurred in the previous years, Michael explained how it was important to know where they came from in order to inform their work on future projects.

Moreover, when Michael thought about his future, he was able to articulate and reason through why he was in the architecture field and how he might be better off than some of his friends who graduated before him in other fields:

Uh, there is one thing that is kind of strange…is that how we always complain about how much work we are supposed to do in studio and how much we think we do and compared to the other people on campus and how we all think that they do not realize how much work we put into it. It’s like, “Why would we do that?” I think that everybody just enjoys what we are doing and my friends who have gotten a job after graduating earlier just hate what they are doing. And I think, as far as I know, that there are some people who are not going to go into architecture. They are going to go into something else, or something similar, but everybody kind of likes it. Another strange thing…I think that we are amongst the poorest people amongst the prestigious jobs. We have the high want for the high lifestyle, taste, and everything, and we can’t afford anything. Everything is just, well, it makes us be more creative about using our money and getting something out of nothing, I guess. It would be too easy if we got paid enough.
Thinking about the future was also important for Luke:

I think that’s kind of what this semester has been for me. Um, like really thinking about... over this summer working down in Kansas City... to spend all of these years in preparation for... for what? I want to do something good right now... you know? Instead of doing some hypothetical project, that, like, I mean I think that’s what so tough for me, is that, uh, you don’t produce anything out of it and, uh, nothing, uh, and this whole summer it’s like I was kind of thinking that I want to do something. I want to... While I’m here I might as well not wait for another year to start. What I wanted to do [in the future] and that is why I am taking the classes that I am now and that’s why the focus that I am looking at in studio is about that.

Luke also reflected on his fourth-year, first-semester experiences. He remembered how much work he put into the projects and came to a conclusion that the lifestyle that was only architecture focused was not the lifestyle for him. Luke described his experience in this way:

It [fourth year first semester design studio] was a whirlwind. And we just... my partner and I just put in hours on that project and we saw great results from it. Like, me and my friends’ projects were selected for a competition. We didn’t win it or anything, but we thought that it was quite a privilege to be part of it... I mean I didn’t like it at all... I was like I am putting so much work into this, and I am not having fun at all. Like, the fun is just sucked out of it when you are putting so many hours into it that. You know, it’s like, you know, I was living with all my roommates that I had been living with my freshman year, and none of them are architecture students. Of course so it’s like a totally different lifestyle, and I am missing out on all of this stuff and, like, I don’t even like doing this, you know... We produced a good project out of it,
but I was still, like, didn’t have fun at all. Obviously, the technical aspect of everything, I really got into all that… but architecture as a whole, some people go through their careers, just work an ungodly amount of hours. And that’s not me at all. I would rather be home with my family and… I want to do great work but I guess if it is going to be at the cost of my family life, then, I guess I don’t care. And, so I guess, this is one thing that I pulled from the first semester [of fourth year]. It just pulled me away from so many things that were important to me. Like I didn’t even have time to read my bible any more, and I was like, “Wow, this stinks.” I don’t know, it’s like this is not worth it to me, you know.

While not as significant as Luke’s reflections on the architecture lifestyle, Judy also gave an example of what she learned from her experiences in completing projects:

So, I used to just sit there and focus and slowly it would become morning, but I don’t have the energy to do that anymore. I am a night person, but not when I have to get up the next day.

So, Judy had made a conscious decision to not stay up at night because it would affect her energy level.

Another illustration of critical reflection was evident in Clare’s story about her first year experience and how it has affected her:

In the first year I remember [mentioned professor’s name], and I am so thankful I had her. She just opened up your mind as to… just the concept and pulling different things and thinking differently. And the, I mean, first we had the precedent project, then we had to pull three elements from that and had to design our own building. And I remember I was kind of struggling with the door. I didn’t know how to do the door.
Because in my mind...like in first year you are so concrete, you have to build the
door and it has to be rectangle. And she was like, “Why? Why does it have to be?”
And it doesn’t have to be. And I remember I ended up having some cove that people
can slip into and it really made my whole project come together, but it wasn’t until
she asked me why I had to have a rectangle as a door with hinges on the side. And I
was like, “I don’t know.” Because that was the only door that I ever knew, and in
your mind you are so stuck in your ways and so whenever I get stuck on something I
kind of, like use that. I would just ask myself, “Why? Why does it have to be that
way?” And usually it doesn’t have to be that way. You just feel like it does. But I
think she definitely opened my eyes to design.

At the time of the interview, Clare said that she still used the strategy of asking “why” to
help her in the process of her project. She also reflected on how presenting work to a client
can be likened to presenting work to her classmates, reviewers, and professors:

Probably...I think a big part of it is just expressing yourself, and getting your ideas
across is the hardest thing to learn. But most probably the most important thing...
because, you know, even in the work world if you can’t explain to your client what
you are trying to do so that they understand what you are doing, you are not going to
get anywhere. And it is the same thing when you are with your professor, and you are
trying to explain your crazy madness and they are not getting it. Then, it’s a waste.
So, I think more with images, I think, with my explanations, like, rather than just
pinning up the floor plans and the sections, you know. I’ll have my diagramming and
the charts that I have been working off of... and even just the stupid pictures that you
think doesn’t really matter. And they can see the picture and they say “oh.” Like right
now I am doing a multi-family housing and combining…I would have an image of the grandma and the family and then how they interact and how the buildings interact. And just having pictures helps them to say that that’s the mother-in-law’s apartment.

Last semester in my fourth year, that’s when I actually learned that. He [the professor] had us do this, because for the design competition board you don’t get to explain and so you have to put a picture there to explain like with arrows and stuff. And once I started I got more comfortable in actually doing that, and then people understand what I am trying to do a lot better.

**Creation of a vision**

When the participants were asked how they thought that design studios affected them, not only did they have a vision for their lives, but they also had a vision for affecting people positively. All of the participants were interested in the idea of sustainability and some of them attributed it to their third year in architecture when they were forced to think about the issue.

Michael explained that sustainability was a big factor when choosing a firm after he graduated:

Well, I am heading down to Kansas City, right when I graduate, and definitely focusing on… I mean, sustainability is a huge thing now, and the firm that I am going to work for is going to have to have, high…I mean big ideas about sustainability and incorporating that into everything they do. And as far as maybe after I get licensed, maybe either working for another firm, or the idea of having my own firm…I think that it will be fun to have my own firm.
Michael also talked about his idea of being able to do something good for people in terms of his career and the goals that he has for the future:

I think it would be being able to look back and being able to show what I did in my career. Being proud of what I accomplished. I mean just knowing that I had the chance of doing something good for people, but that sounds corny. Now we have the opportunity to change stuff. I’m not sure about the opportunities, but the idea of having an opportunity to change stuff it pretty intriguing.

Because of Luke’s trip to Rome, he was able to think through what he was interested in and how those interests came about. His story illustrates creation of a vision, a concept under the second domain in the fourth-year category. After telling his story, Luke talks about his vision and what he would like to do in the future to affect people’s lives:

Well, I went out and found a lumber yard and bought the wood I needed and we had two tools in our woodshop downstairs. So I just worked with what I had, and it was so much fun just because I like to produce things, you know, and that’s what I love to do. And my whole semester was just go down to the woodshop and start making this thing, and I had a blast doing this. And, I guess, that’s what studio is all about. But that really got me thinking about the things that I am really passionate about in architecture. I guess, being in Europe as a whole, just kind of really…[Being thoughtful], I engulfed myself in the culture, just submerging ourselves in the…and that’s what they [the professors] really wanted us to do—just getting into the culture there. So, that got me thinking about not looking at architecture as a building but looking at how it affects people. But in a broader range, and the kind of the systems
we use for that. Not just as a building, but how the buildings affect the quality of light… that kind of thing.

While some participants, like Luke, created their vision of architecture late in their studies, Clare’s vision of being an architect started when she was a child:

Probably, being stubborn [laughs]… I really think that, like, back in sixth grade, I was, like, I announced to everyone that I was going to become an architect…and I told everybody that, and I just had it set in my mind that that was what I was going to do. And times I think, I don’t know, like, now I am over that, but there have been times when I think in my five years here, well, “What if I did something else?” Even just, like, graphic design. I think it is really interesting…and so…and web design. And I know that I can do something design based, but sometimes I wish I would have opened the door a little more and entertained a few more possibilities. But I say, “I am going to be an architect, damn it! Because I told everyone I was going to do it so I am going to do it.” [laughs].

Although Monica had complained about third year, she said that that was the year that affected her the most. She was confident in the fact that she wanted to take sustainability into account when designing and that sustainability was her ultimate goal:

So, a lot of my projects from then on kind of take the sustainable/green aspect. And the reason why I question whether I am in the right field [I’m sure I am] is because developers… I just don’t like how they are always trying to make money and not really trying to look at the big picture. In the long run and a designer is willing to manipulate that a little bit. But I just think the United States in general has taken a turn for the worst in terms of green issues. So, just helping us to get back on that
[sustainable architecture] route. So, I would like to get into a smaller firm that kind of focuses on sustainability aspects in design. It doesn’t really matter what type of projects, and for me it’s much more than that. But I think that for me, in general, I need to be in a firm that I am passionate about what they are doing. If I am not passionate about it, then forget it. And that’s [being dispassionate] going to be the challenge.

Judy also knew what her interests were for the future:

I am interested in housing I guess. I guess buildings affect people’s lives, but I guess housing is like, everyday, kind of. Mainly residential housing…and maybe multifamily housing rather, because the other won’t get you any money. But, I mean, that’s what I am interested in.

Judy also considered the condition of housing in the United States and came to the conclusion that she wanted to be in an environment that encouraged the design of buildings to last and not to be torn down:

I would like to get licensed and, ultimately, I don’t want to work in the U.S. I would like to work in Britain or Ireland or Canada, because I was always fascinated with them…I always watched the Saturday night PBS shows [laughs], and my family would always make fun of me. But…so, not last summer but the summer before I was like, “I gotta go to visit there.” I had never been there. So, I went with my mom to London for a week, and then we went to Rome last semester. And then after that I went to Ireland, and I thought that Ireland was even better. So, I don’t know, I would just like to do that. And also with architecture, they have it so bad in the U.S. because the average building here lasts around 35 years, but the buildings in those areas
[London, Rome, and Ireland] are built to last, and they have to design it so that it’s going to be useable for all that time. It feels like a better place to do architecture. So I’d like to do that. So, I don’t know, I have not decided yet if I want to do architecture here and get licensed here and go over there, or if I want to go there and do it.

In summary, the participants in this study said they knew what they wanted to do in the future, and what they wanted to do in the future was determined, in part, because of the learning experiences that they had in their design studios.

**Honing a way of working**

An example of Judy honing a way of working started in her first year where she said that she did not know then what her way of working was. She then began to realize how she worked and used that to her advantage. Coming from high school, she described her experience in design studio as “weird”:

Well, it was new to me because I had taken art classes before but we never really had any long projects, and so I found that time management was a really big thing for me. “Oh well, I have this one thing to do and it’s going to take forever!” and that’s how I felt. It was strange to have studio take up such a large amount of time, but you don’t see the result of it for another long amount of time. And so it [the studio] was kind of weird to be so open, even though they gave us deadline. So, I was used to having to do my homework for class, like, everyday. But in studio you do not get something done in a month and that was weird. I also found that I am easily distracted, I guess, and that helps me, like, focus more on production. I really actually think too much and produce a little. I always, like, run through all the changes that I want to make in my head and then I pick the one that is actually going to work. And then after that I
always produce lower quality little process things on the way and then the final one … I think through everything in my head before I start actually laying anything out on paper and doing anything. ‘Cause, I mean, like with math and science and stuff, I have always done it in my head first and then thought through it. And knowing that this is going to end up in a certain way and then doing work for it but… yeah, I don’t think I really knew how I did things until I got here. I think I realized pretty early on that I manage my stuff pretty well— in about third year.

Judy also described that she mastered the art of accomplishing her work in the time period that she sets for herself, and that the strategy had been very useful. She explained that she used to do several all-nighters and wait until the last minute to finish things but found that with a more structured schedule, she works better and produces better projects.

Unlike the other participants, Luke was the only one who knew what his way of working was before he came into college and carried on that way of working. He stated, “I learn by going out there and doing it.” Luke was very passionate when he described his learning experience in Rome, and one of his stories exhibited several ways that he experienced learning, including self-drive and interdependency. His story also uncovered the outcomes of his experience, including a way of working, self-confidence, and critical reflection. He describes his way of working in this regard:

As far as studio [in Rome] goes, I really honed in on innovation and that’s what I’m really interested in, being innovative and thinking of new ideas and doing new things that no one has ever done before, just, like, reinventing, and that’s my passion. Seeing some of the buildings there, like especially in the forum, especially the buildings that are still standing even though it is only a third of it is still there. Like the Basilica of
Constantine, it was so cool to me. People were even afraid to inhabit the structure when it was first built because they had never seen a structure like that before. It was, like, I would just sit there and like listen to music or draw, and, like, take everything. [Pauses.] It was just so awesome.

Not only did the environment in Rome play a role in his transformation, but his instructor also contributed.

Quite unusually, Clare realized her way of working early on during her first year design studio. She explained that she was highly organized and that she would actually stop doing any sort of schoolwork after 9:00 p.m., except for a few times when she had to stay up until 2:00 a.m.:

It really did not work with the group. Oh, not well at all. I hate group projects. I’ve always hated group projects. My roommate and I, we were talking about that the other day because we are in an independent studio, and I think that is the real reason why I chose the independent studio, so that I can do my own thing at my own hours. Like, I’m a morning person, so I like to do things early in the morning, so I get up early, which means that I get tired early and go to sleep early. I’ve really never been like a big partier, drinker, like going out late on Thursday night and Friday nights. So, I don’t know, I kind of like to, I don’t know, I don’t keep to myself, but I like to do my own work and my own stuff, on my terms and my hours, so group projects and I, we never got along. I mean I wanted to be done by 8 o’clock, but they [the team members] say, “Let’s start at 8 o’clock.” So…so, I have actually have never done an all-nighter. I guess I’ve always been organized…every time when I was a little kid and I came back from school my Mom would say, “Ok, do your homework before
you eat dinner.” So, I mean that’s how I am. I go home and I do my homework right away. And, you know, I probably still have to do it after dinner, but usually by 9 o’clock I stop. I mean I start getting burned out. So, everything that I do after 9 o’clock is pretty worthless anyway so I might as well stop. But, I have stayed up late before, and 2 o’clock is pretty much the latest I can remember. So, I remember doing that and ended up saying that I am not doing that again, and I was building a model and I put something on backward and then something didn’t line up and I was like, “Four hours wasted! I could have gone to bed.” And I will get up early and work all day Saturday and in between classes, but I will stop and watch my shows at 9 p.m. and then at 10 get ready for bed. I get up early the next day.

Clare also elaborated on her way of working by describing her work place. She attributed some of the actions that occurred in her workplace, such as procrastination and all-nighters, to what actually occurred in the studio. Although these attributes are what she perceived to be the norm, Clare said that poor time mismanagement was one of her pet peeves. She also added that her way of working in first year was not affected by the first-year studio because she was used to trying things over and over again as was the way it was done in studio. Nevertheless, she explained that her way of working evolved. Instead of doing things differently, she said that she “found as many possible short cuts” as she could and never built anything that she doesn’t need to.

Monica also described her way of working, not only in groups, but also individually. She did not know how she worked until she started interacting with people in studio. She explained her way of working in the following:
I would say that, like most designers, that I am a visual learner, and I would need everything laid out in front of me and the classes that require test-taking, I don’t do so well in. I’m just, like…I over analyze. I over think everything, and then I just end up hurting myself more on them. But in general, I have come to find that the design classes…I find them much easier than taking like a business class. So, since I am more visual, if you show it [how to do something] to me once, like, [snaps fingers]. I have got it. If you tell me, I do listen, but I sometimes…I only pick up on a few of the things that might mess me up. But if you show me how exactly it should be done, I’ve got it. In second year when I worked in a group, I think I was the one who said, “We should do this” and “Let’s crank it out,” and we did it. And then third year, I was kind of tired of being that person, and so I said, “Let someone else be the leader” and “Tell me what to do and I will do it.” And then there was another studio where I just showed up to get stuff done. Well, I think that I contributed my part more than most, but I would say that I wasn’t always the one doing it all. I am definitely a team leader. I will always contribute, but sometimes backing off is better.

**Summary of Experiential Outcomes**

The outcomes domain included the collective process, learning through critical reflection, the creation of a vision, and honing a way of working.

Students were able to point out the result of their learning experiences. In this study constructivism and social constructivism became theories that helped understand these learning experience outcomes. An example of this understanding is seen when Michael talked about the collective process. He said that the new things that students learn are their focus. In the mean time, they had a database of information that they already drew on to help
accomplish their tasks. The theory of constructivism rests on the tenant that knowledge is built upon (Dewey, 1938; Fosnot, 1996; Howe & Berv, 2000; von Glasersfeld, 1996, 2000). Learning through critical reflection can also be interpreted through the eyes of constructivism, because to reflect critically, one needs to be able to look at what they know and reason through that knowledge. Through this reasoning, participants were then able to think about how the work that they learned in their design studio could be applied to current situations and also future situations when they started working after graduation (in their words, a creation of a vision).

As part of the outcomes of their learning experiences, some of the participants talked about the “all-nighter,” which the AIAS Studio Culture Task Force (2002) mentioned under one aspect, *unhealthy student health and work habits*. The Task Force emphasized this habit as a negative aspect, but students did not seem to focus on its negative outcomes. Rather, they discussed what they learned from the all-nighter and how they used the all-nighter to their advantage. Instead of staying up and not getting work done, they actually did get work done, which is described by Monica as a true all-nighter. Also, Clare learned from her all-nighters- they helped her define her way of working. The participants, therefore, perceived the all-nighter as a way to complete work or as part of their learning process in understanding who they were.

The question that this section answered was, “What are the outcomes of their learning experiences?” The domain was *experiential outcomes* and the categories were, 1) the collective process, 2) learning through critical reflection, 3) creation of a vision, and 4) honing a way of working.

The next section summarizes the domains and categories.
Summary of Domains and Categories

This section provides a summary of the findings that were presented. Its organization was based on the three domains that were uncovered during data analysis: interrelation, transition, and outcomes. Each domain aided in answering the research questions posed.

Learning Experiences: Interrelational

Participants in this study described their learning experiences as interrelational. The different areas of being interrelational included being self-driven and interdependent.

The participants experienced learning as being self-driven, where they felt they were forced to make decisions on how to work and what to do to accomplish a project. This self drive came about from their point of view because of the lack of guidance from the instructors, and that type of experience of learning was mainly in the first three years of their design studios. In the upper-level studios, participants experienced learning as an opportunity purposely given by the instructor, allowing them to have more of a say of what the projects would look like and how they would approach the problem. Participants were, therefore, did not feel forced to be self-driven at this stage; instead they felt they were given the opportunity to be self-driven.

The second way that the participants described their learning experiences was in their reliance on their peers and instructors for guidance, critique, working techniques, and creation of an environment that was conducive to working. The participants relied on their peers more than they relied on their instructors because they communicated more and had more contact with their peers. The prevalent peer-to-peer interaction meant that students were able to help each other in a variety of ways, such as emotionally, socially, and academically. Help from professors was limited to the academic sense.
**Progression in the Experience of Learning: Transition**

This domain included the participants’ thoughts and feelings about the learning experiences in design studio, and participants’ perceptions were grounded on the experiences that the participants had according to the year that they were in. The categories that emerged under the domains included thoughts and feelings of confusion and frustration in the first and second years, frustration and clarity in the third year, and clarity and transition in the fourth year.

Because of the lack of knowledge about project requirements and assignments and the student perceptions of the lack of direction from the instructors, the participants felt that first and second year were filled with confusion and frustration. Students also lacked knowledge about each other, which may have caused group combinations that were not project oriented but oriented towards how well the students knew each other. Participants were also frustrated about understanding the project and the reason for being told to approach a project in a certain way. Frustrations also stemmed from the fact that some of the design-studio professors were not clear about their expectations of the participants.

In third year, frustrations resulted from professors’ teaching styles, and from participants’ questions about putting themselves through a challenging program. Despite these frustrations, all the participants pointed out that the third-year was also a year of clarity, where project requirements, teaching styles, and techniques became clear to them. Third year was a year of realizations about the meaning of projects and about the reasons for approaches to a project. From some participants, third year was a year when “things just clicked,” as Judy said.
Fourth year was a transitional year because students seemed to find their niche. Students were making decisions on their own on whether they wanted to work independently, whether they could actually do a project, and how they were going to approach it. Most of this transitional period occurred in the second semester of fourth year, regardless of whether students went to Rome or stayed in Ames. During this time, participants’ projects became more meaningful to them, and they were proud of what they had learned about themselves and the work that they accomplished.

The Outcomes and Incorporation of Learning Experiences

Students described four major impacts of their learning experiences: (a) the collective process, (b) learning through critical reflection, (c) creation of a vision for their lives, and (d) honing of their way of working. The participants reflected on the cumulative process of design, which requires one to learn through critical reflection of their design work and that one become more aware of his or her way of working. Participants also further reflected on how their learning experiences in the design studio had helped them develop a vision for their future.

The first area that was discussed was the understanding of the participants’ cumulative understanding of their learning experiences, where the information that they learned each semester was pertinent to the next semester. This cumulative process encouraged students to document and think about what and why they did what they did every semester. Second, participants also discussed how they thought about their lives and the processes that they have gone through in the architecture program. They were able to critically reflect on projects, instructors, themselves, and their attitudes, depending on the year. Furthermore, the participants understood the importance of looking back, thinking
about new ways of doing things, and reflecting on how they could have improved on a particular project. They used their reflective skills to help mold their current projects, and most of them said that they would continue to do so.

Third, when students talked about their learning experiences in their design studios, they came to the conclusion that the studios had helped them think about what they wanted to do in the future. Their reported future aspirations included working in firms, the desire to have families, and the clarity of focusing on an issue that was pertinent to their lives, such as sustainability. Participants were also very detailed in their description of their expectations for the firms that they wanted to work in, in terms of size and experience. Indeed, participants’ learning experiences had made them more focused on a vision for life, conscious about changing or affecting other peoples’ lives, and determined to use the skills that they had learned.

Last, the fourth area of emphasis was participants’ way of working. The students talked about their way of working and how that advanced as the years went by. Particularly, the participants who were not sure about how they worked or approached projects when they entered the program were now confident in their way of working, which ranged from linear, last minute, to very ordered. Participants’ learning experiences also allowed them to create a preferred method of presentation, and they were able to intentionally choose what they needed or didn’t need to make a project convincing to a client.
CHAPTER 5

DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, REFLECTION

In Chapter 4, I presented the findings and summarized the analysis of the findings. My findings drawn from the data structured the student’s perceptions of their learning experiences into domains—interrelations, transitions, and outcomes—and within these domains, themes emerged. I then summarized the chapter, listing the domains and the themes and giving a brief synopsis of each.

In the next section, I discuss the findings and how they relate to the relevant literature, including learning, student development, and architectural design studio pedagogy. I first discuss the themes under each domain, referring to the literature that was deemed relevant in Chapter 2. This literature included readings on learning, student development, learning environments, and the architectural design studio culture and pedagogy. Second, I communicate the implications of this study in light of the discussion. Third, I recommend suggestions for further research. Thereafter, I discuss each research question in light of the analysis. Finally, I reflect on the process that it took for me to accomplish this research, the relevance that it has in my life, and what I would like to pursue, in light of this research, in the future.

Discussion

A visual representation of students’ interrelational learning experiences in the architectural design studio is shown in Figure 2. Each student, according to the findings, has certain learning experiences that play a crucial role in the outcomes of his or her learning. The rings represented are the interrelational learning experiences that were found in this research. This is not to say that these are the only interrelational learning experiences that
students have in this setting, but the figure is a representation of what was observed in this study.

Figure 2. Interrelational learning experiences students had in the architectural design studio.

If all the students started first year and were accepted into the program in the same year, their interrelations—when the participants began to interact in their first-year design studio—highly influenced one another, according to the findings (see Figure 3). In this study, some of the participants did not interact with the same people in their first-year design studio experience because they were accepted into the program one year later than anticipated. But they still were able to relate to one another in terms of learning experiences and influence one another through their interaction. The web of learning experiences indicates how students have moved through their first-, second-, third-, and fourth-year design studio transitions and, along the way, benefit from outcomes of their learning experiences. Even though individuals interacted less with each other in their design studios as they transitioned from first year to fourth year, some students perceived that they were still influenced by each other as they transitioned from year to year, and they also had similar outcomes. In this study, the
Figure 3. Web of learning experiences.
outcomes of the participants’ design studio learning experiences were similar, but I anticipate
that there were more outcomes that may not have been discussed. Thus, the arrows point
outward in the figure to illustrate this possibility. Figure 3 also shows how each individual
fits into the big picture of interrelational learning experiences, transitions through their
studios from year to year, and outcomes of their learning experiences.

**Interrelations**

Chickering (1969), Silverman and Casazza (2000), Huba and Freed (2000), Evans,
Forney, and Guido-DiBrito (1998), and Strange and Banning (2001) all have acknowledged
that during their college lives students are affected positively and/or negatively by their
environment. Furthermore, these researchers suggest that the student services in their
learning environments, whether on campus or in the classroom, can enhance students’
learning and development. Some of the learning experiences that the participants in this study
described support the student services concept. This was particularly true regarding the social
environment, which I have labeled interrelation. Interrelations included one-to-one instructor
interaction, team- or group-work, collaborations, and peer-to-peer interaction. All these types
of interaction are considered a part of the learning environment, although interactions are not
a physical part of the environment. Under interrelations, self-driven learning experiences,
interdependent learning experiences, and social learning experiences are evident.

**Self-driven Learning Experiences**

Students are perceived by instructors as knowledgeable in design when they first
participate in the design studio (Schön, 1987). The findings showed that the students
perceived that they were expected to be responsible for their own work and to determine
what they needed to learn to succeed in the design studio. Self-driven learning reflects a
constructivist mindset where individuals are active constructors of knowledge (Derry, 1999; McMahon, 1997; Vygotsky, 1978).

However, some of the participants stated that they were not told what to do and did not receive sufficient guidance on how to design. One participant was upfront about this issue and perceived that the lack of direction was a fault of the instructor rather than a purposeful learning pedagogy designed to help students learn. While the instructor may have had some room for improvement, the outcome of these self-driven design studios was a more versatile designer. The perceived lack of direction and lack of knowledge provided to students forced them to seek out needed information, often from peers. One can see this peer-to-peer teaching and learning process as aiding in the social construction of an understanding of a design studio and the architecture education culture as students begin to interact with other individuals to help make sense of not only their design (Derry, 1999; McMahon, 1997), but their view of the culture of the design studio. In the constructionist mindset, individuals are not only active constructors of knowledge but they are also makers of constructions that are external and shareable with other individuals in a learning environment (Burr, 1998; Hibberd, 2005; Papert, 1980, 1990; Shaw, 1995; Turner, 1998).

If the students’ design studio experiences are looked at through the lens of Chickering and Reisser’s theory of student development, the vector, managing emotions, helps interpret how participants’ handle their frustrations emotionally (Reisser, 1995). This appropriately implies that students have already experienced the third area of focus, interpersonal competence, under the first vector, developing competence, because of their interaction with others in the design studio. Experiencing interpersonal competence, therefore, led to managing emotions. Consequently, this cause and effect scenario allowed participants in the
environment to spiral into the second vector (managing emotions) and, at the same time, handle issues concerned with the third and fourth vectors: moving through autonomy towards interdependence and developing mature interpersonal relationships. The last three vectors mentioned would then be interconnected and occur simultaneously just as Chickering and Reisser (1993) suggested: “a spiral is a way to visualize the vectors, rather than a straight line” (p. 8).

In conclusion, self-driven learning experiences in the architecture design studio can be confusing to students, especially in their early years of learning (Yanar, 2001). Also, studies in the architecture design studio examining learning styles have shown that design studio students tend to have a wide range of learning styles that affect the way that they succeed in their design studios (Demibras & Demirkan, 2003; Jia & Kvan, 2004; Kvan & Yunyan, 2005). Demibras and Demirkan found that students who were accommodators were less successful than convergers when they first started interacting in architectural design studio learning environment. Nevertheless, as students progressed through their design studios, they showed a wider range of learning styles and also were more successful.

This inquiry shows that students move from confusion to clarity, even in their self-dependency. And if this is so, students in their architectural design studios, in this study, may have been pushed outside their shells into developing more well-rounded skills and learning styles. This is not to say that all students in the architectural design studio have a similar learning style and that students that are more inclined to one learning style than others are more successful; rather, the results suggest design studio has the potential to be a catalyst for enhancing student learning and development, leading to even more complex learning
experiences. The self-driven learning experience, therefore, leads to interdependent learning experiences.

**Interdependency**

Regardless of the participants’ experiences individually, they spoke a great deal about their learning experiences in groups and between individuals. They also realized and reflected on the learning that occurred in those types of situations. Needless to say, several scholars have acknowledged the power of collaboration and group work with regard to a learner-centered, problem-based, and constructivist learning environment (Jonassen, 1994; Reeves, 1992; Weimer, 2002; Wilson, 1996). This is not say, however, that groups are the primary form of collaboration in design studio, because students collaborate informally when they are working individually.

With regard to group dynamics in design studio, problems had to be resolved between peers. Very early on in their education, the participants had to learn how to get along with peers, get to know peers, and were required to work together to produce results. In learner-centered, problem-based, and constructivist learning environments, interactions within groups and between individuals is very important (Jonassen, 1994; Reeves, 1992; Weimer, 2002; Wilson, 1996). In the design studio environment that was described by the participants, the students were given opportunities to work in groups at certain times during the semester. Even though groups are beneficial to learning (Quin, Johnson, & Johnson, 1995), they are not created automatically and do not function automatically (Weimer, 2002). In the studio experiences that were described by the participants, students said they were expected to know how to work in groups without much teacher guidance on group dynamics. Students perceived this lack of instruction as resulting in clashing of personalities, work overload, and
the tendency to withdraw from working in groups. For instance, Judy and Monica described some of the experiences that they had while working in groups and came to the conclusion that they did not like that type of collaboration. Hence, they completed individual projects in their fourth-year first-semester, projects that were originally designed to be group projects.

The participants in this study chose a design studio in their fifth year that did not come with the expectation of collaborative work; therefore, it is possible that students who chose other design studio options might have done so precisely because they had more interest in group collaboration. However, the architecture professional program is a competitive program in a strong university that attracts and accepts students who do well in high school. Most current k-12 programs primarily support and reward individual work, and individual work is a stereotype that architecture has also privileged. Therefore, many high-school graduates have a hard time conforming to group collaboration and learning.

In relation to Chickering and Reisser’s third vector, moving through autonomy toward interdependence (Chickering & Reisser, 1993), the problem of personality differences and clashes with groups led several participants to make conscious decisions not to interact in formal groups but still maintain a positive relationship with other students. These students did not need “reassurance, affection, or approval from others” (Chickering & Reisser, p. 117), therefore either not achieving this vector or skipping it. The participants who voiced their opinion on working individually versus working in groups were the same participants who looked to their friends and other classmates for feedback, in terms of how to do certain tasks. Therefore even though they were trying to move away from the third vector, the students involved often found themselves seeking advice from others.
One-to-one instructor-student interactions that allowed students to grow included misunderstandings or non-understanding between the faculty and students. Although students perceived that faculty consciously intended for students not to understand or for them to misunderstand in order to enhance student learning experiences, students still had positive outcomes as a result of the instructor’s style of teaching. Chickering and Reisser (1993) mentioned that negative experiences could be good learning experiences and indicate that learning is actually transpiring in most negative experiences. In such instances, misunderstandings might be seen as negative in the case of the design studio, but they can also be seen as positive because they allowed students to think for themselves. The positive outcomes of these seemingly negative experiences included an appreciation for their instructors regardless of the year level and also the students’ awareness that they took part in their own knowledge construction. This awareness happened very early on in their college years (specifically in the second year).

In constructivist theory, participants in an environment actively construct knowledge (Papert, 1990). Being aware of this knowledge construction can encourage students to purposefully get help (This was described by Clare when she went to ask her friend who was located in another studio for feedback). Additionally, awareness of knowledge construction can help students value making several iterations—consciously designing and redesigning—and not to see this process as inefficient or a waste of time. For example, Michael specifically mentioned that he did not have a problem reiterating a design several times. Similarly, an awareness of active knowledge construction was exhibited when Judy expressed that she had to figure things out and teach herself because she was not being taught. She was frustrated at the lack of guidance at the time, but it benefited her in the end when she reported that she
thought that it might be best that the instructors do not tell you everything, allowing for
discovery. Michael’s and Judy’s perceptions are not only consistent with the constructivist
ideology (Fosnot, 1996), but also with learner-centered theory (Weimer, 2002).

When discussing the role of the teacher in groups, Weimer (2002) noted that teachers
in a learner-centered classroom should spend less time intervening and allow “students [to]
do more discovering” (p. 83). In the design studio, some instructors may have encouraged
students to do things that they did not believe that they wanted to do. Luke is prime example
of this experience, when he discussed his professor prodding him to work on what he thought
to be a nearly impossible project. These learning experiences helped students develop
intellectually and emotionally. Intellectual growth included thinking and learning skills, such
as how to draw or how to build a model. Additionally, their intellectual growth throughout
their four years of interacting in the design studio could be considered a process, including
learning how to make more out of less. For example, Monica reported frustration in her
second year when thinking about what she knew in fourth year and what she knew in second
year. She was able to say that she worked much faster and spent less time trying to figure out
how to do things, like drawing. Michael also talked about his experiences leading to
intellectual development as allowing him to do design as “second nature.”

Emotionally, participants of this study were frustrated and confused in their first and
second years, and both frustration and clarity occurred in their third and fourth years. The
frustrations that occurred were sometimes a result of peer-to-peer and instructor-to-student
interactions, but these frustrations allowed for emotional growth. An example of this is the
frustration that Monica felt when she did not understand her fourth-year instructor. She
mentioned that this instructor assigned one of the worst projects, but after reflecting on the
project, she said it was one of the projects she would like to go back to and redo, because at the time of the interview she finally understood why they were asked to do what they did. Another example is when Luke said that he wanted to quit, but then he thought about how far he had come and took appropriate actions (such as working harder) to help him overcome his frustration.

In conclusion, students’ interrelational learning experiences were interdependent in that they included interactions between students and instructors and also among the students themselves. The student-instructor interactions that were categorized as non-interactions or misunderstood interactions were often initially seen as negative, but their outcome was positive due to students being able to discover on their own and think about ways to solve problems. The student-to-student interaction was also a crucial learning experience. This occurred through groups, which allowed the participants to grow to a level of conscious decision-making about why they did not want to work in a group and yet, at the same time, maintain interdependent relationships with each other. Another way that group and individual learning experiences occurred was through collaboration. By the time students got to fourth year, though they relied less on each other in a group setting, they still sought feedback and relied on the critique of their peers. Their interrelational learning experiences, in essence, allowed the students to develop intellectually and emotionally, giving them ways to deal with and accept differences and also rethink and apply knowledge to projects and situations.

The eleventh American Psychological Association (APA) learner-centered psychological principle states that “learning is influenced by social interactions” (APA, par. 4-5). (See Appendix C for a list of the APA learner-centered psychological principles.) In line with the APA principle, participants in this study referred to social activities that were
non-academic as part of their learning experiences. Although the activities were non-academic, they influenced the participants’ production. Judy described this concept using the example of when she interacted with her friend while producing work. She said that it was nice to know that she was not alone in a situation, therefore allowing her to produce work more effectively. Luke also reminisced about the studio in Rome where he and his fellow students played hacky-sack and seemed to be much more productive compared to any other studio they had been in previously, taking into account that they actually spent less time in studio and more time playing.

The relationships the participants had formed over the years were close and lasting relationships with a few friends and professional relationships with other participants of the design studio. An example of a lasting relationship is the one between Judy and her second year peer. They became friends in second year and now consider themselves as best friends. The fourth vector in Chickering and Reisser (1993), *developing mature interpersonal relationships*, referred to the level of trust and communication that individuals with differences had. The friends and acquaintances that the participants in this study made became key people to call on for help (academic and non-academic), critique, encouragement, and play, which shows that there was a mature level of trust and caring in the design studios. Judy mentioned an example of encouragement when she consciously told herself that she would rather give positive feedback and not give negative feedback. In line with Judy’s preference for positive feedback, the American Psychological Association (APA) study stated that having a sense of caring from family and friends can help create a “positive climate for learning” (APA). Indeed, participants’ comments indicated that by their fourth year they genuinely cared for each other and for each person’s well-being. Luke gave an
example of how he and his friends would sing in studio to create a more fun environment in which to work. Therefore, he was consciously thinking about the well-being of his classmates.

On the other hand, Michael shared his thoughts about the competition that occurred in the design studio, but despite the unspoken competition, students were still able to maintain friendships. This ability to overcome competition to reach friendship represents the level of maturity that can be likened to what Reisser (1995) acknowledged—that accepting individual differences and cultural diversity can lead to better relationships. Trusting, communicating openly, and also being positive toward each other suggested that this vector was fulfilled in the participants’ design studios. Reisser (1995) explained that at this stage an individual “[affirms] one’s own values and beliefs, while respecting others’ view points” (p. 510).

**Learning Experiences as Transitions**

As discussed under the narrative for this domain, the transitions that students made in the studio setting were contingent upon the year level that they were in and how they perceived their experiences.

According to the participants of this study, when students start their education as architects in this setting, the first feelings that they encounter are those of frustration and confusion. As they move along the spiral of transition, the students’ feelings overlap with one another: interrelationally, emotionally, socially, and academically. Barr (1995) acknowledged that there is an interaction of frameworks in learning. These frameworks are ways of thinking, emotions, academics, and any other aspect that contributes to one’s learning. The way that students influence each other can be considered frameworks and through these frameworks their learning occurs.
Wilson (2002), in his study of learning in design education, stated that learning is “challenging” (p. 407). The perceptions that students have of their learning experiences are connected with the learning that occurs. An example of this phenomenon is when Monica perceived that her learning experiences were confusing and frustrating because she did not know how to do certain things. Reflecting back on these experiences, she concluded that the discovery of building models and skill-building activities was a “learning process.” Even though things came a lot slower in her first and second years, she was very quick and knowledgeable by the time she got to fourth and fifth years. So regardless of her perceptions at the time, she was learning how to build a model.

When participants reached their third year, they perceived their learning experiences as challenging and felt frustrated as well. This frustration, however, also led to clarity. Their clarity related to determining what they wanted to do in life, finding their style of designing and learning, and finding ways of being organized. Chickering and Reisser’s vectors, especially developing purpose and establishing identity (Chickering & Reisser, 1993) are excellent ways to view this perception because students moved from confusion to clarity through the conversations that they had with themselves. They engaged in deliberations about who they were and what they wanted to do in life (Riesser, 1995). For instance, Luke expressed that he did not know what architecture was about and did not know what he wanted to do in his third year of study. This uncertainty caused frustration to the point that he contemplated quitting. Because he had already gone through some frustrating situations in second year, he was able to manage his emotions and persevere. Luke said that he had “already come this far” so he asked himself the question, “Why would I quit?” He also asked
himself about his future and about what he wanted to do. Granted, in third year he did not find those answers, but he started engaging in the conversation with himself about the issue.

Michael, on the other hand, said that he realized what path he wanted to take in life in the first semester in his third year (developing purpose – Chickering & Reisser, 1993) and that, as a result, he was more focused and he started discovering his way of working (establishing identity – Chickering & Reisser). Similar to Clare, Michael had already made up his mind that he wanted to focus on sustainability as an interest by his second semester. He also knew that he wanted to work in a firm that shared these values in architectural design. Although Michael and Luke were at the same academic level, Michael had already engaged in and answered questions about who he wanted to be, while Luke was in the process of engaging, even struggling. His struggling could be attributed to the fact that he already knew what his style of working was. During the interview, Luke said that he knew how he worked and was very sure of himself. It, therefore, may have been harder for him to adjust to a different thought process and another tier of knowing, which included a new way of thinking.

The constructivist classroom allows for students to engage in this kind of thought where they are struggling and creating new knowledge (von Glasersfeld, 1996; Vygotsky, 1978). Moreover, the environment of the architectural design studio encouraged students to think outside their established norm, and therefore challenged attitudes and knowledge that students had constructed before they began their education in architecture. This may explain why the participants’ perceptions of their learning experiences up to the third year were framed by feelings of confusion, frustration, and, finally, clarity.
In the fourth year of study in the design studio, students perceived their learning experiences to be clear and transitional. An example of this is when Clare reflected on her second year instructor. Thinking about complex issues such as diagramming, Clare was able to reason through why her instructor was trying to make her paint a brick and stamp the pattern onto a piece of paper to make a pattern. The problem-based classroom supports the idea that students build on the knowledge that they already have and make connections between that existing knowledge and the new knowledge to solve problems (Eggen & Kauchak, 2006). This concept is also a characteristic of the constructivist classroom, where people construct knowledge and connect existing knowledge with new knowledge to form new constructions (von Glasersfeld, 2005; Henson, 2004; Schwandt, 2003; Shapiro, 2002).

**Outcomes of Learning Experiences**

Outcomes in this study refer to the learning that has occurred due to the participant’s learning experiences.

**Collective Process**

The collective process as a theme relates directly to the relationship of constructivism and constructionism. Since one of the tenants of constructivism supports the notion that the knowledge that exists is used to construct new knowledge (Fosnot & Dolk, 2001; Fosnot & Perry, 2005; Gabler & Schroeder, 2003), the knowledge that the participants in this study produced was due to the constructivist process. An example of this process is when Michael said that he saw what he had learned in his earlier years in design studio as “second nature,” and he was just learning new ways to improve on those former techniques. Michael meant that during the design process, when he was constructing his model (physically), he did not have to think about, reason, or debate about what techniques to use or how to go about it or
even what type of material he needed to perform a task that he already knew how to do. Rather, he focused on the new ways of physical construction, and, hence, new ways of building. He, therefore, used a constructivist process to aid in his understanding of how to go about making or doing, which is a characteristic of the culture of the architectural design studio.

In relation to brain research, studies have shown that new synapses are constructed when new exercises are performed (Bransford, Brown & Cocking, 2000), meaning that new skills have been learned. Problem-solving and analytical exercises help create knowledge (Caine & Caine, 1997; Sylvester, 1993); therefore, Michael’s construction of something new was attributed to existing information, but he learned something new while using new techniques. In the design studio, problem solving and analyzing situations are part of the design process, which again is part of the culture of the architectural design studio. This means that one of the outcomes of the learning experiences is the process of knowledge creation, which in the understanding of studio culture, which is achieved actively by doing. The design studios in this situation encouraged knowledge construction, through participants’ learning experiences, part of which were a collective process.

Reeves (1992) emphasized that constructivism in any learning environment regarded individuals as unique. Furthermore, brain research has asserted that “the more we learn, the more unique we become” (Caine & Caine, 1991, p. 87). Constructivism and social constructionism require that students contribute to their learning environment and, therefore, their uniqueness is taken into consideration. The participants did not suggest that there were only collective processes in the architecture design studios, and if that was the case, students would not be able to learn from each other. This is because learning is not only the acquiring
of knowledge but also the sharing of knowledge. Consequently, acknowledging the construction of new knowledge through the use of new techniques by several individuals within the design studio context confirms that social constructivism and constructionism are important theories through which design studio learning experiences can be viewed. In addition, the culture of the architectural design studio can begin to be understood through understanding students’ learning experiences.

**Learning Through Critical Reflection**

When the participants of this study looked back at the lessons learned from their experiences in design studio, they showed a strong ability to describe the process that they went through, reasoning through why they went through those experiences, sifting through how they understood the positive and negative factors of the learning experiences, and concluding with how they could have done things differently. An example of a participant who was able to describe the process that she went through critically was Monica, who admitted that third year was frustrating because she lacked understanding of the project requirements. But looking back, Monica believed that the project was well thought out and it would be a project that she would redo if she had the opportunity. Michael shared a similar experience. They both understood how the project was beneficial to them as the years went by.

Chickering and Reisser’s vector, *establishing identity* (Chickering & Reisser, 1993; Reisser, 1995), addressed the issue of students getting to know who they are as they address life issues. In the design studio, the participants, like Michael and Monica, attributed what they learned in their third year to their style of working. Although the learning experience of going through the project was frustrating, they were still able to reason through the process of
design and then apply the positive parts of the experiences to future design work. This process was a way of establishing their identity in their work. In addition, as students gained skills and abilities (developing competence - Chickering & Reisser), they used former knowledge to inform future aspirations (constructivism and constructionism - Papert, 1980; 1990; Vygotsky, 1978) and were able to understand their perceptions in-depth (Vygotsky).

The design studios as a learning environment aided in prompting these reflections because the studios also possessed some qualities of a learner-centered learning environment. The fourth and fifth of the 14 learner-centered principles are: strategic thinking and thinking about thinking (American Psychological Association, ¶ 4 & ¶ 5). Strategic thinking suggests that learners should be able to apply thinking skills and reasoning to accomplish a learning goal, while thinking about thinking suggests that students should be able reflect on how they think and learn and apply those strategies to future thinking and learning tasks (American Psychological Association; Weimer, 2002). Both Michael and Clare showed this type of thinking. For example, Michael stated, “And then, when I look back at it, it was one of the best projects that I have ever had. And if I had known that now or if I had done that now, now I could have done something pretty cool with it.” Michael also mentioned that the main point of the project was sustainability, which he perceived as unimportant at the time; but later, during the time of this interview, sustainability had become his main focus. This kind of reflexivity is also acknowledged by Agryis (1981), Anthony (1991), Austerlitz, Aravot, and Ben-Ze’ev (2002), and Schön (1985), where students are encouraged to reflect, reason, and conclude through the projects that they are assigned.

A learner-centered classroom, therefore, encourages participants to question, reason, and build on former knowledge (Bell, 1982). In addition, the environment focuses on
individual learners and, at the same time, group collaboration—these two characteristics are a key factors in the culture of the environment (McCombs & Whisler, 1998). Moreover, learner-centered principles are also constructivist in nature because they encourage the creation of knowledge (Henson, 2003) and the uniqueness of individuals (APA, par. 4).

**Creation of a Future Vision**

The seventh vector—*developing integrity* (Reisser, 1995)—addresses the creation of a future vision, which was also dependent on participants’ learning experiences. For some participants, their definitive learning experiences took place in Rome. Judy, in particular, was affected by what she observed as the European philosophy of building to last, rather than building to tear down (how she perceived American architecture). Because of this, she wanted to work in Europe rather than the United States and become part of that culture, but, at the same time, Judy planned to work to change the architecture attitude within the United States. She had even thought through how she could get licensed and practice both in Europe and the United States.

While Judy had accepted architecture in the United States, she thought that she could work both in Europe and the United States in order to make a difference. This thought process and the actions she wants to take can be described by the seventh vector, *developing integrity* (Chickering & Reisser, 1993; Reisser, 1995). Under this vector an individual experiences *humanizing* and *personal* values, and *develops congruence* where there is a recognition and acceptance of what exists, but also clarity of one’s own views. Judy’s personal values were clear in that she recognized what type of architecture existed in the United States, and was confident in her own beliefs about wanting to work outside of the country. She also had an interest in making money and was clear about that, but her interest
in financial security did not negatively affect her decision to be an international architect.

Reisser would describe this as the third aspect of *developing integrity*, which is *establishing congruence*. The congruency of Judy’s actions and her beliefs is, therefore, what establishes her integrity.

Also in terms of being humanistic and at the same time respecting other’s values (Reisser, 1995), Monica articulated her values and thought about her projects from her third year on as being “sustainable.” She questioned the reason she was in architecture, mainly because she was not sure if she would be able to associate herself with a field that was “taking a turn for the worse” in terms of sustainability. Monica came to the conclusion that by her making a difference, she could be instrumental in “helping us [the United States] get back on the right track.” Monica’s thought process and conclusion about the action she wanted to take exemplified the ideas of thinking critically and a learner-centered classroom that evokes thinking about thinking (APA, par. 4).

Both Monica and Judy were concerned about the built environment and ready to take strides to help with the current issues that architects face. Neither mentioned that the design studios prepared them to take on such challenges, but they discussed how the design studios got them thinking about the issues. Dutton (1984) addressed the reasons for the conditions in architecture and the role of the architect in such situations, and one reason was that the education of the architect was based on hypothetical design, construction, and building. Similarly, Salama (2005) was critical of the amount of time that was spent in the design studio on the form of a hypothetical building, rather than taking into consideration the context, meaning that students spent a great deal of time designing a form (or building) without a context. In the design studios described in this study, the assignments did not
provide the opportunity for students to implement their solutions in a real life situation and context, although the participants were made aware of contextual issues. This focus on the hypothetical then leads to a lack of knowledge about the issues that architects actually face. Even though problems and giving students the opportunity to solve them, are key factors in a successfully run problem-based learning environment (Cruickshank & Olander, 2002) and part of the architecture design studio culture, participants in this study were not prepared to face real-life situations. Reflecting on their design studio learning at the time and trying to educate themselves about architects in real-life situations by getting jobs in firms, shows that the participants of the design studio learning environment were able to process what they knew and then take action on what they thought they did not yet know. The process of trying to solve a problem (Margotson, 1994; Shannon & Brine, 1994)—in this scenario, the thought process of the individuals and the individuals in a group setting—is emphasized.

In conclusion, creating a vision was an outcome of the participants’ learning experiences. This outcome can be interpreted through the lens of Chickering and Reisser’s (1993) vectors, learner-centered terminology, and problem-based learning environment characteristics. The participants in this study all had visions of what they wanted to do in the future, ideas which were based on both humanistic and individual values. Participants also had a plan of action for how to begin to apply what they had learned to the real world through the vision that they had for their lives, and they had thought through and taken action to start to apply what they had learned in real-life situations.

**Honing a Way of Working**

The findings of this study indicated that a student’s way of working in the architectural design studio was tied back to several factors including, but not limited to
(because of the scope of this study), the influence of their course instructor (Salama, 1995), the student’s learning style, the student’s interests, and the type of environment of the studio.

In this design studio setting, students reported that studio instructors played an important role in the determination of how students worked and thought about design and the design process. The participants’ perceptions of the instructor made them realize that he or she may do things, think, and learn in particular ways. For example, Clare stated that she did not understand what the professor was doing, and she came to the conclusion that she was very linear and logical in her method of approaching design studio projects while her professor was not. Clare’s professor helped her realize her own design method by trying to impose his view of design on her. At the time (second year), Clare did not yet realize how she worked, but she started perfecting her linear and logical way of working from her third year on. Another example of how the instructors in this setting influenced the way students worked on projects is exhibited in the conversation that I had with Clare about the way she worked. Clare knew that doing extensive research was not for her and that her third year is when she realized that. Her instructor had asked them to do research and spent such a short time working on the project that Clare did not see the point of going through the research exercise, even in her future studios. On the other hand, Michael and Monica were conscious that the instructor had influenced them and they used the research and design techniques they learned to enhance their future projects.

Luke was the only participant in the group who said that he knew how he worked, even as early as high school. He said he was a doer, meaning that he wanted to see results. This confidence in his way of working caused internal conflict when he was accepted into the architecture program. Luke had the opportunity to either go to California to do construction
and start immediately seeing the results of his hands’ work, or to go to school. He chose to enroll in the architecture program, but Luke was not happy with not seeing the final product built in real life. He attributed his need to innovate and change lives, or as he said, “the world,” to this way of working, so when Luke got the opportunity to build something challenging and innovative in his fourth year, he had an epiphany. It was not the fact that he was building a precedent, it was the fact that the architect of his precedent was someone he thought was innovative and who had changed the world. Luke wanted his way of working to be refined by the study of the precedent building. This project also affected Luke’s decision to choose the same professor for his fifth-year independent project. Even though Luke already knew how he worked, he perceived that it all came together for him in his fourth year second semester.

Another example of how a style of learning affects one’s way of working is Michael, who said that he was a linear thinker. Michael said he had to do things in order, from one point to the next. He also said that he had just started trying to improve procrastination, which he attributed to his linear thinking. The last example of a style of learning that affected a student’s way of working was Clare, who explained that she was a very organized person. She perceived that this organization allowed her, unlike her peers, to get sleep and declare her work finished the day before the review. As seen in all of these examples, in order for students to begin to understand their visions for life, they also had to establish a way of working and how they went through the process of design.

The next area that can affect a student’s way of working is his or her interests. For example, Monica said that she was interested in sustainability. Once she realized this interest
in her third year, she consciously applied the knowledge to all her designs. She also came to the conclusion that she would be looking to work at a firm that has the same vision as hers.

Finally, the students’ way of working was also affected by the physical learning environment. Judy, for example, was in Europe when she realized her goal was to become an international architect. She had to experience the physical space of the studio in Europe, which Luke described as not only being in the building but the whole area (Rome). Luke was also shaped by experiencing the lack of equipment to produce work that was nearly impossible in his eyes in a different studio setting. In addition, Clare decided, because of her experience in working in groups, that she wanted to work alone on certain projects. Her physical space encouraged this because she was separated from her best friend, with whom she was used to working in groups. Instead of providing an open space like that of the Armory, which encouraged collaboration between studios, the Design building studio spaces were closed and separated by floor. Clare said, “It was so much easier in the Armory where you can go and grab someone and ask them to come and look at stuff, but now you have to go and seek them out and have to get them to come all the way over.”

Summary and Questions Answered

The purpose of this study was to develop an understanding of how students in their fifth year of architecture understand their learning experiences from their first-year to their fourth-year design studios. Using qualitative research methods, this study examined the meanings that 5 participants made of their learning experiences at Iowa State University in the Department of Architecture. The participants’ descriptions and perceptions of their learning experiences were examined, taking into consideration the interaction that occurred in the design studios.
A qualitative approach was appropriate for this study and congruent with my views on knowledge construction, interaction, and student development. The study emphasized looking at learning experiences through the eyes of the participants, who provided the reconstructions of their experiences as learners in their context.

In light of this goal, the following questions were answered:

1. How do particular architecture students currently taking a fifth-year design studio describe their learning experiences in their first- through fourth-year design studios at Iowa State University?

   Participants in this setting described their learning experiences as interrelational (which included self-driven and interdependent) experiences. As learners in the setting, these descriptions were dependent on factors such as other students, the physical space and also the instructor.

2. How do particular architecture students currently taking a fifth-year design studio perceive and give meaning to their learning experiences in first- through fourth-year design studios at Iowa State University?

   The participants in this setting perceived and gave meaning to their learning experiences by describing their feelings from year to year in transition from one level of knowing spiraling to another level of knowing affected by their projects and interactions in their design studios.

3. What are the outcomes of the learning experiences of these particular fifth-year architecture students in option studio that are exhibited in their fifth-year?

   The outcomes that are exhibited in their fifth year include the idea of a cumulative process, which is using previous knowledge to construct future knowledge; the ability to
reflect critically, meaning that students were able to think about thinking and also use strategic ways of thinking to solve problems; the creation of a vision, which was mainly a life-long plan for their lives and a specific area of focus; and finally, honing a way of working, affected by instructors’ persuasion, the student’s styles of learning, the students’ interests, and the physical environment.

In the next section, I discuss the limitation and strengths of this study.

Limitation and Strengths

One limitation stemmed from my personal experience in design studios as a student and an instructor. Since I have been a student and an instructor in the design studio, this could have caused bias in the interpretation of the findings. But by using member checking and reflexivity, I was able to think through what I was considering at the time and throughout the research process and to verify with participants that I was presenting the information correctly. Also, in relation to my experience in the design studio, while I taught the first-year course when the participants were first-year students and 4 participants had either heard of me or I had been an invited reviewer in one of their critiques, I was not an instructor for any of the participants. I feel that this enabled me to more easily establish rapport during the interviews and to get students to participate. In fact, I believe that participants were very frank and cooperative in their responses, and I would attribute their forthcoming and honest behavior to the fact that they felt comfortable with me. Regardless of this limitation, the implications of this inquiry were useful and have opened doors for further studies to be conducted in the architectural design studio and design education.
Implications for Practice

The findings of this study have implications for architectural or design students, architectural educators and administrators, and higher education researchers. The findings demonstrated a strong relationship among the participants in this study and how they construct knowledge. It showed that the experiences that students had in their design studios affected their thought process regarding the design process, life issues, life goals and visions, their way of working, and emotional stresses. The students described their learning experiences as being affected by the instructor, who played a big role in encouraging, discouraging, teaching, facilitating, coaching, and so on. Since this was the case, although my study did not include information from instructors on their teaching backgrounds, training or teaching methods, instructors may need to more strategically plan to learn about the nature of the student population. The findings showed that students came into their first year with previous thoughts on learning. As several scholars have realized, students, especially in their first year, come from a K-12 system that advocates certain methods of teaching, learning and thinking. These methods of teaching include the students as blank slates, making students think of the teacher as the guru of all knowledge. Also, what students know and how they think about what they know about learning in the design studio could be crucial to their development and growth. So regardless of the year that students are in, exercises like a discussion on their thoughts about design, their knowledge on skills, how they use those skills, and what they would like to accomplish by being in a particular studio, would be beneficial to their academic, social and emotional growth. Given the small studio sizes, this is a very possible feat. If there is a lack of knowledge of techniques for getting to know the student population, collaboration with other departments, such as the Center for
Teaching and Learning Excellence (CTLT), which provide support for faculty in such areas, is recommended.

Student development occurred throughout participants’ learning experiences in the design studios. Knowing where students are in terms of development and targeting the areas that need growth can get students to the level of thinking about thinking. Again, the nature of the design studio encourages one-to-one relationships both at the instructor-student and student-student level; therefore, instructors have the opportunity to assess where the students are at the beginning of the semester. The assessment could include a small survey asking what students expect of the design studio, how students think they learn, what type of skills the students know, and what goals (according to the goals presented in the syllabus) the students think they can achieve and would like to achieve. Additionally, students had many criticisms of instructors teaching methods. This may indicate that, as Anthony (1991) also pointed out, faculty should not rely on teaching methods that they learned from their former professors. This perpetuates ways of teaching that may not be suited to the students with whom they are now working.

Another factor that affected participants’ learning experiences was the physical nature of the learning environment. It was beneficial for students to go on field trips, because some of the students had their “aha” moments on these trips, whether out of state or out of the country. This means that the design studio physical space, regardless of whether it is the first or the fifth year, is not the only space that learning can occur. The department should consider adding a field trip component to the first-year curriculum. It may not be as feasible to take first-year students on field trips out of state or out of the city; therefore, learning outside of the armory space may include going across the streets or across campus.
The physical nature of the learning environment included the placement of participants in various studios. For the sake of collaboration, students would benefit from a conscious placement of students in open and shared spaces. Most of the participants’ development, in terms of intellect, emotions, and physical growth, occurred in their early years of design studio when the spaces are shared. This growth was attributed to collaboration of students between design studios, freedom of movement through spaces, and cross-studio social and academic interaction and learning. Therefore, design studios should be available for students in that type of open arrangement, and the administration should consider using this information when it comes to the design of new design studio facilities. One of the goals of the administration should be to strive for the maximum academic and social interaction of students, across physical studio spaces, which, according to the findings, are factors that enhance the students’ learning experiences.

The third implication is the purposeful and conscious application of learner-centered, problem-based, and constructivist principles. The design studio naturally heads in the direction of these principles, but regardless of whether the principles are currently intentionally used or not, students still perceive that they are confused and frustrated. Student confusion and frustration could therefore, be reduced if there was a simplification of design studio goals. This simplification would help students clearly understand what they should be learning academically throughout the semester. Clarity can be met by discussing goals not only at the beginning of the semester, but during the semester, by integrating the discussion into the teaching strategy of the instructor. This could mean that during project reviews, instructors reiterate the goals of the course and find areas in student work that have met these goals. It could also mean that any rubrics used should include these goals, and grading should
not only be based on what the instructor thinks might be “good design work” or how review went, but also on the accomplishment of the goals of the design studio course.

Another implication for practice relates back to the AIAS Task Force report that listed negative and positive aspects of architectural education. One negative aspect that stands out is the all-nighter. The participants of this study had reached a point in their studies where they made conscious decisions to stay up all night or not to stay up all night. One student particularly made a choice to “complete” her work the night before review so that she could get sufficient sleep. This inquiry indicated that the students were conscious of what they were doing and made educated decisions about their actions. Therefore, the importance, magnitude and pervasiveness of the all-nighter might be a myth that is perpetuated through the student population or the administration, or it might simply be a chosen work style of specific students. One participant mentioned that the all-nighter to her meant staying up and getting work done, whereas, according to her statement, she perceived that other people who boast about the all-nighter did not really get work done, but slept through some of their all-nighter time.

Other aspects that stand out in this study, that might have implications for practice include, the interdisciplinary nature of the design studio, and isolation of architecture students. The participants in this study did not describe the design studio had chosen their particular fifth year studio which was not interdisciplinary in terms of different majors integrated in one studio. On the contrary, the students chose to pick a studio with a professor that they viewed as different. Although this could constitute interdisciplinary work in the students’ eyes, it causes isolation of students from different disciplines, not only within the College of design but also outside the College. This might mean that the curriculum should
be designed to allow students to experience the interdisciplinary nature of the design studio before they graduate, and discourage isolation.

Taking into consideration these implications, recommendations for further research will be discussed next.

**Recommendations for Further Research**

Previous research in the architecture design studios does not address student development and the perceptions that students have of their learning experiences. This study helps to fill the gap that exists on this topic with regard to the architectural design studio. As such, in this section I discuss how this study provides opportunities for further research on student development in the architectural design studio and on the perceptions that students have of their learning experiences in that context.

Spending time with the students, I found that the choice they made for their fifth-year design studio was affected by their growth and development in their previous design studios, from their first to fourth years. This growth included a thought process that helped them examine why they wanted to have this particular instructor, as he defined the focus of the design studio. Therefore, it would be important to interview students who made different decisions in their studio choice. The students who choose a different type of design studio could use a different thought process, and if their learning experiences from their first through fourth years are similar, I cannot help but wonder whether learning experiences between the studios are the same, taking into consideration similar demographics. Research in this area would benefit the architectural design studio.

The normative student in the architectural design studio is a white male between the ages of 18 and 22, depending on his year of study. This study did not take into consideration
factors other than the contextual factors that affect student experiences in the design studio. Some other factors that would be worthy of study would be race, ethnicity, age, marital status, and socioeconomic status. For example, a question to ask that would expand this study is “How does race affect student perceptions of their learning experiences in their design studios?” Compared to the normative student characteristics, how do students of a different racial background perceive, make meaning of, and describe their learning experiences in the architectural design studio?

One thing that this study did not do was expand on Chickering and Reisser’s (1993) vectors of student development, as suggested by Schultz (1987). It would be interesting to look at student development models and address whether or not the models are suited to the environment of the design studio, and if so, how.

Additionally, an area that this study did not address was the idea of using cognitive development theory to understand student growth in their cognition. Results of the study suggest that students grow at several levels including academically, emotionally, and socially. An additional question that I would ask with regard to cognitive development is, “How do architecture students develop cognitively due to their design studios?” I also am interested in student metacognition. For example, what do students think about design when they begin a new design studio?

Another study that would be interesting is one that would focus on probing participants in the same setting as this inquiry to talk about the AIAS Studio Culture Task Force aspects, particularly focusing on whether these aspects are exhibited through learning experiences in the design studio. The students did not describe many learning experiences that related to the aspects. For example, one of the aspects talked about by the Task Force
was integrated learning in the design studio. Two questions to ask would be, “How do you bring information learned in other classes into your design studio and integrate it into your designs?” and “What learning experiences are exhibited through this integration?”

Future studies should also consider studying the perceptions that graduate architecture students have of their learning experiences in their design studios. I wonder whether their learning experiences would be the same as the undergraduate students, especially if the graduate students come from a background other than design. Normally, graduate students who do not have a background in design cover similar content compared to the undergraduate students but move very quickly to graduate in three, rather than five years. It would be interesting to compare how both groups of students develop through their years in design studio and how the process of development is different or similar.

In conclusion, this study gives rise to several other possible research endeavors. The study allows for students, educators in architecture and higher education, and collegiate architectural administrators to understand the perceptions that students have of their learning experiences in their design studios. Further research would either expand on the present study or tackle a new question about the architecture design studio.

**Personal Reflection**

I conclude this study with a personal reflection to allow the reader to understand how I thought through this study from beginning to the end. I also inserted some excerpts from my journal to give examples of how I felt at certain times during the research study.

My interest in the architectural design studio has been a long journey that began when I first started teaching in August of 2001. I was confused as to why I did not relate to the students the way I thought I would. I was a recent graduate and surely, I thought, students
and I would get along. On the contrary, I had a hard time teaching because I had preconceived notions about who the students were and thought that I could imitate my former professors in their style of teaching. I began to quickly realize that the students were individuals. How could I get to know them? How could I be a better instructor?

I started by looking inside out, looking at my shortcomings and how I could improve me. This meant studying myself and then seeing where I fit in terms of the education of the architect and designer in general. Enrolling in the Educational Leadership program at Iowa State University has been my biggest educational turning point. In the first year, I completed research and studied student development theory. I did not think that I was going to use that theory in any of the research that I was doing, but the theory has proven to be helpful in understanding myself and also beginning to understand my students.

After doing research on the teaching styles of the instructors in the design studio setting, I was satisfied, but I had not achieved my goal of understanding students. That is why I decided to focus on architecture students for this study. I had a lofty goal of studying all students, but my committee members kept telling me to narrow my focus. For this I am forever grateful because those who are successful in life do not always start big.

Although I had taught and speculated about students in the architectural design studio, this research has confirmed some of my beliefs about design studio education that include the instructor positively influencing the design students’ development, the use of students’ cumulative knowledge, and the importance of teaching and learning by getting to know students.

Although Boyer and Mitgang (1996) were impressed by design studio education and suggested that it can be used to educate other areas of education on learning environments, I
struggled to differ with them. I am now confident in the reality that much work needs to be done by the faculty to change the way the design studio is run. The design studio is not a prototype for other learning environments, but like other learning environments, it can be improved based upon the information being learned. I believe that the design studio, although not intentionally designed as learner-centered, problem-based, and constructivist, has certain aspects of these types of environments that have proven to be successful in other learning settings. An example of one of these aspects is one-to-one interaction. With the knowledge of certain schools of thought and application of the guidelines and methods of certain schools of thought, the design studio learning environment could be improved. Better yet, by inventing a new school of thought and methods, borrowing successful teaching and learning strategies from existing schools of thought, the design studio can become a prototype for learning.

Guidelines and methods of instruction that are successful will allow instructors to intentionally apply methods of teaching that are more understandable to students. These methods could also be made accessible to other fields in education, just like existing methods of instruction are accessible to design educators.

I also believe that there is much research that needs to be accomplished in the design studio setting. I would like to be part of the task of unfolding the design studio, so that there is as much breadth and depth of research in that setting as there is in any other educational setting. An excerpt from my journal illustrates this belief and how I felt after interviewing Michael:

This is a recurring theme: instructors not being able to convey what they require of students. The problem is that several instructors are not willing to change. I need to stay focused on the students, but I cannot help but think that the instructors may not
be willing to change. I am sure that architecture is not the only field where instructors are set in their ways, but at least many educators are educating themselves on the topic of student population change, learning style, teaching styles, and the like. It frustrates me when I think that there is nothing that I can do about it. But on the other hand, change begins with something small. I will be that small thing that starts the change, I hope. And the students...I wonder whether they can put themselves in the instructors’ shoes. It is so hard being an instructor in design because everything is so subjective. I wonder what my students thought of me when I taught…

My frustration about instructor knowledge of the student population has, in essence, driven this study. Particularly, intentionally learning to teach and teaching to learn is what helps me feel fulfilled in my role as a design educator. Understanding the learning experiences of students is only one step toward a greater goal.

Having said this, I end this dissertation with two thoughts. The first is a challenge to myself—to be an agent of change—and the second thought is to other design educators—to be open to change, especially when it comes to improving and enriching the learning experiences of the architect.
APPENDIX A

2004 & 2008 ENROLLMENT MANAGEMENT CRITERIA FOR THE COLLEGE OF DESIGN & ARCHITECTURE REQUIREMENTS

In 2004 (At the time the participants entered into the architecture program), the criteria for enrollment management was:

ARCHITECTURE PROGRAM
Inside College of Design
• Arch102: Design Studio I  4.0 credit hours
• DsnS183: Design Cultures  3.0 credit hours
• DsnS121: History of Arch  3.0 credit hours

Outside College of Design (General Education Requirements for architecture majors)
• Social Science and/or Humanities Electives  6.0 credit hours
• Math 142  4.0 credit hours
• Physics 111  4.0 credit hours
• English, Communications, Library Science  6.5 credit hours
Total  30.5 credit hours

High School Preparation for both the 2004 entering class and 2008:
Minimum high school course requirements for admission to the department and the College of Design include:

• 4 years of English
• 3 years of math (including one year each of algebra, geometry, and advanced algebra)
• 3 years of science (including one year each of two of the following: biology, chemistry, and physics)
• 2 years of social studies.

Students who plan to enter the architecture program are encouraged, but not required, to take at least:
• 1 semester of trigonometry
• 1 semester of analytic geometry
• 1 year of physics
• 1 year of studio art classes.

CORE DESIGN PROGRAM: 2008 ENROLLMENT MANAGEMENT CRITERIA
Each first-year student in the College of Design has an opportunity to apply to one or more degree programs after successful completion of the collegiate Core Design Program.
CORE DESIGN PROGRAM

Inside College of Design
• DsnS102: Design Studio I 4.0 credit hours
• DsnS131: Design Representation 4.0 credit hours
• DsnS183: Design Cultures 3.0 credit hours

Outside College of Design (General Education Recommendations for architecture majors)
• Social Science and/or Humanities Electives 6.0 credit hours
• Math 142 and/Physics 111 7.0 credit hours
• English, Communications, Library Science 6.5 credit hours
Total 30.5 credit hours

Application materials include an on-line application form, a written essay, and a portfolio of student work. Faculty teams from each program evaluate the materials of applicants. While all students submit the same materials, each program has its own set of admission criteria, detailed below.

ADMISSIONS FORMULA Enrollment-Managed Programs
The five enrollment-managed programs (Architecture, Graphic Design, Integrated Studio Arts, Interior Design, and Landscape Architecture) each utilize an individual formula for admission.

The Current Architecture Department formula:
GPA required courses (DsnS102, DsnS131, DsnS183, and English 150) : 40%
Portfolio: 30%
Essay: 15%
High school rating: 15% (if a student is coming directly from High School)

Retrieved from:
http://www.design.iastate.edu/CORE/FILEDIR/CoreAdmissions_2008-rev.pdf
http://www.design.iastate.edu/ARCH/applicationprocess.php
Figure 4. A model of design studio interaction (Lueth, 2003, p. 134)
APPENDIX C

APA 14 LEARNER-CENTERED PSYCHOLOGICAL PRINCIPLES

1. Nature of the learning process.
   The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience. There are different types of learning processes, for example, habit formation in motor learning; and learning that involves the generation of knowledge, or cognitive skills and learning strategies. Learning in schools emphasizes the use of intentional processes that students can use to construct meaning from information, experiences, and their own thoughts and beliefs. Successful learners are active, goal-directed, self-regulating, and assume personal responsibility for contributing to their own learning. The principles set forth in this document focus on this type of learning.

2. Goals of the learning process.
   The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge. The strategic nature of learning requires students to be goal directed. To construct useful representations of knowledge and to acquire the thinking and learning strategies necessary for continued learning success across the life span, students must generate and pursue personally relevant goals. Initially, students' short-term goals and learning may be sketchy in an area, but over time their understanding can be refined by filling gaps, resolving inconsistencies, and deepening their understanding of the subject matter so that they can reach longer-term goals. Educators can assist learners in creating meaningful learning goals that are consistent with both personal and educational aspirations and interests.

3. Construction of knowledge.
   The successful learner can link new information with existing knowledge in meaningful ways. Knowledge widens and deepens as students continue to build links between new information and experiences and their existing knowledge base. The nature of these links can take a variety of forms, such as adding to, modifying, or reorganizing existing knowledge or skills. How these links are made or develop may vary in different subject areas, and among students with varying talents, interests, and abilities. However, unless new knowledge becomes integrated with the learner's prior knowledge and understanding, this new knowledge remains isolated, cannot be used most effectively in new tasks, and does not transfer readily to new situations. Educators can assist learners in acquiring and integrating knowledge by a number of strategies that have been shown to be effective with learners of varying abilities, such as concept mapping and thematic organization or categorizing.

4. Strategic thinking.
   The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals. Successful learners use strategic thinking in their approach to learning, reasoning, problem solving, and concept learning. They understand and can use a variety of strategies to help them reach learning and performance goals, and to apply their knowledge in novel situations. They also continue to expand their repertoire of strategies by reflecting on the methods they use to see which
work well for them, by receiving guided instruction and feedback, and by observing or interacting with appropriate models. Learning outcomes can be enhanced if educators assist learners in developing, applying, and assessing their strategic learning skills.

5. **Thinking about thinking.**
   *Higher order strategies for selecting and monitoring mental operations facilitate creative and critical thinking.* Successful learners can reflect on how they think and learn, set reasonable learning or performance goals, select potentially appropriate learning strategies or methods, and monitor their progress toward these goals. In addition, successful learners know what to do if a problem occurs or if they are not making sufficient or timely progress toward a goal. They can generate alternative methods to reach their goal (or reassess the appropriateness and utility of the goal). Instructional methods that focus on helping learners develop these higher order (metacognitive) strategies can enhance student learning and personal responsibility for learning.

6. **Context of learning.**
   *Learning is influenced by environmental factors, including culture, technology, and instructional practices.* Learning does not occur in a vacuum. Teachers play a major interactive role with both the learner and the learning environment. Cultural or group influences on students can impact many educationally relevant variables, such as motivation, orientation toward learning, and ways of thinking. Technologies and instructional practices must be appropriate for learners' level of prior knowledge, cognitive abilities, and their learning and thinking strategies. The classroom environment, particularly the degree to which it is nurturing or not, can also have significant impacts on student learning.

**MOTIVATIONAL AND AFFECTIVE FACTORS**

7. **Motivational and emotional influences on learning.**
   *What and how much is learned is influenced by the learner's motivation. Motivation to learn, in turn, is influenced by the individual's emotional states, beliefs, interests and goals, and habits of thinking.* The rich internal world of thoughts, beliefs, goals, and expectations for success or failure can enhance or interfere with the learner's quality of thinking and information processing. Students' beliefs about themselves as learners and the nature of learning have a marked influence on motivation. Motivational and emotional factors also influence both the quality of thinking and information processing as well as an individual's motivation to learn. Positive emotions, such as curiosity, generally enhance motivation and facilitate learning and performance. Mild anxiety can also enhance learning and performance by focusing the learner's attention on a particular task. However, intense negative emotions (e.g., anxiety, panic, rage, insecurity) and related thoughts (e.g., worrying about competence, ruminating about failure, fearing punishment, ridicule, or stigmatizing labels) generally detract from motivation, interfere with learning, and contribute to low performance.

8. **Intrinsic motivation to learn.**
   *The learner's creativity, higher order thinking, and natural curiosity all contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty and difficulty, relevant to personal interests, and providing for personal choice and control.*
Curiosity, flexible and insightful thinking, and creativity are major indicators of the learners' intrinsic motivation to learn, which is in large part a function of meeting basic needs to be competent and to exercise personal control. Intrinsic motivation is facilitated on tasks that learners perceive as interesting and personally relevant and meaningful, appropriate in complexity and difficulty to the learners' abilities, and on which they believe they can succeed. Intrinsic motivation is also facilitated on tasks that are comparable to real-world situations and meet needs for choice and control. Educators can encourage and support learners' natural curiosity and motivation to learn by attending to individual differences in learners' perceptions of optimal novelty and difficulty, relevance, and personal choice and control.

9. **Effects of motivation on effort.**

   *Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without learners' motivation to learn, the willingness to exert this effort is unlikely without coercion.* Effort is another major indicator of motivation to learn. The acquisition of complex knowledge and skills demands the investment of considerable learner energy and strategic effort, along with persistence over time. Educators need to be concerned with facilitating motivation by strategies that enhance learner effort and commitment to learning and to achieving high standards of comprehension and understanding. Effective strategies include purposeful learning activities, guided by practices that enhance positive emotions and intrinsic motivation to learn, and methods that increase learners' perceptions that a task is interesting and personally relevant.

**DEVELOPMENTAL AND SOCIAL FACTORS**

10. **Developmental influences on learning.**

   *As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account.* Individuals learn best when material is appropriate to their developmental level and is presented in an enjoyable and interesting way. Because individual development varies across intellectual, social, emotional, and physical domains, achievement in different instructional domains may also vary. Overemphasis on one type of developmental readiness—such as reading readiness, for example—may preclude learners from demonstrating that they are more capable in other areas of performance. The cognitive, emotional, and social development of individual learners and how they interpret life experiences are affected by prior schooling, home, culture, and community factors. Early and continuing parental involvement in schooling, and the quality of language interactions and two-way communications between adults and children can influence these developmental areas. Awareness and understanding of developmental differences among children with and without emotional, physical, or intellectual disabilities, can facilitate the creation of optimal learning contexts.

11. **Social influences on learning.**

   *Learning is influenced by social interactions, interpersonal relations, and communication with others.* Learning can be enhanced when the learner has an
opportunity to interact and to collaborate with others on instructional tasks. Learning settings that allow for social interactions, and that respect diversity, encourage flexible thinking and social competence. In interactive and collaborative instructional contexts, individuals have an opportunity for perspective taking and reflective thinking that may lead to higher levels of cognitive, social, and moral development, as well as self-esteem. Quality personal relationships that provide stability, trust, and caring can increase learners' sense of belonging, self-respect and self-acceptance, and provide a positive climate for learning. Family influences, positive interpersonal support and instruction in self-motivation strategies can offset factors that interfere with optimal learning such as negative beliefs about competence in a particular subject, high levels of test anxiety, negative sex role expectations, and undue pressure to perform well. Positive learning climates can also help to establish the context for healthier levels of thinking, feeling, and behaving. Such contexts help learners feel safe to share ideas, actively participate in the learning process, and create a learning community.

INDIVIDUAL DIFFERENCES FACTORS

Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity. Individuals are born with and develop their own capabilities and talents. In addition, through learning and social acculturation, they have acquired their own preferences for how they like to learn and the pace at which they learn. However, these preferences are not always useful in helping learners reach their learning goals. Educators need to help students examine their learning preferences and expand or modify them, if necessary. The interaction between learner differences and curricular and environmental conditions is another key factor affecting learning outcomes. Educators need to be sensitive to individual differences, in general. They also need to attend to learner perceptions of the degree to which these differences are accepted and adapted to by varying instructional methods and materials.

13. Learning and diversity. 
Learning is most effective when differences in learners' linguistic, cultural, and social backgrounds are taken into account. The same basic principles of learning, motivation, and effective instruction apply to all learners. However, language, ethnicity, race, beliefs, and socioeconomic status all can influence learning. Careful attention to these factors in the instructional setting enhances the possibilities for designing and implementing appropriate learning environments. When learners perceive that their individual differences in abilities, backgrounds, cultures, and experiences are valued, respected, and accommodated in learning tasks and contexts, levels of motivation and achievement are enhanced.

Setting appropriately high and challenging standards and assessing the learner as well as learning progress -- including diagnostic, process, and outcome assessment -- are integral parts of the learning process. Assessment provides important information to both the learner and teacher at all stages of the learning process. Effective learning takes place when learners feel challenged to work towards appropriately high goals; therefore,
appraisal of the learner's cognitive strengths and weaknesses, as well as current knowledge and skills, is important for the selection of instructional materials of an optimal degree of difficulty. Ongoing assessment of the learner's understanding of the curricular material can provide valuable feedback to both learners and teachers about progress toward the learning goals. Standardized assessment of learner progress and outcomes assessment provides one type of information about achievement levels both within and across individuals that can inform various types of programmatic decisions. Performance assessments can provide other sources of information about the attainment of learning outcomes. Self-assessments of learning progress can also improve students self-appraisal skills and enhance motivation and self-directed learning.
APPENDIX D
INFORMED CONSENT DOCUMENT

Title of Study: The architectural design studio as a learning environment: A phenomenological exploration of fifth-year architecture design student learning experiences in their design studios from first- through fourth-year

Investigator: Patience L. Lueth

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time.

INTRODUCTION

The purpose of this study is to understand the perceptions that fifth-year design students in an option studio have of their learning experiences in their studios from their first-year to their fifth year. You are being invited to participate in this study because you are fifth year architecture student, who is currently enrolled in the designated design studio. You may also be a an instructor of a first-year design studio, a second, third, fourth or fifth year architecture design studio.

DESCRIPTION OF PROCEDURES

If you agree to participate in this study, your participation will last for the Spring and Summer semesters of 2007. During the study you may expect the following study procedures to be followed:

a) You will be asked to participate in 2-4 interviews. Each interview lasting between 1hr to 1hr 30min.

b) You will be asked to review a typed interpretation of the interview you participated in to make sure that is accurate and representative of what was discussed in both the Spring and summer semesters.

All interviews will be audio recorded. They will be kept in a secure place that only I (Patience Lueth) will have access to. Once the data is analyzed, and the dissertation is finished all information on these tapes will be erased.

RISKS

While participating in this study you may experience the following risks: The only thing might be that the participant may not feel comfortable sharing information with the
researcher, regarding their studio experiences and interactions with peers and instructors. Other than that, there are no known risks to this study.

**BENEFITS**

If you decide to participate in this study there may be no direct benefit to you. A benefit is defined as a desired outcome or advantage. It is hoped that the information gained in this study will benefit society by helping educators understand learning experiences that design students have in their learning environment. It may provide valuable information about instructor and student interaction, thus aid instructors to improve or change teaching techniques. It may inform administrators about the student experiences in a learning environment similar to design studios, aiding with the decision making process during curriculum development. It could allow students in this setting to understand how they learn. It will add to the literature on college student experiences, from the first-year level to the fourth or fifth-year level.

**COSTS AND COMPENSATION**

You will not have any costs from participating in this study and will not be compensated for participating in this study.

**PARTICIPANT RIGHTS**

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled.

**CONFIDENTIALITY**

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken:

a) the participants will be given a pseudonym
b) Any documented information will be securely lock in a file cabinet that only I (Patience Lueth) will have access to.

c) If the results are published, your identity will remain confidential.
**QUESTIONS OR PROBLEMS**

You are encouraged to ask questions at any time during this study.

- For further information about the study contact Patience Lueth. (515) 231-0990. popiyo@iastate.edu

- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office of Research Assurances, Iowa State University, Ames, Iowa 50011.

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**PARTICIPANT SIGNATURE**

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the written informed consent prior to your participation in the study.

Participant’s Name (printed) ________________________________________________

______________________________   _______________________________

(Participant’s Signature)   (Date)

**INVESTIGATOR STATEMENT**

I certify that the participant has been given adequate time to read and learn about the study and all of their questions have been answered. It is my opinion that the participant understands the purpose, risks, benefits and the procedures that will be followed in this study and has voluntarily agreed to participate.

________________________________________________________________________

(Signature of Person Obtaining Informed Consent)                   (Date)
APPENDIX E

EXAMPLES OF INTERVIEW QUESTIONS

EXAMPLES OF QUESTIONS

First interview

**Beginning questions:**
- Can you tell as much as possible about yourself and how you found yourself in the professional architecture program?
- How would you describe your learning experiences in first-year, second-year etc., design studio?

**Probing Questions:**
- Tell me more about your learning experience in first-year, second-year etc., design studio?
- What do you think you learned in first-year, second-year etc., design studio?

Second interview

**Beginning questions:**
- Remember when you told me about … (naming the experience)..<?
  - Tell me how you understand that experience?
  - How do you feel about this experience?

**Probing Question**
- Tell me more about how came to that understanding?

Focus Group
- Some of the themes that were consistent in your interviews were (name the theme).
  - Let us talk about your understanding of (such and such theme)
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