Empowerment and learning to design in a first semester studio: students' and their professor's experience integrating cultural feminist pedagogy into a traditional architecture program.

Jeannette Diaz

University of Massachusetts Amherst
EMPOWERMENT AND LEARNING TO DESIGN IN A FIRST SEMESTER STUDIO: STUDENTS' AND THEIR PROFESSOR'S EXPERIENCE INTEGRATING CULTURAL FEMINIST PEDAGOGY INTO A TRADITIONAL ARCHITECTURE PROGRAM

A Dissertation Presented
by
JEANNETTE DIAZ

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

September 1998

School of Education
EMPOWERMENT AND LEARNING TO DESIGN IN A FIRST SEMESTER STUDIO: STUDENTS’ AND THEIR PROFESSOR’S EXPERIENCE INTEGRATING CULTURAL FEMINIST PEDAGOGY INTO A TRADITIONAL ARCHITECTURE PROGRAM

A Dissertation Presented
by
JEANNETTE DIAZ

Approved as to style and content by:

Patt Dodds, Chair
Nicholas T. Dines, Member
Mary Deane Sorcinelli, Member

Bailey W. Jackson, Dean
School of Education
ACKNOWLEDGEMENTS

Life opportunities and personal achievements are only some of the threads woven by the wills and hearts of the many people that made this dissertation possible. For their nurturing of my soul and body, besides helping me color the material, organize and select among ever multiplying options of this tapestry I am most grateful and truly regret the impossibility of thanking them individually for their material help and intangible gifts.

I feel very privileged to have received a four-year fellowship from the Consejo de Desarrollo Cientifico y Humanistico of the Universidad Central de Venezuela in Caracas, as well as a three-year leave from teaching duties and a one-year sabbatical granted by the School of Architecture. I deeply appreciate their support and trust, and I hope I will honor their confidence and investment in me. In addition, I wish to thank Patrick Bertou, my advisor in Venezuela, who challenged and encouraged me to accomplish this life-project.

I am also extremely grateful to the support of Doris Shallcross, former director of the Creativity Program in the School of Education, and my fellow professors from the Landscape Architecture Program. Among these, I particularly thank Nick Dines, who opened the door of the graduate program, allowing to test my ideas about teaching creativity here, and Mary Deane Sorcinelli who, together with Nick and Patt, formed a supportive team for my doctoral program.

The keen insight, humor, care and intelligence of Patt Dodds allowed my outpouring divergence to make peace with the linear articulation so necessary to accomplish the work. Patt, I could not be more grateful for accepting the tutoring of this rare architecture bird, in flight through discipline boundaries, and for whom intuition and heart are the ultimate guides.

Leslie and her students are a living proof that change is possible. I could not have found a better case study to bring closure to this research cycle. Leslie, you not
only exposed yourself openly to my scrutiny and of your students, but you reviewed
my work with extraordinary care. Your presence as an architecture educator brought the
necessary field connection to this work. Nor less important, though not so evident were
the students and professors that collaborated and participated in the pilot studies, seed
of this dissertation. I dedicate this work to all of these participants with my sincere
appreciation.

Invaluable readers and editors have helped with this work: Thomas Dutton, my
best help in networking; Daria Fisk, another architect eye interested in alternative
education; Michael Dessen, a great son-in-law who put music bars to my literature
review; Lea Abiodun, Claire Baldwin and Mary McClintock. All were patient and
dedicated collaborators who helped me in the complex task of translating my thoughts
into clear English words. I appreciate as well the efforts of Linda Guthrie in transcribing
the interviews and Kyle Brown, an excellent assistant in the final graphics and printing.

Caterina and Rick, now part of the marvelous threads of my extended family: the
bonds created by our sharing will continue to grow stronger. Mariángelas and Beatriz
Elisa: I feel privileged to have the close and deep relationship we have built as an
interchangeable mother-daughter triad achieving another doctorate in “life” during this
period. My three children have highly rewarded me in my efforts trying to be the best
divorced mother I could. I am sure in Caracas Jorge Manuel, my very intelligent son, and
MayLing, my wonderful new daughter, will join Michael in continuing our family project of
enriching each other’s lives. It works!. To my brother Edgar, the best of the best, I want
to say that I appreciate your support and advice: "you worry about your studies, I will
take care of the rest". Here is the result. Aixa -my little sister, now not so little anymore-
your loving presence has been here more than you will ever imagine. "Madre mia," your
teaching and social work in Puerto Ayacucho, seem to have been transmitted by blood,
and are finally getting their way out. Thank you for your unfailing love. To my father,
grand-mother and Felix: I know you are bursting proud and smiling from above.
ABSTRACT

EMPOWERMENT AND LEARNING TO DESIGN IN A FIRST SEMESTER STUDIO: STUDENTS' AND THEIR PROFESSOR'S EXPERIENCE INTEGRATING CULTURAL FEMINIST PEDAGOGY INTO A TRADITIONAL ARCHITECTURE PROGRAM

SEPTEMBER 1998

JEANNETTE DIAZ, B.Arch., UNIVERSIDAD CENTRAL DE VENEZUELA
M.S., UNIVERSIDAD CENTRAL DE VENEZUELA
M.Ed., UNIVERSITY OF MASSACHUSETTS AMHERST
Ed.D., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Professor Patt Dodds

Design studios, the core of architectural education, are the locus in which students develop design skills while being socialized into the culture of the architectural profession. This qualitative case study examines a first year design studio taught by an experienced professor inspired by cultural feminist principles and student-centered pedagogy. This study explores the questions: (1) How do the professor's pedagogical principles influence and shape the educational dynamic within the design studio? (2) How are students' creative processes influenced by this professor's pedagogy? and, (3) What can be learned from this case study to make design studios supportive and positive learning environments?

Answering these questions led to the following conclusions:

(1) The professor's personal beliefs and professional values, love for teaching, and willingness to be a co-explorer of students' ideas shaped a studio dynamic in which students' individual needs and learning styles were acknowledged within the requirements of the School and Freshman Design Studios curricula. She consciously worked out conflicts between the program's traditional goals to architectural education (developing technically and aesthetically proficient, highly competitive architects) and her own student-centered, cultural feminist pedagogy (developing environmentally aware, socially just architects).
(2) The priority given to students' development as individuals meant sharing professorial authority and power. Her multidisciplinary background and experience promoted a creative pedagogy that empowered students as individuals and fostered a strong group identity through networking, thus increasing personal and collective responsibility for their work, self-awareness, confidence, and willingness to take risks in their approaches to design. Consequently, the studio dynamic evolved into a positive learning environment, supporting each student’s creative process and the quality of their designs and learning.

(3) This case study is an atypical learning environment for an introductory design studio within traditionally oriented professional degree programs. More in-depth studies are needed on the underlying premises of studios that create psychological climates leading to enhanced creativity and empowerment or to unproductiveness and frustration in students. Further, an interdisciplinary look at cultural politics could help build guidelines for better preparing architects to deal with the pressing demands for change in the profession and towards social justice.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iv</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>xii</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. A CONTEXTUAL PERSPECTIVE ON ARCHITECTURAL EDUCATION</td>
<td>7</td>
</tr>
<tr>
<td>Introduction</td>
<td>7</td>
</tr>
<tr>
<td>Social Sciences and Architecture Education:</td>
<td>10</td>
</tr>
<tr>
<td>Paradigms and Contributions</td>
<td></td>
</tr>
<tr>
<td>Urban Problems or Social Problems?</td>
<td>16</td>
</tr>
<tr>
<td>Contributions of Creativity Studies</td>
<td>19</td>
</tr>
<tr>
<td>Architecture as Art and Object-Centered Design Studios</td>
<td>25</td>
</tr>
<tr>
<td>A Review of Architecture Education Studies</td>
<td>27</td>
</tr>
<tr>
<td>The Princeton Report</td>
<td>30</td>
</tr>
<tr>
<td>The Papers</td>
<td>34</td>
</tr>
<tr>
<td>The Boyer and Mitgang Report</td>
<td>39</td>
</tr>
<tr>
<td>Building Bases for Alternative Approaches in Design Studio Pedagogy</td>
<td>41</td>
</tr>
<tr>
<td>Social Design and Social Architecture</td>
<td>44</td>
</tr>
<tr>
<td>Humanistic Psychology and a New Vision for Pedagogy</td>
<td>47</td>
</tr>
<tr>
<td>New Perspectives in the Nineties for Architecture Education</td>
<td>51</td>
</tr>
<tr>
<td>Constructivist Theories and Students' Voices</td>
<td>54</td>
</tr>
<tr>
<td>Feminist and Critical Perspectives on Architectural Education</td>
<td>58</td>
</tr>
<tr>
<td>III. METHODOLOGY</td>
<td>65</td>
</tr>
<tr>
<td>Purpose of This Case Study</td>
<td>65</td>
</tr>
<tr>
<td>Conceptual Guidelines</td>
<td>67</td>
</tr>
<tr>
<td>Role of the Researcher</td>
<td>67</td>
</tr>
<tr>
<td>Selecting the Case and Gaining Entrance</td>
<td>68</td>
</tr>
<tr>
<td>Data Collection</td>
<td>70</td>
</tr>
<tr>
<td>Participant Observation</td>
<td>71</td>
</tr>
<tr>
<td>Individual Interviews</td>
<td>71</td>
</tr>
</tbody>
</table>
IV. A FIRST SEMESTER ARCHITECTURE DESIGN STUDIO

The Studio...........................................................................82

The Professor ...................................................................89

Who is Professor Weisman?.............................................89
Leslie the Feminist ..........................................................93
Leslie the Architecture Scholar .......................................96
Leslie the Teacher ............................................................99

The Students ...................................................................101

Alana.................................................................................101
Alexis.................................................................................102
Dhamandeep.................................................................103
Eddie................................................................................105
Eric.................................................................................107
Franky..............................................................................109
Jae....................................................................................110
Josh...............................................................................112
Justin.............................................................................113
Matt.................................................................................114
Sean..............................................................................116
Steve...............................................................................117

The Dynamics: Studio Themes .........................................119

Pedagogy to Achieve the Design Studio "Know How" ..........121

Building Confidence.......................................................121
Group Networking ........................................................129
How Far Can First Semester Students Handle Cooperative Practices in the Studio?.................................135
Interaction for Creation ..................................................139

Acquiring the Design Studio "Know How" .........................144

Initial Baffling Days........................................................145
From "Where are the Ideas?" to "There are Ideas Everywhere.".................................................................148
Studio Play and Hard Work .............................................149
Socialization Tools: Learning the Language and Appreciating Design Beyond the Studio ......155
Finding Their Own Method ..............................................160
Studio Dynamics in the Context of Previous Pilot Studies ........................................171
A Design Studio as a Supportive and Positive Learning Environment .................177

V. CONCLUSION ........................................................................................................181
   Empowerment and Learning to Design .................................................................182
   Implications for Design Studio Pedagogy and Future Research .........................189
   Directions for Change .........................................................................................195

APPENDICES
A. CASE STUDY DOCUMENTS .................................................................................198
B. NEW JERSEY INSTITUTE OF TECHNOLOGY MATERIALS ............................208
C. BROCHURE OF THE SCHOOL OF ARCHITECTURE .................................Pocket Material
D. ARCH 163 INTRO TO DESIGN 1 MATERIALS ...........................................227
E. MATERIALS BY AND ABOUT PROFESSOR WEISMAN .............................244
F. MATERIALS FROM PILOT STUDIES ...............................................................261
G. OTHER MATERIALS ..........................................................................................264

BIBLIOGRAPHY .........................................................................................................267
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Students’ demographics</td>
<td>81</td>
</tr>
<tr>
<td>4.1</td>
<td>Studio themes</td>
<td>120</td>
</tr>
<tr>
<td>4.2</td>
<td>Dominant studio practices within pilot studies’ studio dynamic</td>
<td>174</td>
</tr>
<tr>
<td>4.3</td>
<td>Studio practices within the case study studio dynamic</td>
<td>176</td>
</tr>
<tr>
<td>5.1</td>
<td>Feminist educational principles (Weisman, 1996b pp.280-282) and traditional</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>architecture education’s underlying values (Dutton, 1991b)</td>
<td></td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4.1</td>
<td>The studio</td>
<td>88</td>
</tr>
<tr>
<td>4.2</td>
<td>Objectives of Leslie the Feminist</td>
<td>94</td>
</tr>
<tr>
<td>4.3</td>
<td>Objectives guiding Leslie the Architecture Scholar</td>
<td>97</td>
</tr>
<tr>
<td>4.4</td>
<td>Objectives of Leslie the Teacher</td>
<td>100</td>
</tr>
<tr>
<td>4.5</td>
<td>Principles and pedagogy of pilot studies studio dynamic</td>
<td>173</td>
</tr>
<tr>
<td>4.6</td>
<td>Principles and pedagogy of case study studio dynamic</td>
<td>175</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Architecture students, like others in programs that include design skills, live the unique and powerful experience of design studio courses. The design studio is meant to be the synthesizing experience of their professional training and the heart of the architectural educational process. In studios, students learn to design by developing projects with the guidance of a studio instructor. Through this “learning by doing” system (Schön, 1987) students are expected to develop their creative potential. In a typical studio, the input of instructors strongly affects students in different ways, depending on students' personal development and architectural expertise (Simmonds, 1981). Usually, students become so attached to their projects that student-instructor relationships are transformed into the triad “student-project-instructor.” Peers, even if apparently less significant in students' experience of studios, can be either antagonists or supporters. Students' strong reliance on their professor's one-on-one desk critiques and the competitive ambiance usually encouraged among peers augment students' isolation in the majority of design studios (Ahrentzen & Anthony, 1993a). Nevertheless, cases are found in which peers have been able to form a support network that helps them deal with pressures and stresses in design studios (Anthony, 1991).

Despite the fact that design courses constitute the center of professional education in various design fields, little scholarly research has been done on design studios. Among studies about design studio teaching and learning processes, only the thorough MIT Study (Porter & Kilbridge, 1981) was done based on observations of studio activities and interviews of students and teachers. Schön's (1983; 1985; 1987) publications about studios were based on the field work from the MIT Study. Other studies have focused on particular aspects of studio teaching, such as Dinham's (1989) and Bray's (1988) on design professors. The first looked at two professors' problem design and teaching strategies in studios and the second reports one professor's thinking processes. Other important investigations have been Anthony's (1991) on
architectural design juries and Ahrentzen and Anthony's (1993a) about gender issues in studio settings. Prior to this study there have been no qualitative studies from the dual perspective of both teacher and students in which students' design learning process has been addressed within the context of the teacher's beliefs and personal goals.

In the last decade, education scholars, feminists and critical pedagogues have dedicated attention to architectural education topics (Ahrentzen & McCoy, 1996; Boyer & Mitgang, 1996; Dutton, 1991b; 1996; Groat & Ahrentzen, 1997; Mitgang, 1997; Weisman, 1996b). These varied efforts account for not only a growing interest in looking more profoundly into architectural pedagogy, but in referencing successful studio practices, some of them diverging from the usual norms and philosophy of architecture schools (Feigenberg, 1991; Grant, 1991; Kingsley, 1991; Leavitt, 1991; Olving & Pastalan, 1996; Ward, 1991).

Among the several reasons accounting for the lack of research on design studios, I will consider two dilemmas stemming from the professional practice and its relation to the society it must serve. First, architecture education, like other professional training programs, is asked to comply with the curricular and accreditation issues which will guarantee students' technical preparation. This pragmatic orientation competes with principles of liberal education and interest in pedagogy and construction of knowledge. Second, favoring this pragmatic-oriented education brings forth another dilemma related to architectural practice. Architecture's expressed goal (creating social spaces) is at odds with its actual practice, most often detached from social and environmental concerns. The dominant ideology among practitioners is architecture-as-an-art-object, an ideology which follows the elitist tendency of the beginning of the profession (Cuff, 1991; Ward, 1991). This discrepancy is manifested in the realm of architecture education through a typical objectivistic architecture pedagogy that reduces students' learning design process to the manipulation of technical, spatial and aesthetic variables. When this objectivistic standpoint is assumed, object-centered studio projects and master-apprentice pedagogy in studios are favored, leaves little space for multidisciplinary research

The broader analytical level orienting this investigation was focused primarily on the educational philosophy held by the professor. These beliefs structure the learning environment of the studio and the socialization process into the architecture culture that both professor and students experience within architectural education settings. Contextualizing studio practices within this level of analysis allowed me to understand the importance and influence of values and beliefs of Professor Weisman in the shaping of the dynamics in this particular studio.

Studios are the locus in which students learn to design. They acquire skills and knowledge that will allow them to make architectural projects. To succeed in their studio work and fulfill the explicit academic studio objectives, students have to go through a parallel internal process. They must develop the new psychological qualities learning design requires as well as assimilate the architecture culture values that conditions such learning (Argyris, 1981; Stark et al., 1988). Students must acquire discipline habits and strengthen their self-assurance to take the risks necessary to learn design skills.

Professors are the facilitators of this parallel internal process in students, although most studio instructors are unaware of this role they play (Argyris, 1981). The great majority of design studio professors concentrate on transmitting to students what they believe are the "how to's" of design. They are conveying implicit messages about socialization into the architectural culture and about their own beliefs on education as part of the studio's "hidden curriculum" (Dutton, 1991b). The educational philosophy, which professors knowingly or not have espoused, conditions their relations and interactions with students and influences their process of learning.

Acquiring the package of architectural cultural codes and assumptions is just as important as learning design skills in order for students to be able to perform as architects (Cuff, 1991). It also helps build the connection between the worlds of education and practice. In studios, the architectural socialization process is guided by instructors within
the broader process of socialization of the larger culture (Bourdieu & Passeron, 1977). Studios and architectural schools, as other educational institutions, do not function in a vacuum. They are part of the larger culture, despite the claims of educators who see architecture as an object-centered practice, solely concerned with creating aesthetically pleasing buildings.

Through their pedagogy, professors inevitably reproduce their values and beliefs about architectural culture and education in general. Students on their part, through a slow subtle process, assimilate the intended architectural differentiation from the broader cultural realm of which they are a part (Willembrock, 1991). Through the same socialization process, the professors' philosophy about education reinforces or changes the power dynamics students have experienced throughout their educational life.

Opposing mainstream architectural education, critical pedagogues and feminist scholars face the dilemma of conflicts between their own ethical beliefs and those of mainstream architecture practice (Diaz, 1997a). To achieve the objectives of schools of architecture, these professors must transmit to their students the values, codes and attitudes of the existing architectural culture that conflict with their own beliefs about the construction of knowledge, social justice, and the use of the environment, among others.

By the same token, in most of their studio experiences, students are asked to deny or reject previously held cultural constructs in order to be enculturated into new principles of aesthetics and functionality. They have to go through the dual process of assimilating into architectural culture and detaching from their own cultural and social membership (Diaz, Buss & Tircuit, 1991). Depending on the students' gender and socio-economic position, this process can be a smooth transition or it can be a serious struggle between the students' socio-cultural roots and the new architectural culture. Nevertheless, when students are given adequate psychological support to value and build upon their own strengths, they experience productive and stimulating learning situations (Diaz, 1997a; Ward, 1991; Weisman, 1996a).
I was an architecture undergraduate in a five-year professional degree program in Venezuela and now I belong to the faculty of the same traditionally oriented School of Architecture from which I graduated. My life experience as a woman student and as a non-studio course professor has given me powerful motivation for this inquiry. Doing research as an international graduate student in education has enriched as well my initial insider's perspective.

I chose to study a design studio because it is architecture's core learning environment, and a freshman group because it was guided by an experienced professor whose innovative teaching approach was inspired by cultural feminist pedagogic principles. It is the purpose of my dissertation to provide at least preliminary answers to the following questions:

1. How do the professor's pedagogical principles influence and shape the educational dynamic within the design studio?

2. How are students' creative processes in developing their design projects influenced by this professor's pedagogy?

3. What can be learned from this case study to make design studios supportive and positive learning environments?

Three levels of possible significance are derived from this study. First, I hope that it will introduce architecture educators to this type of design studio experience which has been guided by cultural feminist principles and student-centered pedagogy within a traditional architecture school. This study offers an in-depth look at the studio dynamic from the double vantage point of students and their professor. Thus, it better portrays for architectural educators the complexity of this particular pedagogical modality, and the extent and possibilities of the professor's influence on the learning environment of the studio.

Second, I hope this portrayal will encourage architecture students and instructors to look at their own design studios critically and to push forward changes so that design
studios become healthy and positive environments for educating future socially responsible and creative architects.

Third, as a researcher I had both insider and outsider roles. My previous training and teaching experience in architecture outside the United States had several advantages. I was able to conduct the research with an insider perspective but I had to be attentive to the blind spots I might have. At the same time my familiarity with architecture education and being outside of the mainstream conditions allowed me to reach beyond the discipline. This double perspective facilitated the building of interdisciplinary bridges (Geddes, 1995) between the specific focus of the design experience and the psychological, cultural and political connections that sustain it, connecting it to the broader society.

This confluence of being a woman in architecture education and from another culture, having a dual perspective, brought the necessary depth and breadth to this study for clarifying directions of change for architecture education, particularly in design studios.
CHAPTER II
A CONTEXTUAL PERSPECTIVE ON ARCHITECTURAL EDUCATION

Introduction

There is an ample range of inquiries varying both in themes and in depth that could contribute to an understanding of students' design processes which are my main study focus. Throughout time, the paradigms ruling western architecture have shaped the same architectural education and design studio procedures. The most pervasive of these paradigms has been architecture as art and its counterpart, object-centered design. According to this way of thinking about architecture, buildings are to be designed as individual pieces of art, isolated from the social-political and cultural fabric (Ward, 1991). Architecture education has always faced the dilemma to fit the preparation for practice demanded by professional institutions with principles of liberal education aspiring to a wider scope of scholarship for university students (Ghirardo, 1990).

Architects themselves have done little research on architecture education and even less on studio practice (Boyer & Mitgang, 1996; Cuff, 1991; Dutton, 1991c; Lang, 1987). Regrettably, most education professionals as well have been uninterested in design studio pedagogy, thereby not taking advantage of this modality of experiential learning (Schön, 1987). Likewise, architecture schools, usually isolated from other departments at universities, have been largely outside the scope of academic interchange with other disciplines and thus have not been able to apply findings from educational researchers and other related fields.

Many enriching scholarly perspectives beyond the traditional paradigm are now being explored by feminist scholars, social architects, and critical pedagogues. Traditional postulates with respect to education and architecture studios have been challenged by feminist scholars (Ahrentzen, 1993; 1996; 1993a; Anthony, 1991; Groat, 1993a; 1996; Sutton, 1996; Weisman, 1996a; 1996b), social architects (Hatch, 1984; Ward, 1996), and critical pedagogues (Crysler, 1995; Dutton, 1991c; Giroux, 1988). Part of their common ground consists of two assumptions: (a) students should be recognized
as constructors of knowledge based on their culture, gender, and personal characteristics, and (b) that it is necessary to look at educational environments and architecture itself as arenas of the struggle for power among different socio-cultural groups in society. In-depth studies by this group of researchers have opened new possibilities for conceptualizing research and for using a different pedagogy in design studios based on constructivist theories and participatory architecture.

Creativity research as a field developed by scholars from various disciplines was included in this review assuming that one of the goals of architecture education and design studios is to expand students' creativity. Despite this obvious link, there has been little connection between architects and creativity researchers. Since the 50s (Guilford, 1950) creativity scholars have contributed different views about the study of creative people, products or processes (Arnold, 1962; Barron, 1962; Ghiselin, 1952; May, 1959a; Stein, 1962; Torrance, 1962). Architects have been the subjects in a thorough personality study done by MacKinnon (1961a), looking to determine correlation between personality traits and success in their profession. However, little has been done to study students' creative processes in design studios.

Some findings of early creativity research attracted architecture educators interested in design methodologies (Broadbent, 1973; Lawson, 1980), but there has been a lack of interdisciplinary projects focusing on architecture students' creativity development. Other creativity researchers have taken a holistic or a systemic perspective on the creative process (Csikszentmihályi, 1988; Montuori & Purser, 1995). In addition, there have been advances from psychologists engaged in creativity studies acknowledging differences in learning styles (Gardner, 1983) that reinforce arguments toward differences in ways of knowing of earlier feminist studies (Belenky, Clinchy, Goldberger & Tarule, 1986).

My intentions have been to build a contextual perspective from the meaningful studies out of different fields and viewpoints, as can be seen from this small sample. One strong interest driving this literature review has been to bring together contributions
that would help to understand the dynamics of the design studio from a social constructivist perspective.

Choosing a social constructivist perspective has two implications in this literature review. First, is the understanding and portrayal of relevant research within the connective tissue of its historical and cultural circumstances. Second, my motivation to improve design studios in this direction has driven me to emphasize the accounts of researchers and experiences guided by a critical and innovative spirit toward social commitment and change. Following these guidelines, I have structured this chapter in the following sections: (a) social sciences and architecture education: paradigms and contributions, (b) architecture as art and object-centered design studios, and (c) building bases for alternative approaches in design studio pedagogy.

As an introduction to the first section, I will discuss connections between two ideological paradigms conditioning the role social scientists and architects play in relation to education: (a) the philosophy of construction of knowledge and (b) the ethical concerns of architects and social scientists in relation to their contributions to society. I will then examine some of the implications of positivism in the discussion about architecture as art or science and in the Modern Movement theories. Also, I will comment on the physical determinist hypotheses, the initiation of advocacy and participatory roles of architects, and examples of creativity research that could be of value in the rethinking of a studio pedagogy.

In the second section, "Architecture-as-art and object-centered design studios", I will focus on the main architecture education studies conducted in the US in search of connections between architecture education and architecture practice, guided by the ideology of architecture-as-an-art. The purpose of this review is to demonstrate how the goals of educating an architecture professional according to mainstream practice has undermined improvement of architecture pedagogy. An additional intention has been to accent coincidences between the direction some of these studies point towards pedagogical improvement and certain research findings commented upon in the first section.
The third section of the chapter, "Building bases for alternative approaches in design studio pedagogy", will address pertinent literature from feminist scholars, critical pedagogues, and social architects. These writings have been especially useful to complement and illuminate findings from the data of the pilot studies (Diaz, 1997b) and to guide the choice of the case study of this dissertation.

**Social Sciences and Architecture Education: Paradigms and Contributions**

Issues about the creation of knowledge have been widely debated through time and according to critical scholars (Bourdieu, 1964; Freire, 1981; Giroux, 1988), their core is intrinsically related to who controls knowledge among groups in societies and cultures. Discussions about knowledge, the centerpiece of education, then, cannot be detached from the power dynamics involved in creating, disseminating, and applying knowledge. Architects are connected to other professional domains by their cultural and societal threads. To understand and bridge across disciplinary differences in the literature review, I have chosen to make use of concepts from Bordieu's (1977) theory on sociology of culture, thus assuming Architecture education as part of the reproduction of culture. Among Bordieu's (1977) assertions about the sociology of culture is the acknowledgment of the presence of academia in power struggles in society, whether or not academics are aware of their role (Stevens, 1995). This point of view complements referential parameters drawn from critical pedagogy (Dutton, 1991b; Dutton & Mann, 1996; Giroux, 1988; Ward, 1991; Ward, 1996). According to Giroux these parameters "situate[the] the theory and practice of architecture education within cultural politics that challenge not only disciplinary boundaries but also the institutional and ideological borders that shape Western industrial societies" (1991, p. x). The feminist discourse, as well, drawing its guidelines from a historical, social and cultural study of power relations, has served as an important theoretical support for central arguments of these papers (Ahrentzen, 1993; 1996; 1993a; Anthony, 1991; Groat, 1993a; 1996; Sutton, 1996; Weisman, 1996a; 1996b).
The two interacting parameters chosen are:

(a) the philosophy of construction of knowledge which conditions ways of building knowledge such as:

- Knowledge assumed as an objective construct independent of the person, and
- Knowledge considered to be constructed within a relational dynamic between the person and the world.

(b) the ethical concerns of architects and social scientists in relation to their contributions to society relating to knowledge assumptions referred to in (a) which guide professional practices of architects and social scientists.

Two examples synthesized from these divergent ways of constructing knowledge and the ethical positions of professionals with respect to their social role are:

1. If scholars and practitioners assume an objectivistic point of view, they also assume a non-political stance believing that in so doing they can detach themselves from the societal system. With critical theorists (Bourdieu, 1990), I believe this is also a political choice because researchers' preferences for particular focus and methods in their work implicitly include their ethical and political choices.

2. From a critical perspective, other scholars conclude that knowledge can only be constructed within the social dynamics. Professionals holding this point of view can either choose to ignore political issues, thus taking a neutral stance as objectivists, or commit to social change. In the first case, even though they acknowledge the influence of the social dynamics these academics still assume an objectivistic perspective in their work, detaching themselves from social purpose. In the second case, groups like feminist scholars, critical pedagogues, and social architects have different aims. These professionals want to unmask mechanisms that reproduce uneven power distribution in society, objectivism being one of those mechanisms, and many of them choose to play a more active role in modifying those conditions.
In the case of architecture, the assumed paradox between scientific and artistic aims has long served to exclude social responsibility from professional architectural activities. Architects, in most cases, assume they should be only doing architecture, arguing that politicians and activists take care of social issues and thus justifying their neutral stance. Architects' neutrality has been clearly articulated by Lang (1987), Rowe (1994) and others. Lang has been interested in constructing architecture theory in relation to behavioral science. Despite having declared his neutral position, this scholar acknowledges that "any categorization of the concerns of a field is biased by the views of the person making it, because it depends on that person's experience and attitudes" (Lang, 1987, p. 22).

Cuff (1989) with an anthropological perspective assumes Mead's (1959) perspective connecting individuals and society. This is reinforced by Schutz (1970), who portrays selfhood as an "intersubjective social reality" in which the assumed image of the individual and the image of society are mirror reflections. She claims that it is therefore not possible to detach ourselves from societal and cultural forces with which we interact and construct our selfhood and experiences.

These ideas about construction of knowledge permeate into educational communities through academics' ideological tendencies to one of these paradigms. The educational consequences are obviously quite different when consciously or unconsciously professors act upon the different political stances. At the same time, there are also differences in the way these paradigms are manifested according to the particular fields. In the case of architecture education, the studio system is the most important differentiation with other majors. This is also the place in which paradigms are manifested through student-teacher interactions while learning to design.

Architecture education has been guided principally by both the master-apprentice model, based on the transmission model of knowledge, and by an object-centered formalistic approach (Dutton, 1991b). In the design teaching-learning process, architecture knowledge is objectified, and pedagogy is focused on an object-centered or
decontextualized design project. The following examples will show differences between
design studio dynamic depending on the paradigm held by the professor in charge.

If an objectivist paradigm is assumed, the access to knowledge is done within a
hierarchical structure: the professor has the knowledge and the transmission to the
students is done in the professor’s terms. If the second paradigm is assumed,
knowledge is constructed by both professor and student within the interplay of their
backgrounds and determinants of the project. In this case, the access to knowledge will
be made by first acknowledging their mutual experiences. This will allow the construction
of a new knowledge, collective in nature and brought forth through the interaction
between student and teacher. The design studio dynamics in consequence will be
different depending on the way of creating knowledge espoused by the professor in
charge.

Designing a project is a complex learning process which students go through in
design studios, facilitated mostly by practitioner-professors. In their process of creating
design knowledge, students are expected to incorporate into their projects information
acquired in other courses, through interaction with peers, and materials. These
expectations are often contradicted by the teacher-centered model in practice, in which
students depend entirely on their professors. They must have “[a] willing suspension of
belief “ (Schön, 1985, p. 58) in order to grasp what the professor tries to teach them.
Literature on the effects of this pedagogical model on students’ learning experiences in
studios, as well as alternatives to this model, will be developed in the following sections
of this chapter.

The historical-contextual perspective of critical theorists and practicing social
architects has given me a broader view than the confined vision of object-centered
architecture, the dominant ideology of practitioners and educators of architecture today.
This latter category of professional practice favors product over process, and form and
aesthetics over social consequences of designs. On the contrary, social architecture
having a contextualized approach to design, favors the creation of spaces with active
involvement of the people who will live in such spaces, instead of the usual architecture practice as individual artistic creation.

There have been particular instances in architecture and its counterpart, architectural education, which can be better understood if looked at in the context of social science contributions. Some examples to be expanded in the rest of this section are the implications of positivism in the discussion about architecture being art or science and in the Modern Movement theories. Other illustrations of the connection between social sciences and architecture are the behaviorist determinist hypotheses linking human behavior with constructed space and the initiation of advocacy and participatory roles of architects as product of the socio-political awareness due to the social changes in the decade of the 60s. Ending this section, I have reviewed the creativity research that could be of value in the rethinking of a studio pedagogy with the goal of generating a stimulating learning environment to enhance students' creative learning process.

The conflict over architecture's location between art and science, which still permeates architecture freshmen as shown in student interviews for this case study (Diaz, 1997a), can be traced as far back as 1841. T.L. Donaldson, the secretary of the Royal Institute of British Architects (RIBA), articulated at his inauguration the existing ideological dualism between the two competing cultural groups within English society. Through two lectures, "Architecture as Art" and "Architecture as Science", Donaldson represented the culture of taste of the nobility and the culture of knowledge of the emerging and technologizing bourgeoisie (Ward, 1996). This ideological dualism between art and science has influenced architecture practice by detaching architecture from social issues, and thus "maintain[ing] a seamless image of professional theory and practice associated with a depoliticized fine art" (Ward, 1996, p. 31).

Architecture-as-science, as opposed to architecture-as-art, found in positivistic science the ideological support for the Modern Movement as it separated from classical styles and shifted from aesthetic formalism to functional design. Positivistic science, as the leading academic and scientific ideology of the modern era, has influenced architecture in different areas and levels, but its major influence was in the building of the Modern
Movement. Functionalism was architecture's response toward positivist requirements for the scientific legitimization of the Modern Movement. Architecture modernism required spaces to be functional, which meant that they should be fitted "scientifically" to human needs. The idea was to formulate and apply universal standards to suit modern necessities.

Le Corbusier's Modulor (1954), an architecture theory in which the human body proportions dictate guidelines for designs, represents one of the Modern Movement's principles in architecture. This standardization of human dimensions for design proposed in the Modulor went side by side with the imaginary user of architects when designing mass housing. In practical terms, this meant that architects had a theoretical system of proportions of a standard man to apply without distinction in designs for any human group or environment in the planet.

In architecture, Modern Movement has been a term almost interchangeable with functionalism and technologies for modern design. Mies van der Rohe's principle "less is more" and Louis Sullivan's "form follows function" were also others of modern architects' guidelines (Lang, 1987, p.4). In the design desk, these simple and rational principles seem to work but the results, which were to be better living environments and solution of urban problems, had complex negative effects not anticipated by the architects or developers.

Criticisms to the goals, ideas and work of the Modern Movement have been systematically addressed from different sources (Lang, 1987). Among these critiques have been the denunciation of the inconsistency of objectives and outcomes of large scale housing and inner city renewal projects (Gans, 1962; 1968; Jacobs, 1961). Behavioral scientists shifted the socio-political focus of these adverse evaluations and took the route of identifying human needs ignored by architects (Hall, 1959; Newman, 1962) or identification of the problems of the design process in its different phases (Goodman, 1971; Mitchell, 1974). These observations, among others having to do with the potential contribution of the behavioral sciences to the practice and education of
environmental design professionals, are subsumed by Lang (1987) in one major
overriding problem: that “the theoretical basis for design is inadequate” (Lang, 1987, p.7).

After World War II, Europe with pressing housing needs, welcomed minimum
standards and mass construction as a viable solutions to design more adequate spaces
within strong economic restrictions (Ward, 1996). Le Corbusier's premise that a house
should be a “machine for living”, accurately portrays the dominance of technology over
other considerations. Nevertheless, Le Corbusier himself experienced an unresolved art-
science conflict, corroborating the polarization and contradictory message for public
audiences and educational circles. While proposing standard housing plans for the
French government and emphasizing that a house is a machine for living, he also
designed buildings as art works that practically had to be crafted as sculptures, such as
the Ronchamp Chapel, one of the symbols of architecture's artistry. These contradictory
spatial statements are even more significant considering that Le Corbusier has been one
of the few architects who had published extensively detailed written accounts of
thoughts, reflections and guidelines for design.

Mass housing not only was a challenge for modernists in their profession and in
their way of thinking about design, it changed their relation with the client. In the modern
era, high rise buildings represent both technical rationality and incremental profits as real
estate investments, in addition to the imbedded cultural symbolism of avant-garde
modernity. The architect's role is tending to become more specialized so much so that
different architects are commissioned to do the general concept of the building, the façade
and the interior design to meet the functional requirements. The two-way client-architect
relationship has been growing during the modernist decades into a complex network of
professionals in which the architect became more a team member, while still maintaining
control of the formal aspects of the building (Cuff, 1991).

Urban Problems or Social Problems?

Another important connection between social sciences and space designers that
still permeates architecture theory and education first began early in the 20th century, in
this case between sociologists and town planners. The growth of violence, homelessness, and unemployment in populated industrial cities, labeled as urban problems, led to the development of town planning as a field to address sanitary problems through governmental actions.

Human ecology was introduced by the "Chicago School" as a new sociological field, translating concepts of biology into explanations of urban society and its problems. Social relations, according to this perspective, were viewed as being generated by the organization of the territory as well as by socio-psychological and linguistic dimensions. These sociology theories and investigations by psychologists (Sternberg & Sternberg, 1971) resonated with many in the architecture community. For example, the concept of the neighborhood unit emerged in the period between the two World Wars influenced by the Chicago sociologists. It was assumed that localization of facilities would lead to more human contact and greater participation in community life (Lang, 1987). Such participation would help to reduce the anomie of people in cities and strengthen democratic society (Perry, 1927).

In parallel, many European cities were facing the challenge to answer housing needs during the war decades, and also public housing movements were growing as collective political actions (Michelson, 1976). The Congress Internationaux d'Architecture Moderne (CIAM) meetings generated housing principles based on the impact of architecture in human behavior. These conferences, held from the 30's until the 50s, were concerned with human needs and maintained the idea "that through architectural and urban design all kinds of social pathologies could be eliminated" (Lang, 1987, p.102).

After the Depression years, with the recuperation of the American economy, the renewal of inner city slums also represented the opening of a new type of real estate investment. Urban renewal government projects guaranteed not only the elimination of slums and the accompanying problems, but also the revaluation of adjacent zones. Thus, the physical determinist hypothesis of human ecology, in which the built environment was seen as responsible for societal problems, fitted the needs of the urban real estate market and its emerging dynamics (Goodman, 1971).
The Westgate study was an influential investigation which directly involved architecture and behavior variables (Festinger, Schackter & Back, 1950). Festinger's research team examined the relationship between the physical layout of dwelling entries and face-to-face interaction patterns in a married student housing project. This research is thought to have marked the start of social science research in relation to architecture. The importance of this study lies in that Festinger's findings, which showed correlation between friendship patterns and the physical relationship of couples' front doors, pushed a reversed causal argument forward between design and behavior. It was easy to conclude from this correlation that architects, through a conscious design of the front doors in a housing project, could anticipate particular friendship patterns among residents of the project (Montgomery, 1989). This hypothesis of architectural determinism would become increasingly popular. Research following these guidelines strengthened architects' social image as well.

It is important to note that starting in the 30's scholars began to raise questions about the validity of the studies sustaining the determinist approach. Both these and later studies showed correlations between architecture and behavior variables. What was not clear in these deterministic studies were the specific circumstances in which the variables interact, nor the effect of other intervening variables. Environmental designers have been confused by contradictory comments, which point on one hand the fallacy of architectural determinism and on the other describe how the environment can affect users negatively. Physical determinism has been reinforced by a simplistic reading by designers of the mentioned sociological and psychological studies related to space (Lang, 1987).

The physical determinist hypotheses strengthened the image of architect's implying that these professionals not only could control the design of spaces but also through their design they were able to modify users' behavior. Architectural determinism underlies the belief system of most architects and students' acculturation in architectural schools. In terms of breaking disciplinary boundaries, the research work leading to physical determinist hypotheses evolved from the collaboration and theoretical
interchange between psychologists and architects. This effort has not been followed up with the intensity required except for ventures like the EDRA conferences (Environmental Design Research Association, 1969) one of the few current examples focused on studying and solving environment problems with an interdisciplinary perspective. I believe that to expand and contextualize space-behavior research with a critical-cultural perspective (Dutton, 1996) will include the pieces missing in the determinist formula.

Contributions of Creativity Studies

During the early 50s, a time of a US building boom which was a decade of prosperity for architects, the creativity field began to develop. With few exceptions, architects did not show interest in exploring the theoretical aspects linked to creativity, the essence of their work. Creativity research was initially supported due to military interests and later on industry and business leaders became interested in, looking for applications in personnel and new products development. Despite this last emphasis shown by many of its publications restated as self-help psychology manuals, there are valuable creativity findings which could be useful for design studio pedagogy in architectural education.

The creative process has been respected and feared, intriguing many civilizations and cultures. The nature of creativity has been a theme which has driven philosophers and art scholars of all times to search for creative individuals' common essence. Only forty years ago, psychologists and educators were attracted to the methodical study of creative individuals (Parnes & Harding, 1962). Their common initial approach has mainly been the modification of individual's behavior for a more effective performance in their action areas (Parnes, 1992).

Guilford's landmark address in 1950 has often been cited as the beginning of systematic research into the nature of creativity (Parnes & Harding, 1962). By that time, Guilford was convinced that creativity could not be measured by traditional intelligence tests. As a result of his studies, he proposed a three-dimensional model of the human intellect, challenging traditional conceptions about the structure of the intellect (Guilford,
1956). This model has been used widely as a point of reference in architecture-related literature (Lang, 1987; Moore & Gay, 1967).

A historical review of creativity studies exemplify these changing perspectives. The initial interest was in hereditary explanations for creativity (Galton, 1870) and gifted individuals (Cox, 1926; Terman, 1925). Earlier creativity studies were linked to the psychology of thought. Among these, the Wallas model stands out for architects interested in design methods being the first to specifically explore the creative process, describing it as a series of steps (Wallas, 1926). Later on, that model was subjected to experimental examination by Catherine Patrick, who studied creative thought in poets, artists and scientists (Patrick, 1935; 1937; 1938).

Creativity research began its development as a field by the work carried out by Guilford (1950; 1962), MacKinnon (1960b; 1960c) and Torrance (1962; 1964), all of which was mostly oriented to the measurement of creativity. They researched ways to differentiate creative traits from the personality indicators used to measure intelligence (Csikszentmihalyi & Getzels, 1973; 1968; Getzels & Csikszentmihalyi, 1976). The interest in quantitative procedures to assess creativity's evasive qualities and products has coexisted with a qualitative tendency influenced by humanistic and cultural studies. Nevertheless, improved creativity tests, based on earlier studies oriented toward measurement, are currently applied in many architecture schools as filtering devices in their application procedures.

The second line of creativity research, influenced by existentialist psychology (May, 1959a), cultural theories (Mead, 1959; Murphy, 1958; Stein, 1953) and humanistic psychologists (Fromm, 1959; Rogers, 1959), explored how to nurture individuals to develop their creative potential. Rollo May (1959) thought of creativity "[as] the encounter of the intensely conscious human being with his world" (May, 1959, p. 68). May (1959a), Maslow (1959; 1962) and Rogers (1962; 1969) believed in the creative impulse that leads to self-actualization in the direction of personal development and psychic health.
Many creativity studies, in which educators also participated, contributed to new educational guidelines being developed by humanistic psychologists (Rogers, 1969). This line of research advocated education programs for creativity and served to identify new pedagogical resources for creative thinking and problem-solving education in elementary and high school (Shallcross, 1967; 1981). Despite certain initial success in connecting with educational settings, creativity recommendations did not reach pedagogy in higher education.

Initiating their studies in 1949, Barron (1955) and MacKinnon (1960b) investigated people who were most highly effective in their chosen professions in order to define personality characteristics that made them that way. Among these psychological studies focusing on the creative person, only one so far has studied architecture professionals (MacKinnon, 1961a; 1964). MacKinnon's study of American architects corroborated Rank's theory that individuals go through three stages or phases of development in order to achieve their own individuality and realize their own creative potential (Rank, 1932). The architects chosen as members of stages I, II, III according to their recognized creativity, corresponded to the Rankian types of artist, conflicted, and adapted.

The architects who participated in this study were chosen by their peers, based on an assessment of their creativity. The most productive type of architects included in the study were found by MacKinnon to be very independent, with a high degree of tolerance for ambiguity, and greatly concerned with their personal adequacy. They were also highly productive, intelligent, motivated and had stronger communicational needs (MacKinnon, 1962c). Barron (1952) Münsterberg (1953) and Golann (1962) found, as well, that more creative individuals not only had stronger communication needs with their context but also a need of connection with themselves. In this line of thought, Stein (1962) sees the creative process as a intra and interpersonal communication.

MacKinnon's depiction of architects in terms of their creativity was also judged negatively: "some twenty years later, his [MacKinnon's] serious pictures seem more like naive caricatures" (Beinart, 1981 p. 260). MacKinnon's study, though aimed particularly
to reveal personality characteristics of architects, also offered important elements to consider in light of the latest creativity research and creative environments for education. He advanced educational recommendations which can be considered still relevant (MacKinnon, 1964). Among the divergent thinking strategies suggested were techniques based in intuition training, use of analogies, metaphors, symbolism based on personal experiences, and other exercises stimulating imagination. These are some of the techniques that could be incorporated in design studio teaching. In the further discussion of alternative perspectives in architectural education I have pointed out that for architecture students to obtain all the possible benefits of these techniques is necessary to include them as part of student-centered experiences looking at students' creative process as part of their personal development.

Beinart (1981) mentions two studies besides MacKinnon's that addressed creativity and architecture education. One was dedicated to creativity predictive tests (Moore, 1970) and the other one, done by an ACSA Committee on Creativity in Architectural Design, concluded that “The Committee feels that it cannot at this time definitely state that it believes certain procedures will be certain to aid in the development of creativity” (Association of Collegiate Schools of Architecture -Committee on Creativity in Architectural Design, 1964, p. 22).

At the time of the Architecture Education Study (1981), and Beinart's collaboration in it, creativity research had already begun to accumulate data indicating positive correlations between creative climate and creative behavior and products. Creative climate refers not only to particular activities or exercises but to the general dynamics encouraged in the learning environment. In this landmark architecture study, only the works of MacKinnon (1961) and De Bono (1973) were included from the creativity research already published.

In addition, there have been studies demonstrating the effectiveness of creativity training with different approaches and purposes. They range from application of general semantics theories to exercises to help in particular phases of creative problem solving situations. Among the best-known and longest standing programs for the deliberate
development of creativity are Upton's (1961; 1963) about creative analysis, applied both into academic courses and industry and further elaborated by Samson (1975) and Brunelle (1973). The popular work of De Bono (1967; 1968) on creative thinking, is based on the encouragement of lateral thinking (a kind of divergent thinking) instead of vertical thinking (a metaphor for a logical thinking pattern), on which traditional pedagogy methods are mostly built.

Another example that could generate resources for architecture education is the work developed on creative thinking by Gordon (1956). With his Harvard team, he has focused on the role of analogical connections and metaphors for creativity in the line explored by Herrmann (1989), developing the synectics system for instructional purposes (Gordon, 1961; 1965; 1971; Prince & Weaver, 1990). Through the application of this method, students are able to develop insights into their problems by applying solutions derived externally to the situation.

Herrmann's (1989) creativity training program is based in a four quadrant concept of the human brain and it encourages awareness in participants about their different learning and working modes. These techniques facilitate both for students and instructors the creation of a personalized and creative environment for learning, besides facilitating interpersonal relationships for group work. Design studios, if thought as an individual process to develop students' creativity, would gain greatly if both students and instructors had more knowledge of differences in students' ways of learning (Baxter-Magolda, 1992). At the same time, this knowledge could facilitate the process of collaborative learning needed for team working when developing projects in real situations (Cuff, 1991).

A manual selecting appropriate creativity techniques for the design process is Koberg's (1973). It is difficult to know about the extent and level of application of these creativity methods in architectural education settings. Examples I have known of such experiences outside of the US are González (1992), in Cuba, and Otero (1988) in Venezuela.
A particular characteristic of the architecture profession could be related to the time needed for an architect's creativity development. Representatives of different psychology schools of thought have agreed in considering creativity as a complex skill to be developed through an entire lifetime (Csikszentmihályi, 1996; Landau, 1987). Architecture is a field in which professionals have to rely heavily on their experience accumulated through time. This has been evidenced by the age at which architects have accumulated knowledge that would allow them to develop their best work, in comparison to professionals of other fields (Lang, 1987). This long-term concept for creativity development should be one important aspect to be taken into account when thinking about the four or six-year goals in the programs for the professional preparation of architects.

Csikszentmihályi (1988; 1996) acknowledges the need for a more comprehensive approach in creativity future studies, in which entrenched boundaries of person, product and process will be blurred. As a psychologist who for three decades has investigated, among other issues, personality traits and cognitive processes in art students and artists he affirms:

Finally, I came to the conclusion that in order to understand creativity one must enlarge the conception of what the process is, moving from an exclusive focus on the individual to a systemic perspective that includes the social and cultural context in which the "creative" person operates. (Csikszentmihályi, 1994, p. 135)

This argument exemplifies the theoretical shift in relation to creativity which is now occurring in psychology and education. From confining creativity to the personality realm focusing in techniques to better develop it, now cognitive researchers are acknowledging the role of social and cultural values within the process. I believe this opening represents a substantive contribution to the learning environment of studios, encouraging a closer attention to the role played by the social and cultural values which students both bring and interact with while learning to design architectural projects.

Another implication of this inclusion has to do with the disciplinary boundaries which would have to be expanded to develop a different educational approach in the studio system. The how could be guided by the interdisciplinary approach which
characterized creativity's beginnings as a field. Advocating a systems approach with a humanistic-ecological inclination, Montuori & Purser (1995) argue that a contextual approach to creativity will almost by necessity be interdisciplinary, historical, ecological, systemic, and aware of cultural and gender differences, while at the same time continuing to address personality issues (Montuori & Purser, 1995, p.106).

Amabile (1983), in one of her studies, shows us the range of relevant creativity issues we could take into account for architecture education. Amabile's model from a cognitive perspective presents the range of goals in design studios if conceived as creative learning environments. Design studios, according to her perspective, must integrate the acquisition of domain-related skills (technical, theoretical knowledge) with the creativity skills (design process knowledge) needed to design. In addition, this process cannot be achieved without an adequate task motivation (supportive learning environment).

A pedagogical model for architecture, capable of responding to the variety of recommendations by creativity researchers, must start within a different set of principles towards the design learning process. It should be highly student-centered while at the same time a pedagogical collaborative approach could be used to encourage personal creativity through team working methods. At the same time, the design learning process would be part of a highly flexible educational system to integrate individual differences with professional architecture requirements.

In the next section, the review of the main architecture education studies done to date, provides additional understanding of the architectural education culture. The focus of these studies will allow us to build a referential profile of the existing situation to be contrasted with the studies on studio pedagogy done in the last section of this chapter.

**Architecture as Art and Object-Centered Design Studios**

In looking for architecture theories guiding design studios, art and science have been the abstract components that seem to establish the connecting thread in time.
Architecture, due to this particular merging of art and science into a design skill, has a reputation of artistic mystery. This ideological cultural heritage qualifies architects as creative artists with high status and social recognition. This myth, almost deifying architects among other members of society, is continuously reinforced (Cuff, 1991). Society admires architects for their creative achievements, inferring that these are unachievable by lay people. This belief privileges architects and makes people disown dwelling spaces, thus disengaging themselves from the ongoing collective process of spatial creation.

At the same time, the introspective work mode of architects isolates them from the very people for whom they are designing, thus reinforcing the idealized cultural image of the lone genius (Cuff, 1991; Montuori & Purser, 1995; Saint, 1983). Besides, architects need to be recognized and valued as reliable and trustworthy members of their profession and they seek this societal recognition. Following Bourdieu's (1977) premises, architectural education is the earliest phase of support in reproducing the architecture culture within society.

Critical researchers (1996; Dutton, 1991c; Ward, 1996) explain architecture's social legacy according to principles of political economy. This legacy "has rather more often been one [of] producing, allowing, or celebrating the activity of those in power, often at the expense of large numbers of disadvantaged others" (Ward, 1996, p. 27). This critical theory allows us to understand the paradoxical role played by many architects. Architecture's contradictory legacy is transmitted to students in design studios who are asked to design buildings for people whose cultures, needs, or spatial preferences are mostly ignored.

Architecture-as-an-art-object, as an elitist ideology, has been reinforced by attempts to validate architectural design scientifically. Presuming architecture as science has strengthened architects' power role in society conforming to the mystification phenomenon (Cuff, 1991) and inspiring the majority of practitioners and architecture education programs today.
Post-modernism is one of the latest architecture trends debated in design studios at the present. Post-modernist followers look for support in the architecture-as-an-art-object ideology, appropriating liberatory ideas of postmodern critique and using them for conservative ends (Ward, 1996, p. 55).

The more representative studies on architecture education have been oriented by professional institutions guided in turn by architect culture “mystification strategy.” These studies aim for an apolitical, technical proficiency, ignoring the on-going struggle of competing political interests in the urban space dynamics. Unstated objectives of architecture institutions within goals of the “mystification strategy” could in part explain the lack of debate about pedagogical and educational issues leading to structural changes.

Reproduction of this mainstream architecture culture is fostered by the master-apprenticeship pedagogical model in studios. This choice underscores knowledge transmission over creation of new knowledge and individualism over collaboration. This emphasis could be damaging for students’ creative processes, depending mainly on the teaching quality and personality of the professors in charge of design studios and perpetuating the master-apprenticeship cycle (Diaz, 1997b). In addition, such emphasis poses a serious contradiction between the innovative professional architects must become and the educational system forming them.

A Review of Architecture Education Studies

In the United States, there has been one comprehensive architecture education study at the collegiate level per decade from 1929 to the nineties. As an exception, in the decade of the 60s, four studies were done. After this prolific decade, an academic manifesto was produced in the 70s that stimulated the development of a further in-depth study compiled by Porter & Kilbridge (1981). In the 90s, five national architecture organizations with an unusual collaborative effort promoted a study about professional education and practice by an independent scholar not related to the field (Boyer & Mitgang, 1996).
Besides these nine comprehensive studies, in the last ten years new themes related to architecture education have been incorporated, mostly in research and journal publishing, though few books have been dedicated particularly to this subject. The themes explored refer to gender issues in studios, critical pedagogy, and participatory projects among others. Qualitative methodologies, first used in the 1981 study, lately have been applied with more frequency to explore pedagogical issues with a different perspective than guided earlier studies.

A 1929 study started a series of seven which were oriented by the need to establish similar levels of proficiency in architecture education at the collegiate level. The themes of all seven studies focused mainly on methods/systems of professional accreditation and on the ideal knowledge architects should have to perform their job well in society.

The first two of these seven studies were proposed by the Association of Collegiate Schools of Architecture (ACSA), the professional organization responsible for assessing the quality of architecture schools. In the first one (Bosworth & Childs, 1932), many interesting approaches to architecture instruction in the schools not accredited by ACSA were reported. As a result, strict minimum standards were reconsidered in favor of a more qualitative basis for membership, relying on first-hand inspection of applicant schools. The difficulties encountered in the second study (Young & Goldsmith, 1940) to provide an exhaustive survey updating the 1930's work, led to the establishment of the National Architectural Accrediting Board (NAAB) as a joint project of the American Institute of Architects (AIA), ACSA, and the National Council of Architectural Registration Boards (NCARB). Thus ACSA was relieved of the responsibility for assessing the quality of

---

the schools. These two descriptive studies initiated the process of data collecting about existing architecture schools without including further considerations or recommendations.

The next five studies were commissioned by the American Institute of Architects between 1949 and 1967. Among these, two have made particularly important contributions, with different perspectives, to architecture education and practice. In 1949, the AIA created a special Commission for the Survey of Education and Registration. This commission was asked to provide facts about architects and how they practiced. "The Architect at Mid-Century: Evolution and Achievement" was "the first major attempt to describe, on the basis of statistical data interpreted by the collective judgment of professional men, the nature of the practice of architecture and the evolution as well as the present educational methods to prepare youth for practice" (Porter & Kilbridge, 1981, p. 838).

The methods used in this study involved a questionnaire survey of practitioners, registration boards, and the architecture schools, along with considerable research into historical writings on architecture and its accompanying professional education. From the findings of this research came multiple recommendations to the AIA regarding school/profession relations, teaching materials for the schools, programs for architecture faculty members, the structure of architecture schools, internship programs, registration examination procedures, and the advancement of architecture research. A few of these have been implemented since this time by architecture schools.

This 1949 study depicts the intentions of architects to do what was considered a scientific study in the 50s. The objectives and accomplishments of this study exemplify the influence of the positivistic paradigm dominating the scene in academic communities. The results acknowledged by Bosworth and Childs (1932) regarding the validity of different programs for architecture education and gains made due to their personal visits to institutions from the 1929 study were somewhat lost in this 1949 later study. The quantitative historicism of "The Architect at Mid-Century" misses, in my judgment, central points about the studio-centered architecture education. The overall vision based on numbers for certain issues was useful to build up basic data, but the use of this survey
data to generalize about the nature of programs for all schools didn't prove to be an adequate approach. The variety of architecture curricula prevalent at the time wasn't reflected in this statistical representation. Furthermore, the proposal to homogenize programs denied the merits of the many existing educational initiatives and their capacity to generate their own guiding parameters.

The Princeton Report. The last of these seven historical studies again demonstrated the failure of plans conceived autocratically, despite their good intentions. The Princeton Report, officially titled A Study of Education for Environmental Design, conveyed a new vision for the architecture academic community. With this proposal Geddes wanted to push forward a structural re-formation of architecture education in synchronicity with the historic moment (Porter & Kilbridge, 1981). This study responded to the progressive era of the 60s in which the boundaries of architecture were being expanded through collaboration with town planners, social scientists, design methodologists and systems building technologists. New fields of environmental design and urban design joined architecture, landscape architecture, and regional planning.

Among the recommendations of the Princeton report, architectural design education goals were to be defined by each setting. As an example, the Princeton School declared three objectives: “(a) education for the development of competence to work effectively as a designer and planner of the built environment, (b) education for continuing intellectual growth and adaptability to change, and (c) education for the development of images and models of better society and their manifestations on the built environment” (Geddes, 1995, p. 6). The Geddes team acknowledged many of the conflicts and tensions to accomplish these objectives, dealing with the diversity of scopes, scales, and processes of environmental design (the new term for architecture in its expanded role). Therefore, it was agreed that a monolithic educational model wouldn't work.
The Princeton report proposed a modular, jointed framework for environmental design education flexible enough to accommodate the needs of the existing variety of architecture schools nationally.

A matrix with three sets of coordinates illustrated the range of responsibilities in the field of environmental design. These were (a) scale: component, unit, group, district, area and region; (b) scope: research, feasibility study, design proposal, communication, and implementation; (c) process: identification, formulation, prediction, selection, management, and evaluation... An illustration of this structure was a set of hexagonal cubes, rotating to reveal different career components, which were joined together to show the cumulative structure of a career in education and practice (Geddes, 1995, p.6).

An interdisciplinary team of educational psychologists and teaching specialists worked with the Education Testing Service specialists in order to build the component modules for this new vision of architecture education so that they could fit together effectively. This team developed a method for curricular development and evaluation, based on performance criteria, that was specifically tailored for the first time to the design professions. In the words of the National Architectural Accrediting Board, “This method and language for the development and evaluation of architecture education is now the basis of the schools' national accrediting procedure” (Geddes, 1995, p.7). The guiding principle of this proposal was that:

.... the life-long education of an architect be experienced as a series of modules that are open to many possible connections to other modules of education, internship and practice... For both students and practitioners, they would be operationally joined together, with wide freedom of choice. For both schools and the professions, they would build ladders and bridges, ladders of advancing educational and professional levels bridges to other disciplines and professions” (Geddes, 1995, pp.7-8).

Geddes, who coordinated the Princeton Report, noted years later (Geddes, 1995) that he would propose three things differently. In his opinion, this project failed because from the outset, as an architecture education project, “it should have built ladders and bridges to the ACSA, AIP, American Society of Landscape Architecture (ASLA), CEP, NSPE, and other design professions...”(Geddes, 1995, p.8) as a way to generate political support. Second, he “...would emphasize the role of the humanities in...
design education” and if architecture is to be a learned profession and not be divorced from the human realities of life today, “the understanding of how people relate to buildings must be the foundation of architecture design in the professional schools” (Geddes, 1995, p.9).

Geddes' statement brings forth two important themes related to this proposal: the curricular content and the implementation of the plan. According to the proposal's goals, students are expected to broaden their knowledge of other domains and encourage connections with their socio-economic context. Through a more liberal-oriented curriculum, students would become architects who would be sound professionals, cultivated thinkers, and socially responsible professionals.

One of the central issues always present in discussions about architecture education has been the balance between technical preparation and liberal background within the time constraints of programs. Moreover, design studios absorb a great proportion of time for students to acquire architecture's “know how”. Advocates for a pragmatist professional proficiency envision instructing architecture students through the design of socially decontextualized spaces, following the artist/technician myth. At the other extreme, supporters of socially responsible architecture think architecture students should know about their socio-political connections with the wider society and understand causes and effects of their projects.

American architecture education, despite program accreditation regulations guaranteeing certain curricular uniformity, illustrates a wide variety of educational experiences among colleges and universities. While some institutions have agreed on common goals for their graduates, others have assumed an eclectic position, allowing coexistence of disparate and even opposite design philosophies to guide design studio experiences (Boyer & Mitgang, 1996). Architects usually do not write about their educational experiences; therefore it is difficult to know with certainty what is going on in design studios. Clarke (1994) concluded an interesting study analyzing students' transcripts which showed astonishing examples of how students meet credit requirements for their architecture degree. Even though this is not a comprehensive
study, it certainly points out questionable disparities between what the institution legally assumes as given and what is happening in reality with students' qualifications.

In regard to the failure of the implementation phase of the Princeton report, Geddes publicly recognized his naivety in trying to push forward the changes espoused without considering the politics involved. It is very difficult to deal with educational proposals and more so if changes suggested are drastic. In any change situation, ethical issues are involved and people's beliefs are put on trial (Sarason, 1982). In order to achieve meaningful restructuring in architecture education, ethical issues will have to be weighed and political stances will be at stake. For example, in the case of the Princeton report, many architecture educators must have been confronted with the prospect of teaching differently. Instead of teaching to design an “architecture object” they would have to address in addition the complexities of the object's context. Furthermore, in order to accomplish this task, architecture students would no longer work solo but would have to engage openly in team work. Until now, architecture educators have had difficulty acknowledging and transmitting in design studios that in real practice architecture is more team work than individual creation (Cuff, 1991).

The Princeton report had long-range and ambitious goals with its national lifelong modular learning proposal for the education of architects. Personal interests and ideologies were inevitably challenged at each architecture school by this request for a radical academic shift. Though it was in the architecture field, the proposal's failure reflects a crucial issue for education in general in relation to change. Established norms entitle privileges and structures. In design studios, the mastery-mystery system secures professors with a protective cage against student confrontations that could threaten their authority (Argyris, 1981).

Besides, even within the existing administrative parameters of the time, I don't think enough efforts were made to gather support from architecture schools. The political error as explained by Geddes, I think, fell short in estimating the scope of the support needed for such a radical change. In addition to the support from architecture institutions
that he admitted wasn't sought, a more democratic participatory strategy was needed to guarantee real involvement in a gradual process of change.

Geddes indicated that architecture educators were "divorced from the human realities of life today" (Geddes, 1995, p.8). If a critical perspective were used now to make Geddes' "building ladders and bridges" plan happen, we would need to renegotiate political allegiances and challenge dominant forms of power. The Princeton Report, despite its positive intentions, failed not only for the radical changes proposed but because it was a hierarchical plan, even though experts of various fields had participated as a team.

The Princeton proposal might well have had more success if it had been approached as a participatory experience, but it probably was much too far ahead of the dominant architecture educational structures of the moment. For this proposal to be implemented at the national level a great deal of collaborative work and pilot initiatives would have been advisable beforehand to build, phase by phase, a participatory process.

The Papers. After these initial studies of American architecture education, including the radical 1967 Princeton Report, a 1973 manifesto by the East Coast Schools of Architecture Consortium resulted in an exceptional research project (Porter & Kilbridge, 1981). This manifesto expressed their concern for the lack of fit between architecture education and the demands of changing society and practice. Eight years later, in 1981, the response to the 1973 manifesto took form in the Architecture Education Study, commonly called The Papers (Porter & Kilbridge, 1981). Sponsored by the same US East Coast schools group, and directed by Julian Beinart, professor of the MIT Architecture School, this study was "the first concerted effort to probe and evaluate the process of design studio learning" (Porter & Kilbridge, 1981, p. x). Despite this study's importance and uniqueness, The Papers were never actually published, though this report has been acknowledged as a required reference in architecture education scholarship.
Initially, the Architecture Education Study addressed the relationship of the professional curriculum to practicing professional architects, society, new knowledge, and the university. As the work progressed, the central focus shifted to the concerns of architecture professors and students at the micro-level of the design studio. The discussions were focused then on questions such as, How do students learn architecture? How does teaching aid that learning process? and, What constitutes learning for the practicing architect?

The final product of this three-year project consisted of two volumes: The Papers (Volume I) grouped seven reflective papers on different topics of architecture education, some of them using results of the research; and The Cases (Volume II), described two of the case studies and a student profile based on one of the cases. I consider this study to be a turning point in architecture education for two reasons. It was the first to address teaching/learning process issues directly, and it was the first study in which qualitative methodologies were used to achieve an in-depth analysis of the design studio.

The work of four of the authors from The Papers' project pertain more directly to the objectives of my work. These include one of the case studies coordinated by Simmonds (1981) and three papers by Beinart (1981), Argyris (1981) and Schön (1981). This last scholar has published additional books in which material from the protocol observed in the design studios chosen as case studies has been used (Schön, 1983; 1985; 1987).

Simmonds (1981) reported on the case study of a first year graduate architecture design studio. He focused on how the messages of the instructor influenced the development of the twelve students in the course. The messages were collected through his speech, written handouts, program and task programming, and design teaching. The case study results showed how students had changed “according to [their] attitudes to architecture and the decision making and learning modes with which they had come into the program” (Simmonds, 1981, p. 9). These changes were assumed to be a result of their contact with Quist's [the instructor] multi-level messages during the semester of the studio.
As organizational consultants, Schön (1981) and Argyris (1981) jointly had developed a communication model which they applied to understand the studio dynamics (Argyris & Schön, 1974). Schön (1983; 1985; 1987) has been promoting studio practice as a learning experience to be applied in other disciplines, echoing Simon (1976) who "has argued for a science of design as the fundamental knowledge-base underlying all professional education" (Schön, 1985, p.7). Argyris was more interested in the implementation of corrective measures to change studio inadequacies. Schön's books have become a standard reference in architecture education (Dinham, 1989; Lang, 1987; Rowe, 1994), although his ideas also have received challenging critiques (Ahrentzen & Anthony, 1993a; Dutton, 1991b; Willembrock, 1991).

Two central issues in Schon's ideas about studios are (a) the skill of reflection-in-action to be developed by the student and (b) the coaching attitude to be put in practice by the teacher (Schön, 1987). According to Schön, reflection-in-action would be the capacity to "reflect in the midst of action without interrupting it" (Schön, 1987, p. 26). In a studio critique, this would be applied to the "thinking [which] serves to reshape what we are doing while we are doing it" (Schön, 1987, p. 26). In short, the student should be encouraged to acquire awareness of the process, explicating (verbally or internally) reasons for developing phases or drawing moves in a project.

I support Schön's advocacy for students and professors to make explicit their awareness of the design process, although this advocacy premise failed to consider one important aspect. I think that even the intent to make explicit design thoughts (both from students and instructors) contributes to the creative process and project. Creativity research has long experienced the difficulties of dealing with a mainly subjective process, not possible to be studied directly. Therefore, I believe Schön's behaviorist communicational vision it is too simplistic. He basically assumes that students' behavior and attitudes can be modified without changing the prevalent studio system that sustain such attitudes. At the same time, he doesn't make concrete suggestions to encourage students' reflection on their processes when designing or to develop the adequate learning-teaching interaction with instructors to accomplish this task. Perhaps this
absence has to do with Schönc and Argyris not themselves being designers and not having had a first-hand experience of the design process.

The other observation I have about Schönc's theory-in-action and his "espoused paradigm," paraphrasing his concept of espoused theory, is the contradiction between his advocacy for the coach concept for the design instructor, stemming from humanistic psychology (Rogers, 1969), and his beliefs in an idealized version of the master-apprentice model. In his books about this subject, after advocating the coach-student relationship as an ideal relationship, he continues to address the instructor as the master. In Schönc's paper "Learning a language, learning to design" (1981) he acknowledged serious student-instructor communication problems which were down-played in his later published books on design studios.

This is, in my view, a weak point in his beliefs about his philosophy of knowledge tinted by a hierarchical, power-structured model. While in theory he proposes the coach role for humanizing the relationship between student and teacher, the example dialogues show that the hierarchical structure remained present (Schönc, 1987).

The design studio pedagogy which emerged from this philosophy has concrete effects on the dynamics between student and professor and on the students' design learning process. Argyris and Schönc (1981) have described this model in detail, calling it Model I theory-in-use, acknowledging that the problems derived from this model "are not unique to architecture education; they plague most of professional education and practice" (Argyris and Schönc, 1981, p. 563).

These problems, labeled as communicational, have been disregarded by Schönc in his further publications and by scholars with the same objectivist perspective in their studies (Dinham, 1989; 1990; Lang, 1987; Schönc, 1983; 1985; 1987). The abuse of power, reported by students in design studios, had been considered by Argyris (1981) and Schönc (1981) as an effect of negative teacher's theories-in-use. Argyris adding his view on students' role in the studio dynamic affirms:

[by] saying that the teachers' theories-in-use will tend to dominate those of the students, I certainly do not mean to imply that students have different theories-in-
use and therefore would be more effective if given greater control over their own training. Students can probably be very helpful in providing another perspective and students may espouse a more egalitarian and growth-oriented learning theory. However, in my experience, whenever students attempted to transform their views into theories-in-use, they did not create learning environments that are substantially different from those that already exist (1981, p. 563).

Despite Argyris' accuracy in describing some of the problematic issues of design studios, his objectivist-behaviorist approach limits further explanations. Why are students not capable of transforming their socialization patterns derived from the master-apprenticeship model? This question is what moves my inquiry to the socio-cultural elaborations of feminists and critical pedagogues.

The master-apprentice model is based on the “transmission” educational philosophy and its socio-political implications have been discussed by critical pedagogues (Dutton, 1991a; Freire, 1981; Giroux, 1988). Advocates of liberal education believe that educating architects should aim toward a broader vision of participation in society and interrelationships with other disciplines. Liberal architecture educators (Ghirardo, 1990; Groat, 1990) also believe that, through a more interdisciplinary education, future designers will be better prepared and more respectful toward society and the environment.

Two major problems have been detected within the socialization process that goes on in studios. First, values or codes are rarely clearly defined; only indirect clues will lead students to understand and assimilate them (Argyris, 1981; Schön, 1981; Simmonds, 1981). This lack of clearly defined principles contributes to the communication problems students acknowledge as a major obstacle in their design learning process (Argyris, 1981). Second, students' previous processes of constructing knowledge become obsolete and inadequate (Willembrock, 1991).

The first conflict is aggravated by the "learning by doing" studio system in which a student "is expected to plunge into the studio, trying from the very outset to do what he does not yet know how to do, in order to get the sort of experience that will help him learn what designing means" (Schön, 1985, p. 57). The second problem is exemplified
by the experience of an undergraduate: "we were expected to unlearn [sic] everything we absorbed in high school and before" (Willembrock, 1991).

My point, drawn from constructivist educational theories (Baxter-Magolda, 1992), students' testimonies (Diaz, 1997b), and my personal experiences, is that design studios, as a type of experiential learning, should be built upon students' previous experiences rather than dismissing their previous knowledge and values. This doesn't mean that students won't have to open themselves to new learning patterns like the half-verbal, half-graphic studio interactions. For some students, to change acquired educational patterns may feel more threatening. Thus, they will resist the introduction of changes that could lead them to a more responsible and collaborative teaching-learning experience in their architecture design studios.

The Boyer and Mitgang Report. This report (1996) is the most recent publication focused on architecture education and architecture as a profession. It is the first study commissioned by the five most important national architecture organizations: the American Institute of Architects (AIA), the Association of Collegiate Schools of Architecture (ACSA), the American Institute of Architecture Students (AIAS), the National Council of Architectural Registration Boards (NCARB), and the National Architectural Accrediting Board, Inc. (NACAB). During the thirty-month period of the study, the research team collected data through 4 surveys from 15 accredited schools. Additionally, the researchers reviewed significant past studies on architecture education, read accreditation reports from 50 schools, visited the 15 schools surveyed, and visited 24 architecture firms, interviewing 60 interns. In the 15 schools visited, they also interviewed in small groups 300 students, 150 faculty members, and 25 deans and department heads. Researchers received 500 responses from these surveys (faculty, students and alumni). In addition, they mailed surveys to deans, department heads, and chairs of the 103 accredited architecture schools and 6 candidate architecture programs and obtained 83 replies representing 65 schools.
The surveys included open questions asking about purposes and priorities of architecture, strengths and shortcoming of respondents' own educational experiences and any changes they would like to see in architecture education and practice. Administrators were asked to send additional information about promising practices at their institutions.

The report is based on premises previously developed by Boyer in his work on educational scholarship (Boyer, 1990). It was organized expanding on the goals which should guide socially responsible architecture education and practice. I find this work valuable as an updated reference compilation of interesting educational initiatives in practice in US architecture schools. Its humanistic educational statements, despite the inclusion of some moralistic admonitions, would make few people disagree with it. Nonetheless, it has elicited criticism from disappointed architects, like some scholars from the Harvard Graduate School of Design (Beach, 1996; Burns, 1996; Sapers, 1996).

Sapers (1996), for example, notes that even though the report recognized deficiencies both in architecture education and practice, it does not propose concrete recommendations. In addition, the authors' encouragement of diversity in architecture education programs is viewed as an inconvenient compromise.

By quoting a wide variety of disparate (and sometimes contrary) views, each of us can locate his own voice on the page; each of us has been heard. By supporting inconsistent remediation, the report supports the diversity it admires but provides very little direction for the future (Sapers, 1996, p. 54).

Burns (1996) points out that the report acknowledges

[T]he very real problems of education of architects [are]: relations between the academy and the profession; stresses and isolation of students; the conflicts surrounding architecture scholarship within the university; the paucity of women and minorities; inflexibility, imbalance, and narrowness of some curricula; and problems of internship and continuing education. However, it takes no positions. To effect change, not only must action align reality with values, but also values themselves may have to change. Unfortunately, the report does very little to clarify either existing circumstances or opposing values. By not taking a position of its own on any of these problems and by not airing serious differences, the report squanders its leadership potential (Burns, 1996, p. 54).

Beach (1996) supports the same critical position towards the report. She refers to the “unwritten code of silence” (Boyer & Mitgang, 1996, p. 94) that prevails among
students during design studio reviews, impeding their expression. Beach suggests that
this is not something new. Why such a code exists would be a better question to ask
and how do design studio professors create learning environments that inhibit/constrain
student expression.

I believe this report could be used as a starting point to explore in depth both the
flaws encountered in architecture schools and the initiatives that seem to be providing
benefits. An example of this is communication issues in studios, a topic initially studied in
the Architecture Education Study (Porter & Kilbridge, 1981). I think student-instructor
communication is not solely a problem of group dynamics or communication
effectiveness, as Schön and Argyris (1981; 1974) argued. Further and more profound
implications could be explored through qualitative methodologies to advance beyond
what already is known.

In Boyer's Goal 5 (1996) the special challenges mentioned could very well serve
as research orientations. "Do schools promote clear, open communications within
classrooms, studios, design juries? Do they foster effective communication with non-
architects in other schools and disciplines on campuses? How successfully do they
promote diversity of students or faculty?" (Boyer & Mitgang, 1996, p. 91). His
conclusion about learning communities is a very general statement, nevertheless it has
the merit of highlighting an almost never asked question: "...is this school a place where
students are supported, not put on trial, where communication is clear and mutually
respectful, where all groups are actively sought out, and where the community regularly
celebrates itself?" (Boyer & Mitgang, 1996, p.108). Within the same chapter is found
information about alternative approaches or activities for teaching design which have
improved the studio dynamic that were alluded to by Sapers (1996).

Building Bases for Alternative Approaches in Design Studio Pedagogy

I have been interested in bringing together accomplishments from different
disciplines that could benefit design studio pedagogy. In a different level, I also believe
in the need to change educational paradigms which have prevailed in architecture
programs. In this investigation, I have found that proposals for structural changes have come mostly from scholars who consider architecture education in light of social reform (Ahrentzen & McCoy, 1996; Dutton, 1991c; Grant, 1991; Groat & Ahrentzen, 1996; Ward, 1996; Weisman, 1996b).

The research boom in the 1960s made it possible to start building the foundations for a different educational paradigm. Interdisciplinary collaborations initiated in that decade enriched the architecture field with perspectives and methodologies previously unknown to the architecture community (Lang, 1987; Rapoport, 1969; Sommer, 1983). Regrettably, these theoretical advances, generated at certain academic levels, did not reach the rest of the academic system, and had even less impact on the rest of the professional community and society. These interdisciplinary approaches or participatory experiences between architects and social scientists, that will be discussed further on in this chapter, did not fully develop or multiply because of the lack of a cultural and societal basis of support to accomplish these changes.

Thirty years later, much more academic work has accumulated and qualitative and participatory educational experiences have slowly begun to have an academic space of their own (Ahrentzen & McCoy, 1996; Dutton, 1996; Ward, 1991). These critical scholars and practitioners, questioning positivistic science and the modern movement postulates in architecture, have begun to reformulate their heritage of objectivity and functionality. Collaborative learning has been one of the options revisited to counteract “the tendency of educational research projects to be dominated by the foundational (usually referred to as ‘cognitive’) understanding of the nature and authority of knowledge” (Bruffee, 1993, p.7). This author contends that research on collaborative learning, is biased by foundational assumptions,

It tends to distort the collaborative process itself in a foundational direction, confusing for example, collaboration among peers (students) and cooperation between non-peers (students and teachers) classifying both as a form of hierarchic relationship between apprentice and master. And it tends to explain its results incoherently, masking its explanatory limitations with educationist bombast (‘enriched learning,’ ‘rich engagements, “robust understanding’) (Bruffee, 1993, p.7).
In this present decade, within a renovative spirit, constructivist and qualitative researchers favor a different, less ambitious approach to knowledge building (Baxter-Magolda, 1992; Bogdan & Biklen, 1992; Merriam, 1988; Stake, 1995). These scholars favor partial accounts of facts and not the search for generalizable theories in order to have deeper understanding of problems. How this vision will affect architecture education will depend not only on the ideas that can initiate the process of change, but also on the socio-cultural conditions that would allow or impede these changes. In this section, I will review antecedents and examples of the varied contributions that encourage modifications in such direction.

The productive relations between social sciences and design, as discussed in the first section of this chapter, could be attributed to the merging of two groups of conditions, the historical context in which these relations evolved and the rationale that served as a theoretical platform. The 60s was a socially liberating time, characterized by a world-wide movement for human rights and anti-colonialist struggles for equal interchange policies in peripheral countries of the capitalist system. Environmental concerns grew within US and European industrialized countries. The revival of the US consumer movement paralleled the evolution of environmental concerns. At the same time, the feminist movement began to develop different fronts of academic research as support for its claims toward equality in societal relations.

The objectivistic paradigm was the theoretical platform dominating the academic realm, and disciplines had strict boundaries for themes and research methods used. The awareness of the complexity of the problems mentioned and the limitations of disciplinary boundaries pushed forward interdisciplinary research collaborations. The struggle for social scientists to be recognized as scientific also influenced methods and problems which were to be addressed. Among social scientists, behavioral psychologists headed this search for recognition and produced tangible results applicable in architecture. This fact had a double effect, both in the development of interdisciplinary connections and in the forming of the person-environment relations field, as advocated by Rapoport (1969) and Sommer (1969). The behavioral predominance
overshadowed the qualitative possibilities of ethnographic research that could also be useful in the analysis of architecture-related issues. On the one hand, in the academic realm behavioral investigations were thought to be the only alternative to obtain valid data applicable for architects (Lang, 1987). Yet, on the other hand, in the real world of practice, architects found it very difficult to create a new phase in their design process that could allow for the application of investigation results. Who would pay for the increased cost of projects and was it really worth the extra time and money to finance data that, unlike structural calculations, for example, could not prove complete reliability?

Social Design and Social Architecture

Social design, emerging as an interdisciplinary field at this time, is contrasted with the consumer movement by Sommer (1983), who points out their differences in methods despite their common goals. While the consumer movement was a grass-roots, action-oriented movement trying to intervene directly in the marketplace, social design was generated in academic settings and intended to influence professional practice. The objectivistic rationale supporting social design is evidenced by the following argument: “[d]ue to its roots in academe, social design remained apolitical” (Sommer, 1983, p. 167). This political disengagement, according to Sommer, has helped social design’s development as a field in that it has not been targeted as a politicized enterprise. Nevertheless, he also warns about the danger that

Social design will remain exclusively an academic enterprise whose influence is restricted to universities. Time will tell whether professional education and research without politics (social design) or politics and legislation without research (consumer movement) is the more successful strategy for improving product quality and increasing accountability within industry and the professions (Sommer, 1983, p. 167).

The present situation of objectivistic social science and participatory approaches in architecture and social sciences parallels in certain ways the divergence of strategies between social design and the consumer movement in the 60s. Objectivistic social scientists propose that professional education and research can and should be developed without political attachments. On the opposite side, critical researchers and
feminists scholars think that social issues being investigated cannot be addressed without political awareness of the ideologies imbedded among societal groups. Moreover, they feel that political convictions will inevitably tint our views about research and education despite declarations of objectivity or neutrality.

Social design (Sommer, 1983) and social architecture (Hatch, 1984) share the same historical roots, but while social design has assumed an academic, safe retreat from political involvement, social architecture has tried to be more oriented toward political action and social change. Social design, as well as its related person-environment relations field (Lang, 1987), is based on behavioral science research and is mostly oriented toward the development of knowledge for advancement of the field.

To think about architecture in relation to its users is not a trend which only emerged in the 60s. These ideas can be traced back to scholars interested in exploring problems of life in cities (Jacobs, 1961; Mumford, 1951). These authors were voices of a larger movement toward the humanization of cities and buildings who were concerned with the incorporation of users' values into the planning and designing process. Both Jacobs and Mumford recognized the designers' responsibility toward the people who were affected by their work. Nevertheless, almost two decades passed before some architects and architecture schools became interested in exploring the interdisciplinary possibilities between social science and design that had been opened by Festinger's (1950) initial behavior-space research at the end of the 40's.

In practice, paradigms held by social scientists constructed different paths, depending on their value systems or on the need to comply with scientific requirements. Scholars disagreed on fundamental questions, such as the type of information which should be obtained or what needed to be learned from users. Also, relations between architects and social scientists were not easy ones; they differed in language and expectations about information valuable for design purposes. Architects wanted concrete recommendations that could lead them to the design of forms, while social scientists were less clear as to which information could be valuable or how to obtain it, if possible (Sommer, 1969).
Social design was one of the experiences built upon the expectations of scholars in constructing a new interdisciplinary field. Its major theoretical influences came from ecology and humanistic psychology. Social design advocates wanted to distinguish it from conventional design practices. Sommer (1983) made a list of key differences between social and formalistic design practice adapted from Mark Francis, a landscape architect doing participatory design of neighborhood parks.

Social designers, even though they assumed the “non-political” position of the field, were humanists supportive of the world-wide human rights movement. To form part of the construction of the built environment was a way to participate as professionals in this humanistic movement. This is also why, despite Sommer's (1983, p. 167) declarations of neutrality, in his view, social design has been perjoratively categorized as political by the mainstream objectivistic professionals. Environmental activism included, in addition to environmental protection, zoning regulations and other policies directed toward quality of life issues. The improvement of the conditions of the poor in the United States coincided with the struggle of developing nations against colonialism and for economic justice (Sommer, 1983). In this way, professionals linked with design, construction, and city planning began to imagine ways in which their contributions could be made.

Behavioral scientists enriched psychological constructs already developed through their work with planners and architects on inner city renovations, public housing, mental hospitals, geriatric, and facilities for people with disabilities. Addressing misfits between people and their built environment required changes both in society as a whole and in the way planning and construction processes were done. Among the tasks social scientists undertook were the determination of user needs prior to building, consultation during the building process, and the direct participation of users (Sommer, 1983).

Social architecture differs from social design in members' political participation and their challenge to architecture practice as object-centered design. At the same time, social architects (unlike social designers) are more oriented to the design and building of physical spaces. This architecture branch has been articulated as an interdisciplinary
professional response to the needs for social change. Its knowledge base has been built upon the research of anthropologists, psychologists, and socio-psychologists. Among the scholars pointed out by Montgomery (1989) as the better known contributors to social architecture's development were the anthropologists Anthony F. C. Wallace (1952) and Edward T. Hall (1959), sociologists Leo Kuper (1953) and William H. Whyte, Jr. (1954) and, with a different sociological perspective, Erving Goffman (1959), the psychologist Roger Barker (1968), and social psychologist Robert Sommer (1969; 1983).

Breakthrough texts based on research done in the 50s and published during the next decade served to formulate the premises of the field. Among these were The Hidden Dimension (Hall, 1959), Environmental Psychology (Barker, 1968) and Personal Space (Sommer, 1969). I believe these publications have been the ones with the most impact in the architecture community for their concrete examples about spaces in relation to people's behavior.

Despite the difficulties confronted by architects in integrating social determinants into the construction of spaces, there have been successful projects relying on a different architecture paradigm. In addition to the successful participatory experiences described by Sommer (1983), a wide review of projects done by social architects has been done by Hatch (1984). Twenty-six participatory projects from 12 countries are described in which architecture has served as an instrument for transforming both the environment and the people who live in it. Participatory projects linked with educational design projects have had little diffusion, although, thanks to the initiative of critical pedagogues and feminist scholars (which will be reviewed further in this section) we have known about progress in this sense in the last two decades.

Humanistic Psychology and a New Vision for Pedagogy

The introduction of humanistic psychology (Fromm, 1959; Maslow, 1959; Rogers, 1959), within behaviorist-oriented psychology, was a major change during the sixties. The educational realm, in close relation with behaviorist theories, was also affected by
this new way of looking at human conduct. Humanistic psychologists entered as a third force between psychoanalysts and behaviorists. They acknowledged the role of the unconscious in human behavior as did the psychodynamic approach, and they also believed in individual change through therapy. Yet humanistic psychology differed from behavioral and psychoanalytic therapy in that it was a more egalitarian and interactive approach. Though centered on the person as “client,” they were not patients to be cured. The focus was on achieving awareness of the individual’s interaction patterns within relations (family, work etc.) without ignoring the contributions of past experiences to the actual situation (Feldman, 1993).

Two premises of humanistic psychology particularly influenced educational thought toward the building of a different knowledge paradigm. These were (a) the more egalitarian relationship between the psychologist and the patient, whereby the patient is thought of as a client and the psychologist as a facilitator of the client’s process toward awareness of her/his own dynamic (b) the change of focus from solely the individual to his/her relational context, looking at her/his interactions in the different spheres of life (Landau, 1987).

These two premises were translated into education by humanistic psychologists such as Rogers (1969; 1959), who was interested in developing new educational and research paradigms in this direction. Thus, client-centered therapy was followed by student-centered education and non-directive interviews developed by Rogers for his client-centered therapy. New types of educational settings were created under the premises of student-centered education and there was increased interest in investigating interactions and communication in classrooms. English open education experiences were also valuable contributions in this alternative education movement. In the young creativity field, these ideas resonated with research results indicating that to foster creativity it was necessary to create a propitious climate for teachers to be facilitators more than knowledge transmitters. Among the humanistic psychology scholars who influenced the educational community besides Rogers are Maslow (1959; 1962), Lowenfeld (1962), and Stein (1962).
The research approach and final content of The Papers (Porter & Kilbridge, 1981), reviewed in Section II, seems to have been influenced to some extent by the humanistic perspective. It is interesting to see the contrast between the qualitative approach used to collect the data and the different responses from the scholars who wrote the compiled papers. In general, the results reflected serious problems with the educational dynamics of design studios. Among the responses, Argyris (1981), as an organizational expert, designed an alternative communication model in which instructors could change patterns which seemed to interfere with the teaching-learning studio process. He encountered obstacles which were impossible to overcome, due to the limitations of the proposed behavior modification model in the context of design studios. In my opinion, one of the problems Argyris had was that he did not acknowledge the significance of the existing master-apprenticeship dynamic which dominated the communication pattern in studios. Because underlying premises and values were not questioned, it was not feasible to make any changes in the communication patterns whatsoever.

Creativity concepts, reviewed in Section I, which were related to personal characteristics, products, or processes were expanded by humanistic psychologists. Some, such as Maslow (1959) and Rogers (1962) see the creative process as part of the human potential development of the person, and assume that reality is socially constructed, while others, such as Stein (1962), describe creativity as an intra and interpersonal process. Landau (1987), speaking from her existentialist perspective in psychology and as educator, considers that “creativity is for [her] the goal of every educational experience and of every psychotherapy. In [her] opinion it represents the highest degree of mind health and of the intellectual and artistic functions” (Landau, 1987, p. 10). Her approach has roots in the existentialist theories which explain the motivation toward creativity as the tendency of the individual to self-actualization. Rollo May (1959) thinks creativity “is the encounter of the intensely conscious human being with his world” (May, 1959a, p. 68).” May, Maslow (1959; 1962) and Rogers [ , 1959 #181; 1969 #71]
also believe that the creative impulse leads to self-actualization in a determined direction, all of which is personal development and psychic health.

These humanistic contributions were branded as idealist by mainstream educators and their initial counter-current proposals had difficulty in succeeding. I can probably agree with their detractors in the idealist labeling, not because of their humanistic goals but because of these scholars' desire to push educational structural changes in a terrain unprepared for such a transformation. Assuming a contextual perspective, I argue that in the 60s scholars, humanistic or not, were all immersed in the objectivistic paradigm of scholarship, and overlooked the power of underlying attitudes and beliefs translated into political choices. Thirty years later, these "idealistic" thoughts will resonate with a new group of scholars.

In the 90s, feminist scholars, critical pedagogues, and social architects understand more clearly how politics is part of the equation of change. Their work reviewed in the next section show how they have learned that academic choices are political choices which form part of their socio-cultural context. This is one reason why approaches for meaningful changes in design studios coming from these professionals tend to include political commitment toward social change. In the next section of this chapter these recent works will be discussed.

Thoughts from experienced scholars convey two messages applicable to architecture education, and in particular to design studios. The first of these is the idea that design pedagogy is not only a teaching mission but is the more complex task of facilitating students' creative development and empowerment as persons (Groat & Ahrentzen, 1997; Weisman, 1996b). Second, the same scholars remind us of the difficulties and responsibilities of teachers in studios (Weisman, 1997).

Paradoxically, a broader vision of studio goals will bring us back to the reality of the design studio, with its limitations in time and scope. How could studios be organized, if thought of as the initial phase in a life-process in which students begin developing their creativity? On the other hand, if we look at students, they do not come to the studio as
blank slates—quite the contrary. Most commonly, they have been conditioned negatively toward the development of their creative potential by some of their educational experiences. How are instructors supposed to counteract this past or to stimulate creativity despite students' creative handicaps?

Besides students' personal conditions instructors in studios must guide students in the contradictory process of “destruction-creation” necessary to build new design ideas. I see a teaching-learning process inspired by this creative process dilemma recounted by Picasso (Landau, 1987, p. 84). Students draw from their previously accumulated experiences or images to produce their designs. This knowledge will serve as a starting draft which has to be destroyed to create something new or different. Among the other tasks design educators have, besides teaching the technical know-how, is to help students deal as well with the destruction-creation paradox at the personal level. Students must elicit their socio-cultural experiences, while at the same time be willing to destroy their restrictive boundaries in order to innovate. As I see it, this destroying-creating experience goes beyond the act of designing, to include students' struggle to stretch their psychological and cultural frontiers.

**New Perspectives in the Nineties for Architecture Education**

In response to prevalent higher education guidelines and architecture practice, different groups of professionals have come up with alternative approaches to architectural education. Some have been inspired by principles of equality and social responsibility in the construction of urban spaces. Others have focused on college level pedagogy diverging from the predominant educational tendency.

Among education scholars Baxter-Magolda (1992), Shor (1992) and Bruffee (1993) have developed work corresponding to the lines of thought of the architecture pedagogues mentioned above. While Baxter-Magolda investigates college students' intellectual development, Shor and Bruffee, also based in constructivist theories, propose guidelines for student's empowerment and social change through critical teaching and collaborative learning.

This initial classification does not account for the variations in the work of a particular researcher nor does it include other scholars who do not clearly belong to any of the groups. To the extent possible, I'll explain these distinctions in the review that follows. The renewed interest in exploring architectural issues from a critical perspective has enriched architecture education discussions, especially of pedagogical and ethical issues. These works have come not only from architecture professors such as Dutton (1991a; 1996), Ward (1991; 1996), and Crysler (1995), but also from professionals with training other than architecture, such as Gutman (1988), Boyer (1996), Cuff (1989; 1991), Groat (1993a; 1996; 1997), Ahrentzen (1993; 1996; 1993a), and Anthony (1991). All these authors have done some graduate work in architecture or have collaborated with architects, and despite their professional differences, their studies are characterized by a depth and spirit of educational change.

Studying architectural practice with an anthropological perspective, Dana Cuff (1991) claims that architecture both relies upon and exceeds individual creativity, which she considers to be a social construction. She believes that architecture history gives us a dual picture. On the one hand, buildings are considered society's cultural heritage and a reflection of our collective concerns. Yet at the same time, she points out that, “[architecture historians] are typically reluctant to suggest that buildings might have been born from a collective conception” (Cuff, 1991, p. 5).

Cuff's in-depth examination of architecture practice contrasts the “autonomous architect-hero myth” of the outsider's vision with the architecture practice of the everyday world of work. She finds that “opportunities for architects to create without external interference are virtually nonexistent” (Cuff, 1991, p. 4). Furthermore, she explores how
“architecture practice emerges through complex interactions among interested parties, from which the documents for a future building emerge. This I never learned in school” (Cuff, 1991, p. 4).

Cuff's work connects us with the way the teaching-learning design process has been addressed in architecture schools. In most architecture programs and experiences the “what and how” of teaching design has been inspired by an idealized architectural practice. Issues such as collective work and designs in real contexts, among others, are thus seldom included as part of the curricula. The emphasis is on achieving a final product through a process faintly related, in the best of cases, to real situations. Students are encouraged to produce novel forms, responding mainly to instructors' challenges. These projects are simplified, removing economic or urban planning determinants that would pose heavy restrictions in designing a real project, sometimes being transformed only into a formal aesthetic challenge.

Cuff's study, along with those of Gutman (1988) and Larson (1993), together give us an up-dated critical vision of architectural practice. These texts could help guide the design teaching-learning process towards the preparation of students for a more contextual approach to architecture.

Gutman's (1988) classic text unites his sociology background with his teaching practice with architecture students. He gives a sympathetic view of the architect's artistic domain endangered by the growth of the construction industry and suggests measures to cope with the profession's marketing needs. Also, he offers quite a somber picture of the excessive number of graduates in relation to the amount of work available.

Whereas Gutman focuses more on the economics of the construction industry, the merit of Larson's book (1993) in this trio of authors lies in its contextualization of the profession in light of social and economic changes. Although Larson and Cuff's texts complement each other, Larson's work does not have the same level of articulation between ideological discourse and the data presented. These two texts, however, could not be categorized as feminist (especially Larson's, which endorses the
architecture “stars” she seems to critique), but they share a female outsider's viewpoint of a profession heavily driven by egocentric “artistic” males. Larson talks about architects’ struggle with the conflicts between professional legitimacy and aesthetic stardom, including an analysis of the “symbolic reward system” that the profession has created. She concludes that the architecture professional award system, currently oriented toward image marketing, has lost its supposed goal of guiding the profession to the “best” in architecture. The inclusion of disparate choices for awards makes the actual architectural discourse confusing and disorienting for the profession as a whole.

These three studies linking architecture practice with architectural education stress issues that have been emphasized by the Boyer report (Boyer & Mitgang, 1996) already discussed in the second section of this chapter, by Groat's (1997) latest report about faculty women in architecture and by Fisher's (1994) call to save the profession. In my point of view they all reflect on the need for architectural practice to redefine its insertion on society and to reach for interdisciplinary connections with other disciplines. If these approaches for changes are assumed, architectural education must also transform itself towards the recognition of its social constructed nature. This will mean addressing communication issues in their different levels, from team-working skills to expanding knowledge boundaries through interdisciplinary connections. In this way architectural education could certainly complement the changes required for the profession to be saved, as expressed in Fisher's article title (1994).

Constructivist Theories and Students' Voices

The conclusions of Baxter-Magolda’s (1992) longitudinal research on college students, while not conducted specifically with architecture participants, illuminates our comprehension of students' experiences in studios. Besides the theoretical contribution of this study, Baxter-Magolda shares her paradigm shift from an initial positivist-oriented research to a qualitative perspective supported by students' testimonies.

...[T]he limitations of quantifying students' ways of knowing became clear to me. Organizing students' stories into categories and themes was a useful process through which to obtain a better understanding of how they view the world.... My
shift from assumptions of objectivity, generalization, and cause-effect relationships to assumptions of subjectivity, context-bound, and jointly shaped relationships led to my pursuit of feminist writers' discussions about gender (Baxter-Magolda, 1992, pp. 15-16).

Baxter-Magolda's field of inquiry has been intellectual development and gender in young adults. She describes four ways of knowing and their development in college students through an epistemological reflection model, based on students' perceptions of the nature of knowledge. Her research is guided by the notion that a deeper understanding of the way students learn will enable instructors to teach more effectively. Her guiding assumptions were: (1) ways of knowing and patterns within them are socially constructed; (2) ways of knowing can be best be understood through the principles of naturalistic inquiry; (3) students' use of reasoning patterns is fluid; (4) patterns are related to, but not dictated by, gender; (5) student stories are context-bound; and, (6) ways of knowing and reasoning patterns within them are presented here as patterns in Frye's (1990) terms (Baxter-Magolda, 1992, pp. 20-23). She clarifies this concept as follows:

[P]atterns are constructed from communication in which people uncover the events of their lives...Frye describes this process as one of opening up possibilities rather than drawing conclusions because the interaction creates new situations that alter the pattern being constructed...Thus, patterns can be used to make sense of experience but stop short of characterizing it in static and generalizable ways (Baxter-Magolda, 1992, pp.16-17).

These findings support theoretically both the shared experiences of an architecture undergraduate (Willembrock, 1991) and one of the case studies (Simmonds, 1981) from the Architecture Education Study. Some of these findings also relate to the results of the pilot studies I did in Amherst and Caracas (Diaz, 1997b).

The major findings of Baxter-Magolda's study (1992) regard (a) students' epistemological development (their ways of knowing), and (b) educational practice (barriers to the use of new approaches within the realities of higher education and relational knowing as the key to transforming education). There are two findings related to students' epistemological development. The first is that "two parallel reasoning patterns cut across most ways of knowing," referring to the three phases of students' developmental picture which she names "absolute knowing, transitional knowing and
independent knowing". These reasoning patterns "are equally complex ways of making meaning of experience" (Baxter-Magolda, 1992, p. 367). "Patterns simply represent different learning preferences and behaviors that stem from the basic assumptions used to make sense of experience" (Baxter-Magolda, 1992, p. 369). The second is that "the two parallel patterns relate to, but are not dictated by, gender...No pattern was used exclusively by women or men...some students combined the two approaches in different domains of their thinking or used one pattern within one way of knowing and another during the next (Baxter-Magolda, 1992, p. 369). (See Baxter-Magolda's Epistemological Reflection Model in Appendix G)

Connecting this model with architecture design education, I found that Beinart (1981) presented three schemes of the relationships among teachers and students that roughly correspond to Baxter-Magolda's patterns. Beinart's models of learning relationships were described as (a) teacher as a mediator between student and knowledge (equivalent to Baxter-Magolda's absolute knowing) (b) triangular relationship (equivalent to transitional knowing) and (c) student's independent contact with knowledge consulting with the teacher when needed (equivalent to independent knowing). Beinart asserted that architecture design education more often fits the first of these models. He further observed that design education could usefully encompass all three alternatives "in a sequence from the first to the third, with the teacher playing the largest role in the first or initiation year and his/her role diminishing as the student acquires independent access to knowledge" (Beinart, 1981, p.221).

Baxter-Magolda (1992) adds a new level of complexity to understanding the learning process in studios as seen through Beinart's models. The learning preferences cutting across both Baxter-Magolda's developmental stages and Beinart's models are an important condition that design instructors must take into account. These reflections and others (Gardner, 1983) which explain differences in learning styles, demonstrate that students do not have to fit in a universal developmental model. They can succeed in any one of their different ways of knowing (Baxter-Magolda, 1992), intelligences
(Gardner, 1983), or models (Beinart, 1981), if their learning differences are understood by
the instructor.

Baxter-Magolda affirms that students' "[p]osition viv-à-vis authority affects the
transition from certainty to uncertainty" (1992, p.370). Power issues in studios have
been addressed by critical pedagogues (Crysler, 1995; Dutton, 1991b) and feminist
scholars (Ahrentzen, 1996; Anthony, 1991). Historically, the case studies from the
Architecture Education Study (Porter & Kilbridge, 1981), and more recently, findings from
my pilot studies (Diaz, 1997b) indicate how students' attitudes toward authority vary
and so do the consequences for their learning process. As in Baxter-Magolda's
investigation, in my pilot studies the more capable students tended to identify with
authority to a greater degree than the less competent students. Studio power issues,
derived from the master-apprenticeship system, were of great impact to most of the
students from Amherst and Caracas.

Baxter-Magolda's (1992) analysis separates power issues from gender issues.
Her picture, looking closely at students' intellectual development, does not include the
socio-cultural frame of reference that could modify students' learning patterns according to
their gender socialization. Thus, Baxter-Magolda's (1992) findings refer to equality in the
intellectual development patterns among genders. This particular focus did not allow her
to perceive any gender conflicting issues or differences with female students.

In relation to architectural education, using a more contextual perspective, feminist
scholars (Ahrentzen & Anthony, 1993a) introduce some contradictory elements into
Baxter-Magolda's reflection. Although, the purposes of the studies of Baxter-Magolda
and Ahrentzen & Anthony were different, it is important to consider certain aspects which
are missing in Baxter-Magolda's developmental picture. In my pilot studies (Diaz,
1997b) I found, corroborating the feminist view, that gender socialization and design
studios' gender dynamic play an important role in studios' learning environments,
inhibiting female students' capability of developing their design voices in some cases.
Another important finding from Baxter-Magolda's study is that "[c]onnection or relational aspects of knowing, may be the key to complex forms of knowing", suggesting as well, that autonomy and connection are both required for complex forms of knowing (Baxter-Magolda, 1992, p.373). In my opinion, this finding contradicts the prevalent objectivist knowledge paradigm with its implications in studio pedagogy in which autonomy is preferred over connection. Also, this places an emphasis on the role of group dynamics and collaborative approaches to enhance students' learning process. Students from the pilot studies expressed, in different forms, their need for connection with professors and peers, as an important supporting bond in their studio experience.

Baxter-Magolda's findings (Baxter-Magolda, 1992) related to educational practice (which referred to curricular and co-curricular educational settings) focus on the validation of students as knowers and the implications of this principle in their empowerment as constructors of knowledge. I found that what Baxter-Magolda affirms in this aspect connects with postulates of critical pedagogues and feminist scholars working in architectural education. For this reason I have decided to include her findings with the feminist and critical perspectives in the next section of the chapter.

**Feminist and Critical Perspectives on Architectural Education**

Among feminist scholars (1996; Ahrentzen & McCoy, 1996; Weisman, 1996b) and critical pedagogues (Crysler, 1995; Dutton, 1991c; Ward, 1991), I found great similarities in general purpose and methods, despite the primary feminist emphasis on women's issues and critical pedagogues' interest in the struggle for social power. Some of these researchers (Ahrentzen, 1996; Ahrentzen & Anthony, 1993a; 1996; 1993a; Groat, 1993b; 1992; 1996a; Weisman, 1996b) shared both sets of motivations, resulting in a great variety of contributions due to each authors' focus and specific goals. The main themes include (a) understanding power issues imbedded in social, professional, and educational realms (Agrest, 1996; Crysler, 1995), (b) investigating specific issues such as genderization (Ahrentzen, 1993; Ahrentzen & Anthony, 1993a) and diversity (Ahrentzen & McCoy, 1996; Grant, 1991; Groat, 1993a) in architecture education, among
both students (Groat & Ahrentzen, 1996) and professorial staff (Groat & Ahrentzen, 1997), and (c) reports on architectural courses (studios, seminars and lecture courses) (Ahrentzen & McCoy, 1996; Dutton, 1991c) reflecting these feminist and/or critical perspectives.

From a critical pedagogy perspective, Dutton's (1991) edited volume, *Voices in Architectural Education*, includes essays challenging architecture's decline in significance and in its power for social and cultural transformation. Some of these articles offer pedagogical alternatives to traditional architectural education, including the examples described by Feigenberg (1991), Grant (1991), Kinsley (1991), Leavitt (1991) and Ward (1991). Five years later, in another compilation edited by Dutton and Lian Hurst Mann (1996), architects are encouraged to reassess critically architecture institutions.

How architects construct an understanding of the social world and how that construct affects possibilities of practice are pivotal concerns for architects who seek to challenge the status quo, construct new social formations and new identities and help reconstruct a viable democratic public life in the face of inexorable forces driving economic growth, destroying global ecology, homogenizing culture, and privatizing the public realm. These questions frame our point of departure for reconstructing architecture in the current period (Dutton, 1996, p.1).

Crysler (1995) also critiques the transmission model of education which currently dominates architecture training. He presents critical pedagogy as an alternative model of educational practice. Nevertheless, he cautions us against versions of a pedagogy of "cordial relations" that erase historical interconnections and conflicts between groups. Elizabeth Ellsworth is quoted as pointing out that "critical pedagogy can thus become synonymous with a form of consciousness therapy administered to the 'voiceless'.... Thus, teacher-orchestrated empowerment and dialogue can give the illusion of equality while leaving the authoritarian nature of the traditional teacher-student relationship intact" (Crysler, 1995, p. 213).

Weisman (1992; 1996a), in turn, offers "a feminist analysis of the man-made environment as a form of social oppression, an expression of social power, a dimension of history and a part of women's struggle for equality..." (Weisman, 1992, p.3). Her
framework not only elicits questions never addressed before by architectural critics or historians, but also reflects on architectural education and practice (Weisman, 1996b).

Space, like language, is socially constructed; and like the syntax of language, the spatial arrangements of our buildings and communities reflect and reinforce the nature of gender, race, and class relations in society. The uses of both language and space contribute to the power of some groups over others and the maintenance of human inequality. (Weisman, 1992, p.2).

Weisman's work as a researcher is coherent with the ways she is constantly experimenting as a studio professor, incorporating community service and collaborative methods for a more diverse, ecologically responsible and empowering learning process for students. Some of Weisman's studio experiences which have been commented upon by other scholars (Ahrentzen & McCoy, 1996; De Luca-Dicker, 1993; Mitgang, 1997; Weisman, 1996a) will be discussed with greater elaboration further on in this work.

Ahrentzen and Anthony (1993a) report on genderization in architectural education in the context of studio practice. Their research not only reveals the prevalence of undesirable situations for female students in studios but suggests practical ways in which studio experiences can be restructured to guarantee better opportunities for both women and men. Willembrock's (1991) and Diaz, Buss and Tircuit's (1991) experiences as architecture undergraduates reflected similar concerns on some of the issues addressed by Ahrentzen and Anthony. Using a different approach, Anthony (1991) contrasted students, juries and practitioners' opinions about juried design reviews. In addition to her investigation of studio rituals and other complementary aspects of the studio experience, she offered students and educators suggestions for improving or changing these evaluation practices. Ahrentzen (1993; 1996; 1993a) has been particularly interested in exploring social interactions that constitute gendered practices in design studios. She argues that gendered education occurs in the following three arenas: "(1) the substance of what we teach, and how we choose and frame it; (b)[sic] the social relations of the learning environment itself, and (3) the attitudes, approaches, and collective identity of the field" (Ahrentzen, 1993 p. 382).

Groat and Ahrentzen (1996) investigated "the ways in which both the content and the form of architectural education might impede or support the progress of women
and minority students.” In particular they focused on three aspects of the ‘hidden curriculum’: studio pedagogy, social dynamics, and ideals and expectations” (Groat and Ahrentzen, 1996, p. 166). The concept of hidden curriculum was explored by anthropologists studying education in the early 1950s (Bogdan & Biklen, 1992). Philip Jackson (1968), cited by Bogdan & Biklen, conceptualized it as “the implicit rather than explicit messages of socialization that schools give to children” (Bogdan & Biklen, 1992, p.19). Thomas Dutton (1991b) also applies this concept to explain the power dynamic in design studios.

A recent article reports the findings of Groat and Ahrentzen’s (1997) study of faculty women in architecture. Their study found that creating a basis for collaboration, facilitating communication, and having a caring attitude toward students as important pedagogical principles of the faculty women they studied.

As I mentioned in an earlier section of this chapter, Baxter-Magolda (1992) had a number of findings that relate to educational practice and which are consistent with the work of critical pedagogues and feminist scholars. Baxter-Magolda stated that "validating students as knowers is essential to promoting students' voices" (1992, p. 376). In studios, students face learning experiences that could threaten their integrity and self-esteem. In my opinion, changes in studio teaching need to start with an attitudinal modification on the part of professors, as influential figures in the actual system, toward acknowledging and reaffirming the value of students' ideas. Baxter-Magolda found that "situating learning in the students' own experience legitimizes their knowledge as a foundation for constructing new knowledge" (Baxter-Magolda, 1992, p. 378). I believe authentic expression is critical for creativity and innovative ideas in design studios. Thus it is imperative to validate students' previous experiences. Ignoring them is in many cases detrimental to their creative process or at least hinders possibilities for more creative achievements.

In addition, Baxter-Magolda stated that “defining learning as jointly constructing meaning empowers students to see themselves as constructing knowledge” (Baxter-Magolda, 1992, p.380). By assuming that the design learning process is part of
students' construction of knowledge, we add another dimension to what is learned in
studios. Contextualizing design projects provides more productive and gratifying
experiences both for professors and students as was acknowledged in my pilot studies
(Diaz, 1997b). Baxter-Magolda concluded that "the relational component evident in all of
these three findings is essential to empowering students to construct
knowledge" (Baxter-Magolda, 1992, p. 382).

If Baxter-Magolda's diagnosis about the negative effects of our prevalent
educational model separating the personal lives of students from the academic process
is united with the particular characteristics of design studios, I believe that negative
consequences increase. The emotional tone employed by students and the reiteration of
the effects the design studio's regime had on students' lives was one of the important
findings of my pilot studies (Diaz, 1997b). Studio demands, compared to other majors or
graduate studies, isolates students even more and, in many cases, greatly disturbs their
lives. Students' capacity to relate outside of their close academic circle is diminished. This
affects their personal lives and, I think, also impedes the development of their potential
to be contextual knowers.

Along with feminist scholars and critical pedagogues, social architects critique
mainstream architecture practice. Social architecture has already been mentioned in
comparison to the field of social design. Social architects characterize themselves as
having a philosophy opposite to that which guides conventional architecture practice. In
addition to applying participatory methods through the design process, this radical
branch of architecture, along with feminist educators and critical pedagogues, has
produced innovative educational experiences consistent with their ethical principles.

In addition to teaching the technical "know-how" needed to develop projects,
architectural pedagogues with alternative educational philosophy, have found it
essential to introduce students to social ethical questions of architecture practice. This
has been accomplished through encouraging critical thinking in the developing of their
projects and organizing community based studios, sometimes even directly participating
These educators believe that students should at least be exposed to critical perspectives toward the architecture profession's goals and values with respect to society as a whole. Students should discuss issues of power and inequality in city spaces and propose alternatives for change at different levels of action in architecture practice. Also, these educators consider that students are wrongly taught an individualistic approach to architecture practice, which does not correspond to what happens in real professional life. In this sense, they advocate design studio team work and participatory projects with users to offer students real experiences that would be more fruitful for them in the long term (Cuff, 1991; Dutton, 1991a).

Diversity issues in architecture education, commented upon by Grant (1991) and Diaz, Buss and Tircuit's (1991) were formally addressed in the 1995 AIA/ACSA Teachers' Seminar entitled “Designing for Diversity”. From this meeting emerged a monograph that joins profiles of efforts to address and incorporate issues of diversity within various architectural courses (studios, seminars and lecture courses) (Ahrentzen & McCoy, 1996). This undertaking adds to the work already mentioned (Dutton, 1991c; Welch, 1995) in reaching out to establish a professorial dialogue on pedagogical ideas, methods and applications to foster an architecture education of inclusion and participation.

These many contributions fit as pieces of an ongoing puzzle guided by the intention of illuminating issues that would best benefit changes in design studio pedagogy. The research developed in the last two decades by social scientists contrasts with the studies done within architecture education, which is somewhat isolated from other disciplines. At the same time enriching the architectural education literature, we observe the abundance of research coming from feminists and critical pedagogues. Diversity and gender, issues absolutely ignored two decades ago, are now brought forward for analysis requiring different methodological approaches to adapt to these perspective changes. These alternative s are encouraging interdisciplinary collaborations, already initiated by social architects and creativity theorists, to advance what we already know about studios.
Integrating this research puzzle with data coming from real design studios has made it possible to build “ladders and bridges” in Geddes’ words. The interviews with students and interchange with professors through the pilot studies made these pieces of writing come alive. Having shared studio experiences with students who were struck, exhilarated, or wounded by studio experiences, thus renewed my commitment to educational change. The case study I have chosen will illuminate and open possibilities for better design studios.
CHAPTER III
METHODOLOGY

Purpose of This Case Study

My intent in conducting this study was to help understand students' and their professor's studio experience by learning about one design studio deliberately operated with a student-centered approach within cultural feminist principles. I wanted to explore how the professor's pedagogical and political beliefs informed the studio dynamic and how students responded to her pedagogy. I found that the best approach to reflect both my intentions and research objectives were to apply a qualitative methodology and a social-constructivist theoretical framework.

Pilot studies I have done (Diaz, 1997b) corroborate many of the problems pointed out by the scarce literature on design studios. Among the great number of design studio courses which are oriented by the predominant architectural ideology, there are divergent initiatives using a critical constructivist approach. These alternative experiences have a wide range of goals, methodologies and project themes. This study aims to explore students' experiences in a design studio guided by Professor Leslie Weisman of the New Jersey Institute of Technology (NJIT). She has explored different modalities of studio pedagogy, integrating feminist pedagogical principles in different academic levels and settings ranging from traditional architectural schools to an experimental summer school (Weisman, 1996a; Weisman, 1996b). In the Fall semester 1997, corresponding to my data collecting schedule, she was teaching one of the first semester introductory design studios within the five-year bachelor of architecture program.

Within this case study, my research focus was on the meaning students made of their experience in this design studio and how this connected with the professor's educational philosophy as translated into her teaching strategies. In addition, I was interested in relating students' individual learning processes with their process of
socialization in the architecture culture they encountered during their studies and how this collective process affected their design learning. I chose to observe them in their own “natural” setting, a freshman design studio in architecture. Among the different types and modalities of case studies in the education field, this study can be categorized in two ways.

First, it can be called an ethnographic case study because it “is more than an intensive, holistic description and analysis of a social unit or phenomenon [a design studio]. It is a sociocultural analysis of the unit of study” (Merriam, 1988, p.23) through the lens of feminist pedagogy and critical theory. I was interested in exploring the meaning a professor and her freshman students made of their experiences in a design studio. This meaning was constructed through their sociocultural network. Thus there are two analytical levels intertwined in this case study: the first is a macro-level connecting design studio dynamics to corresponding sociological issues. These issues were centered in clarifying the professor's beliefs about society, pedagogy and architecture education. The second level of analysis is the micro-level of the design studio particulars, basically related to pedagogical and interaction issues, paying close attention to the way the professor's belief system and pedagogy coexisted within the traditional structure of this architecture school.

Another way of categorizing this study comes from Stake's (1995) eclectic view of case studies as drawing “from naturalistic, holistic, ethnographic, phenomenological and biographic research methods” (Stake, 1995, p. xi). Deriving from this pluralistic perspective, his research method focuses on issues while keeping a holistic perspective of the case and is particularly suited for the two analytical levels I used. According to Stake's classification of case studies as intrinsic or instrumental, this case study was an instrumental one since my interest in this particular design studio derived from “a need for general understanding, ...[such] that we may get insight into the question by studying a particular case “(Stake, 1995, p. 3).

I believe that my personal motivations to do this case study had the final word in choosing these research methods. I wanted methods that would allow me to reveal...
issues that were beyond the evident observable behaviors of professors and students. I needed to explore behind the scene in order to clarify the directions for changing design studio teaching. The following methodological guidelines complement these thoughts.

**Conceptual Guidelines**

The conceptual organization of this case study followed Stake's (1995) guidelines, in the sense of anticipating what could be encountered, while being as open as possible to new information. Also, the focus of the case study was organized through issues and issue questions "in order to force attention to complexity and contextuality" (Stake, 1995, p.16) instead of working with hypotheses and goal statements, which can sharpen the focus but minimize interest in the situation and the circumstance. Identification of issues inevitably draws attention to problems and concerns, though the case and issues are to be in the forefront.

The case chosen was a freshman architectural design studio. Since I did an instrumental case study, the issues and research questions I identified a priori based on my pilot studies and literature review (Diaz, 1997a; 1997b) were the following:

1. How does the professor apply her student-centered pedagogy and cultural feminist beliefs in this first semester design studio experience teaching the required design knowledge and supporting students' socialization into the architecture culture?

2. How do students experience this professors' pedagogy and what are the benefits in terms of personal empowerment as creative individuals, development of design skills as contextual knowers and construction of a positive group learning dynamic?

**Role of the Researcher**

My experiences both as an architecture student and as an urban planning instructor of architecture undergraduates gave me an insider's perspective, with associated advantages and disadvantages. In the pilot studies leading to this work, I
had no trouble gaining access and connecting with participants and their experiences, which in many ways are similar to mine. Being conscious that in doing an ethnographic case the data was mediated by my own experiences I was able to detect some of the blind spots that my familiarity with the architecture culture produced. The awareness of these biases encouraged a search into my own professional assumptions and beliefs about teaching--more precisely about the studio dynamic--which are a product of my own experiences as a female architecture undergraduate, graduate student, and professor.

Collecting data for one of the pilot studies in which I used a survey in two different settings helped clarify my understanding of my personal beliefs. Contrasting information from my own workplace and the site where I was doing my graduate work evidenced imbedded feelings and beliefs. I had to sort out information from different countries and discover the common threads of the architecture culture that related them with my own personal experience. This previous work prepared me for my researcher role as a participant observer and an interviewer in this case study.

Selecting the Case and Gaining Entrance

I encountered serious difficulties searching for a pedagogical experience that would challenge the traditional master-apprentice, object-centered design studio. While architectural education/pedagogy issues do not currently receive much scrutiny, alternative pedagogical alternatives are even less visible. Architecture culture prepares architects to express themselves through drawing rather than writing. The research skills and the publication system used by college professors in other fields are largely ignored.

Through personal networking, I finally was able to contact a group of professors who were teaching design studios that complied with my research objectives. I then had to select from this small group of innovative professors those in geographically accessible institutions. A personal condition I had to include was that the setting should be within a reasonable driving distance from my residence to facilitate the interviewing of participants and observation of design studio sessions. The final selection was made
from this small group, based on the personal availability of the professor Leslie Kan
Weisman and the initial rapport I had with her. She was going to be in charge of one first
semester introductory architectural design course in the New Jersey Institute of
Technology (NJIT).

I contacted the professor by phone and she agreed to participate in the study. In
addition to the initial conversation, I learned from published references about how her
work exemplified explorations into alternative methods of the design studio teaching. I
had expected that I could observe a collaborative design studio, but in this semester
she did not teach one, rather she had to teach one of the five first semester groups.

The School of Architecture of NJIT, due to the high number of students, has
several design groups per level. Each level has a coordinator in charge of the general
guidelines for all the groups, taking into account feedback from the other professors at
that level. The design groups share a general schedule, the same design exercises and
common meetings every two weeks to introduce the exercises and present selected
projects at the end of each exercise. Within each of the different levels, studio professors
have the freedom to focus or emphasize the aspects or issues they consider relevant to
accomplish the objectives of the exercise. Thus, Leslie's course dynamic was
developed according to her personal initiative.

Leslie's is inspired by cultural feminist principles with a student-centered
pedagogy. Through her own publications (Weisman, 1992; 1996a; 1996b) and others
commenting on her work (Ahrentzen & McCoy, 1996; De Luca-Dicker, 1993; Mitgang,
1997), this instructor has clearly expressed her teaching commitments. She believes in
the educational importance of addressing through studio work collective processes and
power relationships as a way of encouraging the elimination of social inequities. Among
the teaching strategies she employs are "collaborative learning, sharing of authority and
emphasis on ethical values, respect for human diversity and interconnectedness among
all of humanity, the natural world, and the products of human design" (Weisman, 1996a,
p. 41).
In order to facilitate my entrance as a researcher to the setting, the professor previously informed both her superiors, in this case the coordinator of the first level studios, and the students about my project. Leslie stressed to them the voluntary nature of their participation, the independence and confidentiality of my work in terms of their evaluation. She also guaranteed to them that if in any way, my presence or work bothered them or impeded in some way studio activities, I would not be allowed to continue doing it. In addition, in our initial conversations, she was very cautious about students' well-being, sharing with me her concerns about the group as newly-entered students and that this research could in some ways be detrimental to their performance. My previous experience in architectural settings, I believe, helped Leslie to accept that I would know the best ways to connect with students and eliminate possible negative interferences with their work.

My initial contact with students was through informal conversations before and after studio sessions. Before I started the field work, I discussed confidentiality and report issues and gave to each of the students and the professor a human subjects consent form in compliance with human subjects consent procedures of the University of Massachusetts. This form was approved by them before the research process started. I informed Leslie of my interest in discussing early drafts of the findings with her as well as informing the students about the results of the research (see Informed Consent Documents in Appendix A).

Data Collection

The data collection was done during one academic semester, the usual duration of a studio course. In this particular architectural setting, studios finish a week before the other courses. I deliberately chose to collect the data in the middle and towards the end of the semester. Since this group was a first semester course, students needed some time not only to adapt to college life but also to understand the particularities of a design studio course.
The data were collected through participant observation, interviews, informal conversations and document review of handouts and written materials from the department and professor. I also had informal conversations with other former students of this professor and current students in other professors' studios.

**Participant Observation.** Design studios were scheduled to meet three times a week for 3 1/2 hour sessions through the 14 weeks of the academic semester. There were special sessions (freshman reviews) every two weeks in which professors from each studio presented two or three students' projects to all of the first semester groups. At the end of the semester there was one final public presentation with juries for all of the first semester studio groups. I attended regular studio sessions of this freshman studio for nine sessions during the middle and end of the semester. Also, I observed two of the freshman reviews, a special internal review session of Leslie's group with guest jurors and the final public presentation at the end of the semester, in which two selected students from each studio group presented their work.

Taking field notes was the primary means of recording observation data. However, near the end of the semester, when the students felt at ease with my presence I taped a student small group discussion and desk critiques. I took notes by hand in situ, adding personal feelings or personal opinions as they came up. After each of the sessions I transcribed the notes discriminating the information and supplementing it with my reflections upon events observed and any additional insights or personal feelings that I had while elaborating the notes.

**Individual Interviews.** From the thirteen students of the group, twelve participated. At mid-semester I interviewed all of the participants for approximately one hour. At the end of the semester I interviewed seven of those students. The interviews had a semi-structured format and were guided by a protocol based on the questions listed in Appendix A. The professor was interviewed four times, one of them for one hour and the rest for one and a half hours each. All of the interviews were taped and transcribed. The last of these interviews was conducted by phone after the end of the
semester. Also, I took notes after the interviews about important non-verbal cues and the general attitude of the participant while being interviewed.

Students' first interviews focused on some personal information, motives for entering the program, expectations about it and studio experience up until mid-semester. The first interview of the professor focused in part on some personal facts, academic life, teaching experiences and on her plans for this studio in relation to her teaching philosophy and experience. I asked, in addition, how she saw the progress of the studio thus far and her opinion about the group in relation to other groups she had taught.

The second interviews with both the professor and students were done after the studio work was over, at times convenient to participants. The 9-day lapse between the ending of studio work and the end of semester activities was chosen as the best time to schedule these final interviews. Students and also the professor were then, at least, relieved from the usual pressure of the final design studio presentations. In the second student interviews and the second and third professor interviews, the focus was on a retrospective reflection on the whole design studio experience. In the last interview with the professor I also did an initial member check with drafts of the data analysis I had about the students.

**Document Analysis.** To complement the data collected through observations and interviews, I reviewed the brochures of the school and the first semester design studio materials for this semester. These included the program documents, curriculum and school philosophy, first semester common handouts as well as one specific handout for the three weeks of Leslie's studio activities at the end of the semester. I took photographs of the students and some of their models which I used as personal references when I was analyzing the data.

**Research Journal.** I had the intention of keeping a separate personal research journal while I was doing the observations, but in the process of transcribing the notes I found it more convenient to keep together the observation notes and the personal
reflections, insights and feelings. When I began working with the interview materials, in what I consider as the second phase of the data analysis, I kept another journal as an organizing tool for keeping track of timelines and steps of the process. This journal worked as an expanded agenda in which I also reflected about problems, decisions and insights that made me change directions in the research process.

Data Analysis

The data analysis began parallel to the data collection in the process of rewriting the observation notes. Research journal writing as a personal integrative procedure was used for reflecting on the data after I had finished the field work. The visit to the setting and the first meetings with participants provided a basis for an initial description, demographic profiles and personal information. The information from these initial observations and interviews served as a contrasting picture to my own assumptions and helped clarify biases I held. At the same time, the issues as initially stated were enriched with new ones and were explored in the interviews that were done at the end of the semester. The interviews were the most important source of information for the analysis.

The knowledge obtained from the pilot studies that I had done on students' experiences in design studios contributed to some a priori categories to organize the students' data from observations and interviews. I started a raw classification with items such as interactions, activities, desk critiques, etc. as soon as I had each interview transcribed. After data collection was completed, parts of the transcripts and observation notes were integrated into new categories rearranging the data from the initial categories.

In a second round of data reduction I began searching for common themes among what students had shared. Initially doing this was facilitated by the semi-structured format I had followed for the interviews, but not all of the students emphasized the same issues. This starting point allowed me to have interview transcripts of all students classified in personal data, psychological issues, studio activities, design process, Leslie, peers, college life/program and comments about other courses or comparison with
other professors. I kept outlines of each theme with one phrase of the piece of transcript to maintain the vision of the whole theme.

After having this raw grouping of students' transcripts I began organizing Leslie's interviews. This process was much more complex, as the interviews were not structured, they were longer and Leslie is an excellent narrator. Hence, it was extremely difficult to cut and reduce her data. The complexity of Leslie's personality also made the reduction difficult. I tried several unsatisfactory schemes to organize her data but they served as ways of reducing data very slowly because I did not want to lose important pieces of transcripts. In this phase I also made comparisons between what students said about her and what she said in similar circumstances or about the same issues.

What made me arrive at the final organization of the studio themes, was to do a profile of Leslie in a form which would allow a good connection with students' data and the information about studio activities already processed. This happened after several days of struggle with Leslie's data (interviews, observations and writings) and finding within her discourse seemed to me to be divergent or contradictory objectives. I had the breakthrough of an insight of Leslie's rich personality depicted through three facets to which I could link the three sets of objectives I had found guiding her studio dynamic. Thus, the scheme of the three Leslie's: the feminist, the architecture scholar and the teacher became the organizing device.

At this point, many of the pieces I had worked on separately came into place and the studio themes began to emerge connected with the three sets of objectives. I was able with more assurance to use Leslie's facets as a focus to refine and continue the reduction process of the data selected. This scheme also satisfied the analysis dynamic going back and forth between the levels of Leslie's beliefs and the level of the studio's activities or her interactions with students.

Nevertheless, I still had to do one more adjustment to the organization of the studio themes. When I merged the data of the students and activities into the triple scheme, there were many reiterations. I made an additional synthesis of the organization
of themes and this seemed to close the analytical circle started with the selection of objectives stating my intentions to portray Leslie's pedagogy and the students' response to this pedagogy.

The data collected allowed me to have a good perception of the studio dynamic. There were accounts from students, the professor, and my field notes about the same events occurring in each observation period. I processed the observation notes and material from the first interviews between on-site observation periods. At the end of the semester, I included in the analysis the observation notes from the last sessions (the review and final presentations) and the material from the second interviews.

Throughout the different phases, the journal annotations and other materials served as important references to help decide codes and relationships among codes, but they also formed part of an initial collage to produce the first writing draft. Having done this analysis, the dynamic became clearer, going back and forth between the two analysis levels, the transcriptions and my interpretation of their links with broader sociological categories. This systematic process refined the writing collage until time limits produced pressure to choose an ending point, one that always is a tentative and partial image of the results I want to communicate. The words of participants have a major role in the narrative of the final writing of the study and my observations and interpretations are intertwined with participants' direct quotes.

Trustworthiness

This study had several sources of external validity (Merriam, 1988): supervision, member checks, and a peer debriefer. Being part of my dissertation, this research was supervised by my doctoral adviser with whom I developed a fluid, consistent and productive work routine. She reviewed the whole analysis and writing process through the end of the dissertation. During the process of analyzing the interviews, I gave to Leslie drafts of the data analysis, both of her depiction and of the students. In the final stage, I submitted to Leslie a copy of the material analyzed for editing. She did a thorough review of this material to check transcriptions of quotes, descriptions of the
students and of the studio dynamic. In addition, I had a colleague researcher as a peer debriefer who discussed with me important issues during the research process.

I addressed the issue of internal validity (Merriam, 1988) by having multiple sources of information for data triangulation. In this case, the sources were the professor, the students, and myself. I interviewed the instructor guiding the studio and analyzed her handouts or written materials. Secondly, I interviewed the students who participated in the studio experience and I observed studio sessions and related activities of the studio.

This case study, as an interpretation of an experience, I hope will encourage other researchers to do more qualitative case studies in other settings. Although the results of this investigation, I believe, cannot be generalized to other design studios in terms of establishing teaching guidelines, it certainly demonstrates a way of portraying and understanding the intertwined experience between students and teacher in design studios. In addition, I hope this case study will serve as a methodological reference to continue exploring this almost ignored important education modality.

Description of Setting and Participants

Setting

Founded in 1881, the New Jersey Institute of Technology is New Jersey's public technological university. It is situated on a 45-acre residential campus in Newark in the New York/New Jersey metropolitan area. The total enrollment is almost 8,000 students, with an undergraduate population of about 5,000. The university offers full-time and part-time undergraduate and graduate studies. NJIT is accredited by the Middle States Association of Colleges and Schools (MSACS). The B.Arch. is accredited by the National Architectural Accrediting Board (NAAB). (See Appendix B Campus Maps)

The School of Architecture, founded in 1973, is one of five academic units at NJIT. The School offers a five-year Bachelor of Architecture degree. This degree is the
first step toward licensure as a professional architect. The School brochure describes the program in the following way:

The program focuses on the development of professional skills in design, architectural technology, business practice and architectural precedent and the development of an ability to think across boundaries—creating general competencies in problem solving, organization of complex processes and systems, judgement, creativity and risk taking. (See Appendix C Brochure School of Architecture)

NJIT is the fifth largest architecture school in the United States and is a national leader in the application of computer aided design. It is the only public institution of higher education in New Jersey to offer the professional Bachelor of Architecture and Master of Architecture degrees. A new building to house the School of Architecture is being built, to be completed in 1998.

The curriculum consists of a core of required coursework as well as upper division options that allow for specialization and choice. The program brochure describes the curriculum in the following way:

The curriculum emphasizes four main areas: 1) Architectural technology such as structural design and construction; 2) The architectural profession with attention to client needs, the practice of architecture and ethics; 3) The ideas of architecture in history and criticism; and 4) Direct experience in the design studio where students are assigned architectural problems to solve that might range from a small room to an entire city block or subdivision. (See Appendix C Brochure School of Architecture)

Among the courses, other than studios, are electives. As with Option Studios, professors can submit to the school administrators proposals of courses they are interested in teaching. Courses are given approval if they correspond to the objectives of the school curricula. In addition to her work in the studio, Leslie has been teaching different elective courses in which she applies collaborative education options. Among these courses are American Home and Household I and II (ARCH 403/404) for undergraduate and graduate students, Problems in Modern Housing (ARCH 557), and Architecture and Social Change (ARCH 572), a community service course for graduates. (See Appendix B: Undergraduate Curriculum NJIT.)
Participants

The Professor. Leslie Kanes Weisman is associate professor and past associate dean of architecture at the New Jersey Institute of Technology. She has taught at NJIT since 1975 as a founding faculty member and holds a B.F.A. in Interior Architecture from Wayne State University (1967) and a M.A. in Urban Studies from the University of Detroit (1973). She is one of four full-time tenure/tenure-track women faculty members in a faculty of twenty and one of two women who teach design studios (There are several women on the large adjunct faculty). She has been George A. Miller part-time Visiting Professor at the University of Illinois, Champaign-Urbana, and has taught at M.I.T., Brooklyn College, and the University of Detroit. She sustains an active, national lecture itinerary and formerly chaired the university's Committee on Excellence in Teaching, having received this award herself in 1990. (See Appendix B: Faculty Profile.)

Weisman's interest in architecture stemmed from her earlier interest in psychology and medicine. Through her volunteer work in an art therapy program in a mental institution that treated autistic children and schizophrenics, she became fascinated by the ways patients were strongly influenced by their external environment. This curiosity led her to study architecture, through the interior architecture program in the Art Department at Wayne State University where she was already enrolled. Neither the Art Department nor the Psychology Department welcomed her inquiries, since the field of environmental psychology had not yet been founded. The program was part of a dual option with art and had little resources; ironically, the lack of support served to motivate her to direct her own learning as much as she could. Therefore she feels that most of her education was self-directed and multi-disciplinary. Not having a formal professional architecture degree has both freed her as an educator from the constraints and identity of traditional architectural training and caused her some anxiety over her teaching in an area that at times seems to her to be outside of the scope of her expertise or own education. Moreover, the fact that as a student she rarely encountered a teacher who was a role model or mentor has motivated her to become that sort of teacher for her own students.
She is among the cofounders of the Women's School of Planning and Architecture (WSPA) (1974-1981) and Sheltering Ourselves: A Women's Learning Exchange (SOWLE). WSPA was a national summer program open to all women interested in the environmental design professions and trades. SOWLE, based at the Women's Research and Development Center, Cincinnati, Ohio, has been operating since 1987 as an international association of women who are personally and professionally involved in issues of housing and economic development for women and their families.

Among her publications are the award-winning books Discrimination by Design: A Feminist Critique of the Man-Made Environment (University of Illinois Press, 1992) and The Sex of Architecture, which she co-edited with Diana Agrest and Patricia Conway (New York: Harry N. Abrams, 1996), and which contains her own essay, "Diversity by Design: Feminist Reflections on the Future of Architectural Education and Practice". She is the 1994 recipient of the ACSA National Creative Achievement Award for contributions to the advancement of architectural education.

Leslie volunteers her architectural services for a variety of projects, including Iris House in Harlem, a center for women living with HIV/AIDS, and directing a design/research team that developed an interactive therapeutic garden for a new children's hospital in Newark. She is known nationally for her innovative teaching style that incorporates feminist values of personal empowerment and respect for human diversity and service-learning as a means of educating future architects who will approach their work not just from a technically sound viewpoint, but also from a concern for social justice and environmental responsibility. (See Appendix E: Curriculum and references of her work)

In addition to her work in the studio, Professor Weisman teaches a variety of elective courses in which she uses lecture, seminar and collaborative teaching methods. Among these courses are American Home and Household I and II (ARCH 403/404), a social history of American housing, Problems in Modern Housing (ARCH 557), and Architecture and Social Change (ARCH 572), which looks at the architectural and planning implications of health care, the environment and housing in the 21st century and
requires a community service project for undergraduates and graduates in lieu of exams. All of these courses are available at the undergraduate and graduate levels. (See Appendix B: Undergraduate Curriculum NJIT)

The Students. Enrolled in the section of ARCH 163 correspondent to this case study are all first semester students at NJIT. Table 3.1 provides a summary of the participants in this study. A thirteenth student in the studio, a white male, chose not to participate in the study. The group included four females and eight males. Seven of the students lived on campus and five commuted to NJIT. Nine of the students were born in the United States, in either New Jersey or New York. Four of the students were themselves or had parents who were born in countries outside of the United States.
### Table 3.1. Students’ demographics.

<table>
<thead>
<tr>
<th>NAME</th>
<th>AGE</th>
<th>SEX</th>
<th>BIRTHPLACE/ DESCENT</th>
<th>RESIDENCE</th>
<th>PREVIOUS EXPERIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alana</td>
<td>17</td>
<td>Female</td>
<td>Staten Island, NY (Hispanic)</td>
<td>On campus</td>
<td>technical drawing in high school</td>
</tr>
<tr>
<td>Alexis</td>
<td>17</td>
<td>Female</td>
<td>New York</td>
<td>On campus</td>
<td>architectural drafting in high school</td>
</tr>
<tr>
<td>Dhamandeep</td>
<td>23</td>
<td>Female</td>
<td>Punjab, India (Sikh)</td>
<td>Commuter</td>
<td>drawing/ graphic design in Rowen Community College</td>
</tr>
<tr>
<td>Eddie</td>
<td>20</td>
<td>Male</td>
<td>Georgetown, Guyana (Asian)</td>
<td>Commuter</td>
<td>CAD courses/ 1st year CCNY architecture (incomplete)/ helped father design and built house addition</td>
</tr>
<tr>
<td>Eric</td>
<td>18</td>
<td>Male</td>
<td>Rahway, NJ</td>
<td>On campus</td>
<td>architecture classes in high school</td>
</tr>
<tr>
<td>Franky</td>
<td>19</td>
<td>Male</td>
<td>New Jersey (Greek parents)</td>
<td>Commuter</td>
<td>3 semesters in Union County College</td>
</tr>
<tr>
<td>Jae</td>
<td>19</td>
<td>Female</td>
<td>South Korea (Asian-American)</td>
<td>On campus</td>
<td>architecture/ interior design/ technical drawing classes in high school</td>
</tr>
<tr>
<td>Josh</td>
<td>18</td>
<td>Male</td>
<td>Elizabeth, NJ</td>
<td>Commuter</td>
<td>interest in drawing/ computer 3D artwork</td>
</tr>
<tr>
<td>Justin</td>
<td>18</td>
<td>Male</td>
<td>Pt. Pleasant, NJ</td>
<td>On campus</td>
<td>drafting in high school/ father surveyor, works with architects</td>
</tr>
<tr>
<td>Matt</td>
<td>17</td>
<td>Male</td>
<td>Elizabeth, NJ</td>
<td>Commuter</td>
<td>mechanical drawing in high school</td>
</tr>
<tr>
<td>Sean</td>
<td>18</td>
<td>Male</td>
<td>New Jersey</td>
<td>On campus</td>
<td>architecture courses in high school/ helped father in house remodeling</td>
</tr>
<tr>
<td>Steven</td>
<td>18</td>
<td>Male</td>
<td>Morristown, NJ</td>
<td>On campus</td>
<td>architecture classes in high school</td>
</tr>
</tbody>
</table>
CHAPTER IV
A FIRST SEMESTER ARCHITECTURE DESIGN STUDIO

The Studio

The [architecture design] studio is the place where the entire education and knowledge base is integrated. The educational format of the studio is a hands-on, direct and intensive interaction between student and teacher. In the studio, the student learns to control the process of creation and to methodically make inquiries and solve problems. Students acquire the means to integrate the many factors under consideration into a successful project and the ability to present ideas to reviewers from the school and the profession (NJIT School of Architecture brochure, Appendix C).

Architecture design courses are named for the space in which they are held. These highly interactive and time-intensive format courses are the backbone of architecture studies at all levels. The ten required studios throughout the five years to earn a Bachelor of Architecture degree represent nearly half of the required architecture credits to be fulfilled by students. Each architecture studio is prerequisite to the next. This means that failing any one studio will hold back a student one semester. At NJIT, all the studios in each of the first three years of the curriculum use, more or less, the same problem statements to introduce the content appropriate for that given semester. The number and type of exercises developed in design studios vary according to the level and thematic focus of the program and faculty. First year student studios are called Introduction to Design I and II and the course descriptions given in the Undergraduate Curriculum are:

ARCH 163 Introduction to Design I (1-9-4) Required
Students are introduced to an array of basic principles and elements of design. Emphasis is on design methods, sensitivity to context, manipulation of form and space, and representation skills. General design fundamentals are presented in the lecture hour.

ARCH 164 Introduction to Design II (1-9-4) Required
Prerequisite: Arch 163. Students continue to develop the basic design principles and skills introduced in Arch 163. (See Undergraduate Curriculum in Appendix B)

All first semester students are divided into small groups of approximately 17 students per professor. In the 1997 fall semester there were five groups. These studios, similar to the ones on other levels, are coordinated by one of the studio professors.
teaching that particular level. Students are encouraged to work in the studio for the length of time needed to finish the project. This means that, in addition to the class hours in which the professor is present, students return to work long hours, sometimes until the next day without getting any sleep. Architecture studios in NJIT, are referred to as "the light on the hill", alluding to the fact that the lights in the architecture building are on all night and they are seen from afar because the campus is located on a high point in the City of Newark.

The welcoming introductory handout given to students by the coordinator in their first meeting clearly states the hard work the students should expect in order to develop "design instincts" and "creative thinking" and how they should prioritize their studies. In addition, the message of architecture culture is included, stating that the goal is "to become not just Architects, but exceptional Architects".

As students of architecture, the Design Studio is the single most important class that you will have. It is here, 3 hours a day, 3 times a weeks [sic], that you will develop your design instincts and creative thinking. You will synthesize a variety of information, not just from your other course work, but also from other life experiences [sic] as well. And it is within the format of the design studio that this will occur...You will be working in studio, not only during scheduled studio hours, but also during off studio hours...[T]his Studio experience will be a rewarding one for those who will accept the challenges and seek the creative potential within. It will prepare you to become not just Architects, but exceptional Architects (ARCH 163 Intro to Design Handouts Appendix D).

NJIT general guidelines follow a curricular structure that is similar to other five-year undergraduate programs in US architecture schools, who are members of the ACSA, the Association of Collegiate Schools of Architecture (the organization of all accredited programs offering professional architectural degrees). This type of program is the norm to earn the Bachelor of Architecture degree. In the same way, this design studio course corresponds to what could be considered the traditional dynamic. "The architectural design studio operates fairly consistently throughout the United States" (Lewis, 1985, p.45). While these schools share many commonalities, they also include variations among them. Within each school, there are differences among the design studios.
For example, the "studio critic", or professor in charge of the studio, can operate more or less independently or "may be a part of a coordinated effort involving several sections, an entire level, or even an entire school" (Lewis, 1985, p.45). This introductory design studio course forms part of a group of five first semester groups that follow a common organization. The professors in charge of the studios observe general guidelines agreed upon previously but the coordinator is in charge of the syllabus and exercises which all will follow.

The design exercises are the same for all the groups. The instructions for each exercise are given to all the studio sections in handouts in a quite general way, giving the opportunity for professors of each section to establish additional conditions for the project. These changes include suggestions for approaching the exercise or the choice of materials, among others. In the Fall 1997 academic semester, students had one preliminary exercise to do in one week, four exercises to develop in two weeks each and one final project due in three weeks. In addition to these exercises, they had to organize a portfolio with studio materials and with assignments from their drawing class (see handouts in Appendix D).

Studio activities are the same for all first year studio groups, including the freshman review, desk critiques and internal pin-ups. These activities are centered on the accomplishment of a design exercise which generally involves creating a model and drawings. These requirements could be modified depending on the exercise and the professor though they always maintain their basic purpose of expressing graphically the solution for the assigned design exercise.

Desk critiques (crits) are individual sessions in which the professor comments on a student's work, analyzing it or pointing out corrections to the exercise being developed. As its name indicates, it is held at the student's desk. This is done for practicality because if students are working on a model or drawing, the sketch is usually attached to the table where they have all their materials on hand.
The pin-up takes its name from the hanging of drawings on the wall to be seen by the whole class in order to have group critique sessions. Usually the student talks about the work and if they have models they are included in the presentation.

All the first semester studio groups met periodically throughout the semester in sessions called freshman reviews. This meeting was held in a campus auditorium every fifteen days. The general guidelines for the seven exercises they had in this fifteen-week period were given to students in these reviews. Besides the task assignment these meetings fulfilled different objectives.

The first and the last meetings had special functions. The first was an introductory meeting to welcome students at the beginning of the semester. In it, students were given a first semester master schedule including, besides design studio exercises' assignment dates and deadlines, the due dates for other first year courses. The last session was the all first year section review ending the studio activities. For this session, guest jurors were invited and, along with the freshman professors, they reviewed the projects of the students who had been chosen by their professors. At this time, two students selected from each studio section presented their own projects.

The other six freshman review meetings included two different parts. The stated objectives were to present two projects of each studio group by the respective professor and to introduce the new exercise. The exercises of the semester were set up by the coordinator and distributed, in handouts one at a time, in each of these sessions. In the first part of the session, each professor first commented on her/his approach for the exercise to guide the students. Then she/he described briefly two or three of the students' projects previously chosen by her/him. After all professors finished the review part of the session, one of the first semester professors took turns to introduce the following exercise. The presenter gave a lecture with slides about design/architecture issues related to the general guidelines of the assignment.

There were other outcomes from these meetings. In practical terms, the freshman review served as a controlling tool for students to keep deadlines. The freshman
reviews provided for both students and professors a connection point to others in the program. In the rather formal atmosphere of the auditorium location, students and professors from other groups compared how the exercises were guided by the different professors. On one hand, professors’ statements and the sample of results gave students the opportunity to see how each problem could be acceptably solved with different methods and approaches. On the other hand, professors were able to observe how each of their colleagues approached the exercise. Normally, there was almost no communication among professors about the studio work. Sometimes they would pass by some of the studios and see what other groups were doing, but the usual way in which professors and students knew about each other’s work was through this meeting.

Leslie added other studio activities and introduced a different learning climate into these standard design studio activities. She established a weekly group meeting in a round table format as an internal group review. In this meeting, students were seated around two of the adjoining drawing tables. This format created a more friendly atmosphere for students to share opinions about their projects and for Leslie to share news or plans about future activities. Its objectives were similar to that of the pin-ups, but in this first semester studio, Leslie herself presented each of the students’ projects asking them to comment about their peers’ projects before the general freshman review. In higher levels, students present their own projects. Leslie added the requirement of a design journal for students to keep track of their design explorations. In desk critiques, she always asked to see it and insisted on using it as a useful reference when students needed or wanted to change gears on a project.

Besides the weekly group meeting and the journal, Leslie also added activities that differed from the other studio groups. The October inauguration of the Guggenheim Museum by Frank Gehry in Bilbao was used by Leslie as a motive to discuss architects and their methods. She gave them a recently published article about the museum to be read before a video session. She organized an informal session, with popcorn and drinks, to watch two videos about the works of Frank Gehry in which he talked about how he worked on his projects and his ideas about architecture. This activity offered the
opportunity to the group to link general principles about composition, form, and aesthetics which had been discussed in studio reviews of their projects connecting specific design issues to the larger picture of architecture in the "real world". The other extra activity done in Leslie's studio was to do a final group review with invited guests as jurors. This was done at the end of the semester, as a practice session for the final freshman review to be held the following week.

Besides the general handouts of the general schedule given at the start of the semester and of the exercises given every fifteen days, Leslie gave to her students a detailed schedule for the last weeks of the semester. In it, she specified the work that was to be accomplished and the internal activities of the group, so students would have a written reminder amid the hectic times of the end of the semester. (See in Appendix D 163 Intro to Design I syllabus, master schedule and handouts on semester exercises, and in Appendix E detailed schedule for final studio project in Leslie's studio).

The studio space assigned for this semester to this group was not in good physical condition and was being used as a temporary space while the new architecture building was being constructed. It had been previously used as a computer design lab. This former use required multiple electrical connections which were added externally, running from one side of the studio floor to the other. These connections, covered with protruding rectangular metal tubes, added to the cables from the students' table lamps and were a constant obstruction when walking through the space that was crowded with drafting tables and stools materials. Nothing could be done about it because the School was waiting to move to a new building and this area would be remodeled later.

While waiting for the new building, two studio groups had to share a large space. The part Leslie's group occupied was approximately 18' x 22'. It contained 2.5' x 3' drafting tables on which each student could work. To improve their dilapidated desktop surface conditions, students brought their own wood tops or they added soft plastic covers and parallel rulers to do their work (See Figure 4.1 with the location of each students' table).
The location of the tables helped to consolidate likings or was motive for unfriendly happenings within students. Students who lived in campus spent together more time in studio, strengthening friendship bonds. Alana and Alexis had tables facing each other and got along well, chatting among them or having visitors from other groups. Eddie and Dhamandeep, the more mature students had the opportunity of being near, but they seemed to be very busy in their own work. Alana closer to Eddie, had him as
consultant using her proximity to Eddie's table for a friendly interchanges. On the opposite diagonal of the room, Steve isolated himself with a walkman. Though in spare time, he went to the extreme to Eric and Sean's tables. Justin loved to spend time with these group he knew from high school and lived in campus as him. Jae seem to be always mingling around and Matt and Franky, both commuters, seem to be out of this tighter group within the studio. Franky, a more serious student, was somewhat out of place where he was, surrounded by peers who like to make jokes he did not enjoy.

The Professor

Who is Professor Weisman?

The students greatly appreciated Leslie's personal qualities. All of her students acknowledged her ability as a teacher and the attention and encouragement she gave them in exploring their design ideas. Her extroverted, warm personality helped to create a friendly learning environment in the design studio. Learning is fun for her. She transmitted a dual message to students: design studio is about their learning process and is to be taken seriously; but, this task, though assumed with commitment, should also be fun. Leslie believes that, since there is never only one "correct" answer for a design problem, but rather more or less appropriate solutions, all explorations are valid and the task at hand is to bring to consciousness an awareness of each students' approach to the problem solving process.

(Alana) I think she's very smart. I'm just overwhelmed by how much she knows. It's amazing. She's very good. She always gives me ideas. She's very friendly in helping you decide how to better your project. I like her a lot. I feel very lucky to have her.

(Franky) [From] the first day of studio I had a good feeling because she is a great teacher. The way she talks, the way she [teaches] this class...she gives us hope.

(Matt) She doesn't just tell you to do something and then you do it. And if it's not right she won't get mad at you...she doesn't get frustrated.

Students also admired her multidisciplinary background which allowed her to diversify her comments and provide interesting and pertinent critiques or suggestions for
their projects. Leslie's transmission of this knowledge, both from architecture and other disciplines, encourages students to look at architecture beyond the limits of their studio projects. She motivates them to be critical thinkers, examining their projects from different perspectives.

(Alexis) She's, like, so smart in so many different ways. She knows so many different things. She's got so many different degrees. She'll come from, like, any angle and analyze and knows exactly what to say, she can talk about anything.

(Matt) I think she's great because she explains a lot...she's really smart. She tries to get herself to think about other aspects to try to help us. She doesn't just think about one thing, one way of teaching or one way of trying to do something. She's very open minded about things, which is very beneficial.

Students said that she gave them more than what they saw other professors give to other studio groups.

(Sean) I like Professor Weisman. She seems interested in everything. I see the other professors, they just leave the class and just have the students work. But she stays and helps you with it. So I think that's good. It's probably just her personality 'cause she just stays there the whole time and spits out ideas that she has and tell us what you could do with it.

(Josh) I think she's great...She goes about things, like, differently than the rest of the studios go about them...It's a different approach...we got, like, a bigger variety of stuff to look at and to examine.

(Franky) I feel like she's the best professor in the school.

Leslie's passion to be a good teacher was appreciated by students. They felt that she gave generously of her time, energy, and knowledge. In addition, they acknowledged her efforts to communicate effectively with them.

(Dhamandeep) She's incredible. I really like her...some professors go easy on you but this one, she really wants that the knowledge she has, to pass that knowledge to you. That's what I like about her.

(Jae) Whenever she critiques my work, she gives it to me a hundred percent. Like she's totally into it...She just makes me do work sometimes. She's so inspirational.

(Steve) I love her. She's the greatest. She's so fun to be around. I appreciate [how] she tells you everything she sees and what she'd like to see. I love the way she teaches and everything.

While she used many jokes to lighten her interactions with students, she did it carefully. Funny remarks were used as a means of encouraging explorations, directed
toward making less important that which students could perceive to be errors. With this attitude, both demanding and relaxed on her part, she encouraged students to see wrong turns in the design process as necessary for achieving better designs. Laughing about what did not come out as expected allowed students to relieve tension and gather energy to continue the hard work until the assignment deadline.

(Alexis) I think she's great...first of all she is...so funny. She's so talented...and she's so helpful.

(Eric) She's nice. I like her input on my ideas and how to develop them more. She's interesting. She has quite a background and all that. She's pretty funny, too. She tries to crack jokes.

Despite Leslie's friendliness and funny side, she drew a boundary of respect between her and her students. One of the means for creating this subtle line was about how she had students address her. Leslie was clear about this boundary and she gave different reasons for her use of it. The following is one of the arguments Leslie gave when asked about why students did not call her Leslie:

(Leslie) They will eventually but right now it's important that they don't. I introduce myself by my name as Professor Weisman. That's the end of that. I think it's very important. It's sort of like your therapist. You need to have a certain boundary. They are used to teachers being authority figures. I can't be their buddy right off the bat.

Some of the students commented on the distance of the professor-student relationship established by Leslie. Both Alana and Alexis commented specifically about it. It did not bother Alana. Alexis expanded on the possible reasons Leslie would have for it. She contrasted her perceptions about Leslie with the ones she had when observing other professors' behavior with students.

(Alana) I know she's the professor and we're the student but on the same level because it's more comfortable and helps you be better with what you're doing...it's one less thing to worry about.

(Alexis) She [Leslie] gets close with us but doesn't get like real close. I noticed other professors walking away with students and talking about like more personal things, like their family life and closer things. She never gets really that personal, which is not bad. It doesn't matter. It's probably that she doesn't want to get favorites or anything.
Eddie and Franky emphasized the importance of her personal merits and academic achievements. Students inevitably compared Leslie with other professors they have had or have in other classes. Dhamandeep, Eddie and Franky, having had previous college experiences, had a wider range of information upon which to base their comparisons. In addition, these students came from diverse backgrounds and had a more mature attitude toward their studies. Seeing Leslie within a wider perspective increased for them the value of her comments and critiques.

(Eddie) In this school, it's a little better constructed curriculum. I think there's more guidance here than there was over there [City College of New York]. Not that the professors were so different. Professor Weisman is pretty good handling students as far as I know. [By] handling--I mean [that] I like her input. She has keen insight...I respect her opinions because I know she has a lot of [teaching] experience.

Eddie liked the fact that Leslie has a good reputation around the country. The importance he assigned to Leslie's personal and academic achievements was easily understood given his background and family conditioning, one which was very demanding and placed high value on those merits.

(Eddie) The fact that she's recognized for something makes me feel that [I should] take as many of her advices as [I] can. I should learn from them. So when she says that my model is simple and that's what I should concentrate on, I take that. She says that [good] work comes from experience, meaning that it's hard to come [up] with something so simple.

Franky reasoned that students were good in the other studios because they were talented and not because of the professor. He thought that he observed well and looked for the best. He made inquiries about other professors and compared them with Leslie. He concluded proudly:

(Franky) From the beginning, I went to all the classes and I saw, and I asked people how the professors are. I'm not telling you she's the best because I'm just telling you. I saw the other professors. I always [compare]. I don't want to be in the darkness. I'm not in the[ir] class every day so I can't see what they're doing. But from the results and from some people telling me, I know. I have some friends that are so talented, [but] they do well because they are so talented, not due to the professors.

Students reflected candidly about how they appreciated Leslie's multi-faceted personality and the benefits they obtained from her studio teaching. My experience of Leslie, gained through observations and interviews, was the same as her students. I
was captivated by her extroverted personality and admired her multidisciplinary
background and diverse interests. Her main feature was her love for teaching and her
deep concern about the development of the human potential in her students. For her,
introducing them into the "how to's" of design became the medium to foster within them
personal creativity, critical thinking and ethical development.

Leslie's studio pedagogy and her role in the studio dynamic of this group seemed
to be motivated by three distinct sets of beliefs. These beliefs were conveyed through
the expressed studio guidelines and subtle attitudes on her part. I have grouped them
according to what I sensed were Leslie's three most significant personal facets: the
feminist, the architecture scholar, and the teacher.

Leslie the Feminist

Leslie considers herself to be a cultural feminist. By this, she means that her
interests encompass more than gender equity. She is also an advocate for
environmental causes and for social justice for groups that are disadvantaged by virtue
of their race, income, age, disability status, or sexual orientation. These are the main
concerns that have guided her life and scholarship.

In the following diagram, Figure 4.2 Objectives of Leslie the Feminist, I point out
the educational principles that Leslie has derived from feminist pedagogy. These include

(a) the use of collaborative learning, in which "interdependent, team problem
solving and 'co-creativity' are practiced and rewarded over competitive, solitary problem
solving and individual creativity" (Weisman, 1996a, p. 41);

(b) the sharing of authority and knowledge by the teacher, questioning "their
monopoly over knowledge so that students are empowered to direct their own learning,
and so that people in other disciplines and with different life experiences can join in the
learning process" (Weisman, 1996a, p. 41);
Figure 4.2. Objectives of Leslie the Feminist.

(c) the elimination of "false dichotomies by creating learning situations that connect academic theory with applied practice and by establishing collaborative relationships among designers, clients and user groups" (Weisman, 1996b, p. 281); and,

(d) the emphasis on ethical values with a "respect for human diversity and [recognition of the] interconnectedness among all of humanity, the natural world and the products of human design" (Weisman, 1996a, p. 41).

The context of Leslie's work within a traditional architecture school and university system which is oriented toward mainstream professional architecture goals based on a hierarchy of power and promotion of individual achievement and an elitist identity made it somewhat difficult for her to pursue these principles which promote other values and capacities. She has managed, however, to use educational methodology that is based on these principles in the higher level design studios and non-studio elective courses she also teaches while still working within the frame of NJIT academic regulations. In the case of this first semester studio, the teaching strategies Leslie incorporated helped to develop students' personal empowerment and group networking abilities.
Along with complying with the NJIT academic organization and program requirements, Leslie was concerned about the socialization process these first semester students must undergo while adapting themselves to the college culture.

(Leslie) Ethically, as a part of a core curriculum I'm obliged to really not confuse my students. This is their first semester at a university, let alone in a major like architecture that is so different from any[other]. I think they have to be oriented to the campus, to the city of Newark, to a social life.

Leslie expressed how she understood her role as a teacher who believes in introducing teaching strategies that emphasize broader collaborative skills, while at the same time she was aware of both her responsibilities as the guide of a first semester studio with a fixed syllabus to use the same projects as the other studio sections and to ensure that her group maintained their sense of belonging to the larger first semester group in school.

(Leslie) So getting them acclimated to simply being aware of the diversity and the diverse strategies for problem solving is one thing. [I cannot say] "I'll cover this content but I'll do it in my own way". I would be robbing my group of students from their belongingness to the larger freshmen class, which I think is far too premature. [I think] you need to know what the norm is before you deviate from it. Otherwise it's very hard to assess your own progress throughout the sequence of the five years.

These, among other reasons, have somewhat limited Leslie in introducing in this group more teaching strategies inspired by feminist pedagogical strategies. She has applied these strategies in other scholarly work and in her upper division studios in which she, like her other colleagues, is free to choose both the subject (content) and form (methodology) of her teaching.

The strategies evident in the dynamics of the studio that helped portray this facet of Leslie were (a) students' empowerment as the core value inspiring Leslie's studio pedagogy and her relations with students, and (b) group networking used as an initial step toward future collaborative work. These two strategies have been expanded in the next section of the studio themes as building confidence and group networking.
Leslie the Architecture Scholar

Coexisting with Leslie's feminist educational principles is her interest in architectural knowledge and aesthetic appreciation. This combination of educational and architectural interests drew her towards architecture education. Her situation as an architecture scholar oriented by cultural feminist principles is expressed in her essay published in *The Sex of Architecture*.

I write as an architectural educator who believes that it is professionally myopic and morally irresponsible to teach students to evaluate architectural work in terms of aesthetics, building performance, and cost without also teaching them to consider whether what they are designing is ecologically intelligent and socially just (Weisman, 1996b p.274).

In this studio, students were just starting to be introduced to design principles. The basic design exercises required by this course level did not give Leslie much opportunity to stress these ethical issues which are linked to architectural work. Nevertheless, she always found ways to make comments which related the abstract exercises students were working on to the larger issues of architecture.

Leslie's cultural feminist values did not in any way diminish her interest in exploring the core of mainstream architecture: the aesthetic of form. Her enjoyment of beautiful form was stimulating to students. Besides her attentiveness to the designs they were creating, her comments were directed to the development of their sensitivity toward beautiful architecture and enjoyment of and respect for nature.

She took many opportunities to introduce students to celebrated architecture works from different cultures and times, without losing focus on the concrete task of their assignments.

(Leslie) I tell them, Day One, I am as concerned as anyone else here with beautiful form and the quality of their drawings and models, the artifact per se, both in terms of its conceptual clarity and also its fabrication. However, I am as or more concerned with their abilities to think, to learn, and to become more self aware of their own unique creative abilities.

Leslie was well aware that her multidisciplinary background, art training, and cultural feminist beliefs could pull her studio objectives in a direction opposite from
program requirements. Nonetheless, she was conscientious in dedicating extra time and efforts in guiding her architecture students with high standards without sacrificing either of them. The following diagram, Figure 4.3 Objectives of Leslie the Architecture Scholar, outlines the objectives Leslie the architect scholar had for this first semester studio group.

Figure 4.3. Objectives guiding Leslie the Architecture Scholar.

The development of design skills included two different areas: (a) the acquisition of expression skills; and, (b) training in creative problem solving skills. Expression skills refer (a) to the drawing and model making which allowed students to give form to their ideas, and (b) to the communication skills needed by students to reflect upon their own ideas and to explain their processes and projects coherently to others. The studio
objective of developing drawing and model-making skills was shared by the graphics course, one of the students' required courses during their first semester.

The training in creative problem solving skills included three interconnected areas with different pedagogical strategies. These are (a) training in the generation of ideas, (b) developing conceptual clarity in their proposals for projects, and (c) acquiring critical thinking skills in relation to both the conceptual evaluation of ideas and the appreciation of aesthetic nuances that untrained people don't notice.

The socialization of students into the architecture culture, like other socialization processes, is a subtle individual passage. Entering college and an architecture program means students are expected to be part of the professional architectural culture, learning the language and sharing its values. This culture is not written down nor is its acquisition directly tested, but the students must become proficient in it if they want to participate fully and succeed in their studies.

This socialization process encompasses the set of objectives linked with Leslie's cultural feminist principles and expands on the traditional values of the mainstream architecture culture. Architects' ethical codes are generally assumed by architecture education to be derived from architecture practice. These codes are limited to the architect's liability for the sound construction of their projects. According to Leslie's principles, architects have responsibility, as well, towards the environment and social justice. This opposition reflects the two discourses in architecture-- the practice of architecture as a formal art versus a social art (see Chapter II). Leslie dwells in this controversial realm, in opposition to mainstream architecture. She has committed herself to integrating these values into what students need to become part of the architecture culture.

The first step in assimilation is learning the language. This aspect was very challenging for some students and even more so if students had to participate in this new culture without having "formal language lessons". According to most of the students
in their first stage of the socialization process, Leslie's excellent communication skills facilitated this complex transition.

**Leslie the Teacher**

Leslie is well aware that who she is emerges in her studio pedagogy. Her personality contributes strongly to her way of relating and communicating with people in general. Her strong beliefs were translated into studio objectives and expressed through her studio interactions with students.

According to her criteria, a designer "has to develop both a self-assurance and a resiliency towards criticism". Her interest in both education and psychology has sensitized her to the emotional and intellectual needs of her students. One of the main themes of the studio dynamic was the focus on the personal development of each student, a focus that was imperative for her goal of educating socially responsible architects. "Their job as a student is not to know everything. Their job as a student is to develop their fullest potential."

Leslie is attentive to students' needs and is caring and supportive of each one of them. At the same time, she demands "high standards" and "good study habits" as the educational basics this first semester group of students must acquire.

(***Leslie***) The first task I put before myself, especially with freshman first semester, is getting to know each one of them as individuals...and as a teacher, what I'm concerned for, equally, is their good beginnings. That they establish good work habits and high standards, but they don't become overwhelmed...

The following diagram synthesizes the description of Leslie the teacher's objectives, corresponding to the two aspects of this facet: the "demanding teacher" and the "humanist professor" (see Figure 4.4 Objectives of Leslie the Teacher). The demanding teacher depicts features of what is expected from a "good teacher" according to students' comments.
I have chosen the term "humanist" to indicate the connection between Leslie's principles as a cultural feminist and the field of humanist psychology that inspired educational changes in the 60's towards student-centered education (Rogers, 1969).

Besides these objectives related to the students' studio performance and to the human development beliefs connected to feminist educational principles, Leslie stresses the importance of the students' process of socialization into college life. She believes that first semester students need to expend a great deal of their energy in coping with adjustments. In addition to the usual college adaptation, architecture poses extra challenges because of the students' initiation into the complex architecture culture and the new skills required by the studio learning experience. This is why Leslie invested care and energy in attending to the different needs of her students.

In summary, Leslie had the following objectives for this studio course: students' empowerment, group networking, development of design skills, socialization into architecture culture, development of high standards and good work habits, and fostering each student's development as a person through caring support. These studio objectives which emerged from Leslie's three facets-- the feminist, the architecture scholar, and the teacher-- guided the studio dynamic of this group of students. In the
next section, a profile of each of the students will be presented before describing the studio dynamic which evolved among Leslie and her students.

The Students

Alana

Alana is a seventeen-year-old sweet-looking girl, the youngest of the group. She was born in Staten Island, New York. She has big, expressive eyes in a long, thin face framed by a large amount of long dark hair. She seems to not pay much attention to her looks. During the observation period, she wore a green band across her chest and a special ring with a yellow rose as part of the pledging ritual for a sorority. Despite being so young she is very responsible and takes her work seriously. She did the same during her high school years, when she was always on the honor roll.

She described the shift from high school to college as challenging. In high school she was able to do well without working too hard, but she found that she had to work hard at NJIT. Her way of adapting adapted herself to college life was to involve herself in a number of extracurricular activities, including a sorority, cheerleading, and a job. She also has a boyfriend. All of this required a lot of balancing, but she felt that she did pretty well with it. She also pointed out that she was one of the youngest in her class.

Even though her looks give the impression of a childish, nice-looking girl, when she speaks she sounds more mature, determined and with a strong character. Her previous training related to architecture included a mechanical drawing class and an architectural drawing class in high school. Alana was aware of both economic constraints and her lack of knowledge that made harder for her to cope with the assignments of the different courses.

Alana was the only student of the ones living on campus who said she missed her mother, especially recently when she had been sick. I believe that her Spanish family upbringing, giving importance to closeness in family relations and with friends, made a difference in the way she managed her adaptation to campus life. My experience
has been that in latino cultures family bonds are very much valued. Even when children grow up, they continue to be close with their parents, who can be sometimes very overprotective and controlling. The way she expressed herself about her mother reflected the caring relation she had with her besides being away from home for the first time. Her relation with Leslie was good even though she complained that Leslie did not explain as much as she needed due to her deficient preparation in order to do her drawings. She was friendly with her peers and express how much she valued their camaraderie and solidarity helping her when she had problems understanding or doing the exercises.

In the beginning of the semester Alana had problems trying to generate ideas and she felt worse comparing herself with other students that she believe were doing better than her. Her table in the studio faced Alexis’s who was one of the most productive students of the group. Even though Alana had good relations with Alexis, I believe that this physical closeness watching her friend working steadily increased her insecurity. She shared how she managed to change this negative situation for her, concentrating in her work and purposely not looking to other’s people projects. I found that this to be a significant characteristic of her personality denoting both an unusual awareness of her problem and capacity to overcome it.

Alexis

Alexis is an attractive young woman born in New York. She looks comfortable in her petite well-built body and she moves with great self-assurance for her seventeen years. She has big hazel brown eyes in a rounded face with thin lips that open in a generous smile. She has reddish brown curly hair, long enough to make a neat ponytail occasionally. She took care in her grooming and style of dress, being youthful but not radical. She changed hairstyle frequently and emphasized her looks with well-applied make-up. Alexis is very expressive and talks very fast, laughing easily and joking with her peers.
Alexis spoke of adjusting to college and realizing how she was not prepared for what it would be like. Although she had been forewarned, she had not believed what she had been told. She thought that if she worked hard she would do all right. Her previous training related to architecture included architectural drafting classes in high school but the reality of the first month was very different from what she had expected. Her concern was unfounded when she realized that she did well in her courses. Balancing the demands of her different classes and extracurricular activities was hard for Alexis. She realized that she was not managing well at meeting the demands of her different classes. She said that while she was doing well in studio, she was doing poorly in her other courses. She was working at learning how to organize her time.

Alexis spoke of economic issues she felt, particularly her lack of spending money. Alexis named several changes and disappointments she had experienced, including lack of sleep and less social life. She believes that to study architecture you "have to have a little bit of some kind of artistic ability" and that anybody can do it if you are willing "to work really hard". She has a great motivation to study architecture and compared herself with other students who "don't seem to like what they are doing".

Her motivation and hard work paid off for her. Alexis reaffirmed herself in her capabilities for design. In the beginning, she had doubts about studying architecture. She was one of the "hooked" students that began enjoying the process of creating. She still has to learn to balance the work required by other courses and the effort she wants to put in design. I believe that to succeed in the pursuit of her degree she has the most important condition, she tasted the pleasure of design, the rest will come along. Alexis very much admired Leslie. I believe that especially for her and Alana Leslie not only served as a positive professional role model but gave them the caring support that allowed the flourishing of their creative capacities.

Dhamandeep

Dhamandeep is a dark-skinned, petite, rounded, sweet-looking Sikh young woman. She has very long, slightly curly hair, simply pulled back. She doesn't wear
make-up and seems indifferent to clothing styles or trends. She is the oldest student of the group, being twenty three years-old, but she did not seem like it. She moves and speaks calmly without raising her voice. Though timid in her interactions, probably in part because English is not her first language, she felt comfortable with her peers. She took pride in her work, knowing she was doing good work, and enjoyed every moment of being at NJIT studying architecture.

She lives in Westhampton, New Jersey. Her previous training related to architecture included courses at Rowan in drawing and graphic design. She appreciated how these courses she took were taught and how they had helped her with her assignments now at NJIT. She spoke of her concerns at the beginning of the program, questioning whether her knowledge was good enough. She found reassuring that in this class all ideas were valued.

Dhamandeep was proud of being in this program and doing well. She could have gone to a local community college architecture program but wanted to go to NJIT because she thought it was better. Going to NJIT meant a long commute from her home, two hours each way, four days a week. This long trip was part of why she did not start the program earlier. As well, her time restrictions did not allow her to expend extra hours in studio and interacting more with her peers. Dhamandeep described being focused on school when she was there and centered in family life when she was home.

She generally finished her work but when she was not able to, her feeling of being irresponsible was the worst sentiment she had about her studio experience. In contrast to Alexis, who wanted to work until the last minute, anxious to explore further and as much as she could, Dhamandeep worked with a more relaxed pace, feeling more secure of what she did. She was the only student who expressed that studio work was not as difficult as she expected.

Dhamandeep discussed how she had always liked drawing, seeking out opportunities to draw. Her motivation was her own, saying that "my parents didn't push me into drawing...in my country they would say drawing is a piece of cake. Anyone can
draw. But actually everyone cannot draw, right? It's like a talent. I just like to draw. And that is why I'm in here."

In the case of Dhamandeep, her family message that drawing is something everybody does, the artistic training she had in the community college, and her maturity and personal traits unite to ease her studio experience. Leslie's various messages found in Dhamandeep the most favorable receptor. To this, it must be added that her limited household conditions, not having a drawing table to work on and having to commute four hours, four times a week made her value much more the studio environment "where she has her own table". She felt very fortunate and did not have any motive for complaint.

Eddie

Eddie is a very thin, dark-skinned, nice-looking young man. He dresses conventionally and moves with swift, rather nervous movements, as if trying to perceive with his body all that is going on in his surroundings. He is rather quiet, but can enter into long explanations about studio work, delving into issues far beyond the first semester level. His serious behavior makes him appear much older than his twenty years of age, even though he also enjoyed interacting with his peers and Alexis making jokes to him.

He is married and commutes to the NJIT campus from Palisade Park, NJ.. His previous college experience included one incomplete year of an undergraduate architecture program at City College of New York. He found that this experience was very different from this one at NJIT. He helped to design and build a two-story, 1,000 square foot addition on his father's house in Pennsylvania, as well has had CAD experience.

He was born in Georgetown, Guyana were he spent his first ten years living with his mother, and then moved to the US to live with his father and two of his sisters. Growing up, he did not socialize a great deal outside of school, but stayed home with his sisters. He commented on the differences between his experiences in the US and Guyana, saying that it is more laid back here. He feels that the educational system in the
U.S. does not produce as good results as in other countries because he sees it as not as rigorous.

His early schooling in the British education system and the influence of his father, a very authoritarian figure and also a teacher, had a great influence on his attitude towards serious study. Eddie has found through his discipline and dedication real pleasure in looking for knowledge.

Eddie believes that his interest in architecture came partly from the influence of others and partly from his own enjoyment of math and geometry. Eddie has high expectations for himself after graduation from NJIT, hoping to make a high salary and work for himself. He works hard at school, often missing sleep.

Within the group, his seriousness and responsibility translated into hard work and discipline in doing the studio projects. Despite that he felt that his skill level was above the group, his thoughtful attitude made him gain the respect of his peers. He acted in the group as a virtual teaching assistant to Leslie, collaborating with them in solving problems about their projects.

The value that Leslie had for him as a role model and the support that he acknowledged from her being a woman professor is better understood in the context of Eddie's background and family conditions. Eddie's interaction with Leslie was rewarding for him but also highly demanding from a psychological point of view. He strived to produce his best work driven by his high standards but, at the same time, this effort made him stick stubbornly to the idea developed. This attitude made it difficult for him to handle Leslie's critiques. His results were good, usually among the best in the class, but he struggled to accept that he should make changes to his work or that there were possibilities interesting to explore he hadn't thought of. With this particular emotional conditions, I believe that learning to deal with unstructured exploration and uncertainty was very difficult for him.

In Eddie's case, Leslie's powerful role model was reinforced by his family upbringing which was mainly without his mother's presence. I believe that his early
marriage and his comments about the importance of Leslie being a woman teacher reflect his need for a compensatory maternal affective support. Leslie complied with and reinforced the high standards Eddie set for himself and by which he measured his peers and his professors. His responsibility made him also felt very depressed when, for reasons outside his control, he could not keep up with studio timelines.

I found Eddie's rational, logical way of solving problems contrasted sharply with Dhamandeep's, for whom designing was like playing and who relied more in her intuition and aesthetic sensibility. In addition, Dhamandeep and Eddie could be quite similar in terms of personal level of maturity, responsibility toward their studio work, and having excellent results. However, it was interesting to compare their almost opposite learning processes, their feelings about them and the type of projects they made.

This twenty year-old, accurately portrayed by his peers as "Granpa", used his knowledge and investigative skills to bridge the gap between himself and his classmates in a positive way. At the same time he developed additional skills that will surely serve him in the future and that I believe helped him overcome the feelings of inadequacy that he had when Leslie corrected or suggested new ways to approach his design projects.

Eric

Eric is a tall, timid, white, young man. For me, along with many of the other male students, he fits the stereotype of a white American middle-class adolescent boy. His posture is a bit slumped and he moves somewhat awkwardly, as if he hasn't grown into his whole body. His clothes hang from his bones. He talks as if cutting into pieces the words and phrases he uses. He occupied one of the tables on the edge of the studio on the border with the other group. From this position, he could watched the whole group. At the same time, he faced Sean at the table across from his. He seemed to like this arrangement, seeming to be not too talkative despite enjoying to play around sometimes with his peers.
Eric is eighteen years old and lives on campus at NJIT. He was born in Rahway, New Jersey. He had no previous college experience and his previous architectural experience included a high school architecture course and computer aided drafting. Eric's family influenced his interest in architecture, primarily Eric's father who wanted to be an architect and took some courses at NJIT, but never got a degree. He hopes to make a good living from architecture and focus on residential architecture. He seemed to balance academics and extracurricular activities well. He spoke of spending time with friends and thoughts about getting involved in intramural volleyball. He organized his time well, working on the project that was due first.

Eric liked the atmosphere of the studio, finding it important for him to realize that he could do creative things and that people would praise him. His self-assurance increased as a consequence of his projects "I like it when the other people come over and say 'Your project is cool'". He appreciated and depended highly on what Leslie had to say about his projects. It was not surprising when he said he was one of the students whose best studio day was "when [Leslie] says she likes my project. It makes me feel good. I'm proud of my project then".

Besides Dhamandeep, who felt that studio work was less than what she had expected, Eric was the only one who did not stay up late doing studio work. He organized his time to do the work that was due first, whether studio or non-studio. He thinks students that stayed up late did so because they did not start working when they should have. Most of the students gave absolute priority to design work, as did Alexis. It seemed that Eric was not as driven or motivated as she was. He said some people were procrastinators, and then they were complaining they did not have enough time.

Referring to the studio time, it was interesting the contrast between what Dhamandeep and Eric said about it. Dhamandeep said that in studio "the time flies fast and you don't even know when you came to the class" and Eric found that what he disliked about studio was the length of it because you could have your stuff done and "you're just sitting there and you've got nothing else to do." As Eric, the students less
motivated for the design process complained about the long hours of studio and others, with Dhamandeep in the extreme, thought time flew by.

Franky

Franky is a thin, medium height young man with light brown skin, dark eyes and hair. His looks announce his Mediterranean origins. He is extroverted, talkative and very determined. He has an opinion about everything based on his perceptions and is eager to learn about architecture. His experiences living and studying in Greece made him more appreciative of Leslie’s interests in opening students to a contextual perspective of architecture. He and Eddie, in addition to their multicultural backgrounds and previous college experiences, share the same motivation and responsibility with which they assumed their studio work. More so than with other students, his achievements were related to life changes.

Franky is nineteen year old and is one of the students who commutes to the NJIT from Roselle Park, New Jersey. He was born in New Jersey of Greek parents and moved to Greece when he was six years old. He attended Union County College for three semesters and took History of Architecture and Drawing 1. Franky’s decision to study architecture was partly influenced by the landscape in Crete. He attended elementary school and high school in Greece.

He came to the US two years ago to study architecture, but first needed to study English. After taking courses at a community college, he chose to attend NJIT because of recommendations from a cousin who is in NJIT and also was a former student of Leslie. He told Franky about all the hard work, but also inspired him sharing his projects with Franky. His first impressions of NJIT were that it was disorganized. He commented on being given a list of materials to buy that was not appropriate and on faculty being late for classes.

Franky was very focused on his plans to be an architect in Greece. He wanted to get some experience in the U.S. and then go to Greece to work with another cousin.
who owns a large architecture firm. He recognized there will be challenges, acknowledging that it would be hard to start work in the US and then have to start over again in Greece. Despite these potential difficulties, he was determined to follow this plan.

Franky noticed cultural differences between himself and his classmates who were raised in the US. He said that his peers in Greece were more mature than his classmates at NJIT. He also noted that because of his time in community college he is two years older than many of his classmates. He commented on how he tries to fit in, but feels different. He sometimes found it hard to work with other students, particularly when they played music loudly. He would rather work more on his own.

Franky worked very hard in school and studio, staying up three nights without sleep for the final project. He said his attitude toward work had changed here being more responsible. He felt that he valued Leslie's positive comments because in his country professors were not so communicative in this sense. He loved to do his studio work because he felt the hard work had immediate rewards in results you could see, saying "I am going [to] try to do that whatever it takes. I don't care...at the end you have results. That's why I like the studio"

Jae

Jae is a beautiful tall, slender, young woman. Her looks show her Korean origin. She uses her body freely, using hair tints, clothes and accessories, believing she can still add more attractiveness to her looks. She has a bright smile and each day surprises everyone not only with different hairstyle or color streaks, but also by offering to dye her peers' hair. (As Leslie hypothesized she did with one of her male peers).

She chose NJIT for a number of reasons, including a desire to be in a city after living in the Washington DC suburbs, to be away from home, and because she'd heard that NJIT was a good school in terms of use of computers and connection to the internet. She liked the program at NJIT, but complained about the confusion and disorganization
regarding the materials list that new students were given over the summer and at the beginning of the school year. I believe that the reasons for going to college explain her partying attitude that along with her lack of discipline jeopardize her goals to study architecture. Her preference to work alone contrasted with her urge for socializing.

Jae was born in South Korea and had no previous college experience. She took four years of architecture courses in high school, including technical drawing, engineering, and interior design. She has a passion for architecture, but also finds it hard to study. She remembers always loving to go into new houses and seeing where everything was. She also took an aptitude test in ninth grade that pointed her towards architecture and science. She enjoyed the architecture courses she took in high school.

When she imagined herself as an architect, it is as a professionally dressed person carrying blueprints talking to construction people. She likes contemporary design and hopes to design houses and potentially a landmark. As does Dhamandeep, Jae relies on her aesthetic eye or sensibility to form, she appreciates and looks for originality. She was the only student that mentioned aesthetic displeasure about the studio space and the views they had from the windows.

Jae had some concerns about time management and her tendency to procrastinate. She said she procrastinates when she is discouraged. She says she tries to make her architecture courses a priority. She is 19 years old, the same as Franky. However, in contrast to Franky’s determination to succeed “no matter what it takes”, her personal insecurities impede her from doing the level of work she could be doing given her preparation and aptitudes. She was the eternal procrastinator, getting away with the minimal amount she could do with her talents.

I believe that Jae started to understand her reasons for procrastination. She shared that she was “all happiness” when Leslie chose her first exercise for the first freshman review. Later, she still held the assumption that creative ideas just happen, without the hard work. Since that easy success obviously did not always happen, she procrastinated from doing her work and feared the failure she would get for not working.
For her it seemed that the idea of flunking because she did not do her work was less damaging than if she did present a project that was not as good as her successful one. Leslie tried to help Jae with her particular struggle and she applied both flexibility and discipline to help push her out of her procastination cycle with a minimal success.

Josh

Josh is a young man with a sport body look, the only one in this studio with an earring. Besides this distinguishing feature, he blends in with the rest of male students responding to the middle class, white American stereotype. He is tall, blond, and dressed as any conventional eighteen year old. He is quiet and timid in his interactions and verbal expression. He does not seem too motivated to work in the studio, even though he keeps his assignments more or less up-to-date. Josh lives in Bayonne, New Jersey and is one of the commuters to NJIT. He had no previous college or architecture experience. He said that his interest in architecture came from his attraction to structures and how they’re built and always enjoyed art and drawing. In the past few years, he had become interested in computers and spends much of his free time working at home, either on the internet or using computer art programs to do 3D artwork.

Josh commutes to school and spoke of the limitations on his ability to stay late to work in the studio though he said he enjoyed the NJIT program. Like other students who are not so motivated, Josh found the studio hours to be long. He finds himself not knowing what to do and gets bored. He was the only student who said he had not thought about his future as an architect but imagines working for a big company, spending time in an office doing models and plans for different clients. It caught my attention that when referring to studio work, he was the only one that only mentioned drawings not projects. He seemed to have a hard time in recalling what he liked best because he didn’t remember anything important for him.

As with most students, Josh cared about the opinion his peers and professor had about his work. He was proud of his drawings, because on occasions his peers found he did a good job and expressed admiration for them. He recognized that he is
stronger in drawing than model making and that he needs to work on that. He also thought that he needed to work on opening his mind to different possibilities for structures, rather than getting stuck on only one possibility. Josh could be categorized as a linear thinker. I believe this is a serious problem in studio work for beginner students. One of the biggest pressures they declared facing was to come up with as many ideas as they could. When students learn to acquire this skill, they increase their self-assurance and general performance. Josh identified this as an disability which caused him distress and failure to complete the project. He reported that Leslie pushes him towards looking for other ideas "I think it's good. It opens up your mind to a lot more choices".

Justin

Justin is a young man with a small body, fine features, and a round face. He has brown eyes and very short brown hair. He is assured, extroverted and has friendly manners. He was the only student who labeled himself as creative and expressed assurance in his capacities for design. He is eighteen years old and lives on campus. He had no previous college experience but in high school he took drafting and drawing classes.

Justin's motivation for being in the architecture program came from growing up with a father who is a surveyor. His father's relations with architects allowed him to get acquainted with the profession. Also he shared his enjoyment of drawing. His father had encouraged him to get into surveying, but he said it did not work for him. He recognized that being an architect is difficult and very time consuming. He imagined himself drawing houses, maybe doing landscape architecture. He prefers rural and suburban settings to urban settings. He would like to have a combination of drawing time and time out in the field.

Justin was a pledge in a fraternity house, an activity that required an hour a day. Managing his various time commitments was a challenge for him. In addition to his three architecture courses, he had Math, English and Freshman Seminar. He was also the only
one who expressed his appreciation of having former friends as studio peers. He thinks they are lucky to be with each other and to have Leslie as a teacher. He said that which pleased him the most in studio was to be able to be with his friends and to have a good teacher. "I guess we lucked out, we got a good teacher. We really lucked out"

Justin and Jae were the only two students who complained about the physical conditions of the studio. Jae emphasized her dislike of the aesthetic aspects and the view from the windows. Justin was bothered by the heat that could not be controlled and his desk that he said was the worst in the studio.

I believe Justin's background, self-assurance, and previously developed communication skills have facilitated both his initiation into design problem-solving and his socialization into the architecture culture. Having a father who is surveyor who worked with architects introduced him to the language and familiarized him with an insider's view of the trade. Franky, also, has a cousin who has his own architectural firm in Greece and an older cousin studying architecture at NJIT. This helped Franky learn about the tricks and hard work of the program.

It is interesting to note that both Justin and Franky, who had more exposure to the architecture culture, were the ones who made some acute observations about the studio dynamics. Among others, ones about why they believed Leslie was a good studio instructor.

**Matt**

Matt's trimly cut mustache and beard make him look older than his peers despite his being the youngest of the male students. He is shorter than his peers. He moves assuredly in his strong muscular body. As with his beard and mustache, he pays attention and care to his clothing. He dresses himself with unusual elegance in relation to the studio group and to the rest of the students in the school. He always liked to do hands-on things and used to draw when he was younger. What attracted him about
being an architect was "[H]aving something that's it's showing your creativity and it's something that people will look at... and admire it".

Matt was born in Elizabeth, New Jersey and with seventeen years old is the youngest of the male students of the group. He commutes from Roselle Park, New Jersey were he lives. He had no previous college experience, but studied one year of mechanical drawing in high school. He commented on the disadvantages of being a commuter, especially the amount of time he spends driving in traffic and his inability to go home for a short time during the day. Matt noted the difference between college and his previous schooling, saying it was hard to adapt to the new expectations of college and the architecture program.

His studio experience was a difficult one for him, having to deal with personal conditions which placed him at a disadvantage with respect to the rest of the group. He is very quiet and found it more difficult to communicate with Leslie than with his peers. Despite being the youngest he demostrated great awareness of his personal problems. He acknowledged having a lack of self-confidence and communication problems as well as an inadequate preparation in graphic skills in relation to his peers. This situation made him nervous and then it was harder for him to talk about his projects, especially with Leslie. Despite all these odds, he liked very much being in the program and was conscious of its demands. He was aware that people progress at different paces, and that in his case he needed to put more effort than other students.

From the whole group, the two youngest students Alana and Matt, both without training in communication skills, were the ones who complained about not receiving enough attention from Leslie. In the second interview, Matt acknowledged that probably it was due to his difficulties expressing himself with her. Other students mentioned that Leslie after pin-ups or group reviews gave grades that she did not disclose, but Matt was the only one who said that among his expectations was specifically to get a good grade. In addition, he was the only one to report his worries about Leslie getting mad at him for being late one day. At the same time he acknowledged that she did not get mad if you did not do what she says or do it right.
In my opinion, many elements in Matt's story depict his feelings of insecurity. He emphasizes in different ways his awareness of his situation of being behind the rest of the group. He gave great importance to external approval (fear about Leslie's reactions, about not being special for Leslie and about peers' opinion) and rewards (grades, being an architect so people will admire his work).

He said that his confidence and communication skills have improved: "I'm able to describe my projects a lot better." He shared that what he felt was a negative evaluation on Leslie's part was probably because he did not respond back to her, telling how much he had worked when she said that he had not. He commented on his work and how the hard work and time put into it makes him proud of himself. In addition, he gained confidence that if he has worked hard, even if the teacher does not like it, it could be the start of something that could be worthwhile for him.

Matt was one of the students who came into this studio with many unfavorable conditions related to his personal maturity, social skills and previous preparation. The challenges he faced and was able to overcome in the studio made him jump into a more optimistic and responsible attitude to continue his architecture studies.

Sean

Sean is an athletically built, white, young man, with a harmonious adolescent appearance. He dresses in a conventional white, middle class style. He is timid and even though he looks serious, he is one of the ones that like to "fool around in the studio". He is eighteen year old and lives on campus at NJIT. He was born in New Jersey and had no previous college experience. His architecture courses in high school included studying computer aided design and he had the opportunity of helping design a house that is now being built, and helping build two other houses.

Along with course work in high school, Sean has been involved in building a number of things with his father and grandfather. His father wanted to be an architect, but never went to college. He said he is enjoying the architecture program, particularly
drawing and making models. He expected the program to be harder than it is, although he said he feels challenged.

In terms of his future as an architect, Sean imagined himself staying locally to be near his family and being involved in building houses. He imagined he would start out in a firm, but eventually having his own. He is one of the few students who had previous exposure to architecture-related practical knowledge, being involved in construction and remodeling of houses with his father.

As with Dhamandeep, he expected architecture studies to be harder than what they were for him. As well, Sean and Eric were the two students in the group who said that they did not stay up late finishing studio work. Sean did not seem to take his work with as much passion as Steve, Eddie or Franky. As Eric did, Sean applied his own organization system to keep up the studio work and the assignments of the other courses.

In the same line of thought as Josh, in discussing his achievements up to this interview done at the middle of the semester, he did not refer to his creative process but to his model-making skills. He did not seem as enthusiastic as other students about his advancements. Sean gave me the impression of being an average student, who had good high school training and balanced personal skills that allowed him to perform well without much effort. Up to the mid-semester time, his opinions about other aspects of the studio dynamics corresponded with things said by other students in the group.

**Steve**

Steve is a blond, tall, strongly-built young man. He has very short hair and dresses as an average college student. He is the only one with eyeglasses and who isolates himself with a Walkman doing his work in the only studio corner enclosed by walls. He seems to be a self-centered individual. As a hobbie, he likes to go mountain climbing. He is eighteen years old and also lives on campus. He was born in
Morristown, New Jersey and had no previous college experience, but studied drafting and architecture in high school.

He commented on how he chose architecture, saying that his drafting and architecture courses were really fun and that it was a way to leave your mark on the world. Steve said that the campus social life is not very good. He attributed that partly to the long hours he spends in studio. He has not been concerned about security on campus late at night, but had some problems off campus in Newark. He worked hard, spending long hours on his studio work, often staying up late at night.

Steve had previous experiences with teams as a Boy Scout. He described the program and how he taught people how to work in groups. His experience with the program taught him how to cooperate with other people to get a project done. Despite this previous experience, his conduct in the studio was among all the students the most self-centered and unresponsive to other people's needs, sometimes trespassing the line of appropriate social behavior.

Steve certainly learned from rock climbing a strategy to challenge himself and to boost his self-esteem and autonomy in other realms of life. I see how this particular dynamic embedded in his personality has had both a positive and negative effect on him. Alexis and Steve are the two students who were more expressive in articulating their strong feelings about their design work. He is very determined, likes to challenge himself but also as he recognizes, he likes to bend rules to get what he wants. These beliefs contradict previous experiences he had working in a Boy Scout team, in which he had training in group dynamics and group leadership.

In Steve's case, this isolated way of building self-esteem has been his psychological tool to deal with the difficult adjustment to college life and architecture. He was the only student that made the parallel of studio to a home. What has proven successful for him in rock climbing I believe has had detrimental effects in his learning process in studio. He is a motivated hard-working person, but his self-confidence
became a defense mechanism for his insecurities in several ways impeding him from using his talents in a more positive way.

Even though he said he appreciated the studio atmosphere and his peers, his design work interactions were limited to the ones with Leslie. He projected his lack of interest for his peers' work, saying that they did not pay attention when he was talking. No one else said that. He said he fell asleep when they were presenting their work. Steve and Jae were the two that felt more comfortable isolating themselves to do their studio work. He only valued his peers as play companions. At the same time he made off-limits jokes or dismissing comments to them. Some students of the group complained about Steve's behavior, which was sometimes intrusive and included careless handling of their recently glued models. I believe it was due to his insecurities that he acted out a compensatory mechanism showing these signs of false self-assurance. He has taken the role of the bold joker of the group, sometimes "bending rules" of adequate group behavior. This characterization has led him to the point of making disrespectful comments about Leslie in front of the whole group, despite his high appreciation for her.

This account of all the students, except the one that did not participate in the study, introduces the following section describing the most relevant aspects of the studio dynamic. In the studio themes I have included quotes from students and Leslie to reconstruct both her studio pedagogy, built from her beliefs and objectives, and the students' first semester studio experience learning the basics of design.

The Dynamics: Studio Themes

My participant observations and interview excerpts were the basis in this section to portray significant themes from the students' perspective. I looked into Leslie's interviews to find the pedagogical motives or reasoning that guided attitudes, actions or activities that students recalled as important to them in the process of learning to design. I believe contrasting their reconstructions and ideas we can better understand students' discourse about their studio experience.
I have seen the life dance of the three Leslies, each one moving in her own particular realm. Leslie the feminist is the lighthouse inspiring her actions. Leslie the architecture scholar offers a locus for her inspirations to take form. And Leslie the teacher integrates, through her own passion for teaching, the driving forces of the three of them.

The overall studio dynamic emerges from the interaction of students' individual and diverse backgrounds with Leslie's three facets. The uniqueness of each of the students, amid the different learning situations in the studio, provided a rich universe upon which to draw. The studio themes in Table 4.1 give an accurate, though very limited panorama, of this design studio experience of Leslie and her students.

Table 4.1. Studio themes.

<table>
<thead>
<tr>
<th>Pedagogy to achieve the design studio &quot;know how&quot;</th>
<th>Building confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group networking</td>
</tr>
<tr>
<td>How far can first semester students handle cooperative practices in the studio?</td>
<td>Interaction for creation</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquiring the design studio &quot;know how&quot;</td>
<td>Initial baffling days</td>
</tr>
<tr>
<td></td>
<td>From &quot;where are the ideas&quot; to &quot;there are ideas everywhere&quot;</td>
</tr>
<tr>
<td></td>
<td>Discipline and play</td>
</tr>
<tr>
<td></td>
<td>Socialization tools: learning the language and appreciating design</td>
</tr>
<tr>
<td></td>
<td>Finding their own method</td>
</tr>
</tbody>
</table>

120
I submitted these descriptions for a member check review by Professor Weisman during the data analysis process for accuracy in the portraying of the studio dynamic and profile of the student participants. Her her revision and suggestions were extremely valuable in the final organization of the materials.

**Pedagogy to Achieve the Design Studio "Know How"**

In tune with Leslie's feminist principles described earlier (see Figure 4.2, Objectives of Leslie the feminist), students' empowerment was the developmental objective to facilitate the learning of design skills. Leslie's intention to share authority and knowledge and to use collaborative learning practices were ways of contributing to students' empowerment. This objective was promoted by two distinct realms of actions: building confidence and group networking.

**Building Confidence.** Leslie believes that in order for her to be a good teacher of architecture students, the main purpose of her studio interactions with them is to empower them to be more successful in learning design skills. I observed how Leslie stimulated in her students two interdependent processes: building confidence and learning design skills. Students need confidence in themselves to be capable of fully engaging in the learning cycle. At the same time, they need to feel pride in the projects they create to build the confidence needed to engage deeply in the creative process.

The success of this learning cycle depended on both Leslie and the students, who had to take an active part in the process of working on their assignments. Leslie took great care to stimulate them in such a direction as to create a supportive learning atmosphere.

In the studio dynamic, she encouraged their awareness of their capability and confidence in their own resources. This psychological support ran parallel to and conditioned her instruction of students in architectural skills and culture. At the same time, she motivated them to acquire the habits and discipline required for studio's hard work.
The attentive encouragement of awareness of their process was done by Leslie with care and respect for their ideas, producing a sense of ownership of their work. This support helped build an upward spiral of students' personal empowerment.

(Leslie) I don't think you can design anything without a certain sense of self esteem, because it's very tough and you are always anxious. Is it right, is it wrong, is it better, is it not as successful? It's a subjective process... And certainly it takes a lot of courage to be an architect. An artist can create a painting for painting's sake. A building has certain responsibilities that go beyond the fine arts...legal codes, life safety issues, functionality.

....[T]o me it's really important that each of my students feels, by the end of the semester, that they have an awareness of both aesthetics and ethical responsibility for others, something of substance in that they identified [with], and that they see some level of personal development.

The process of building confidence, as Leslie sees it, is not only about assurance of students' capability to design. What is central to this objective is their own identification with their unique process of construction of knowledge. This studio's cognitive objectives were thus expanded into the psychological realm, enhancing the developmental process of students as creative individuals. By encouraging students' appreciation of their work, an affective link was created, contributing to their confidence and intellectual security. As happens in many studio groups, students arrive with great differences in skills, talents, and personalities. In this case, the group had individuals with diverse backgrounds, differences in training, and contrasting psychological conditions. The diversity in students' backgrounds, training, and personalities made Leslie's difficult task even more complex.

Most of the students shared in the interviews the strong sense of insecurity and inadequacy they felt at the beginning of the semester. This aspect will be expanded in the subtheme "Initial Baffling Days" later on in the chapter. They reported how at the end of the semester they all felt more secure and confident about their capabilities and enjoyed their studio work. All of the students reported how Leslie had helped them in different ways to feel more confident, assured and more motivated toward their work. As a consequence, they could achieve results of which they felt proud.
(Alana) I'm not as afraid [now]. I was very intimidated in the beginning of the semester. I loved this semester. It flew by. I look back on it and I loved all the projects instead of like the first time I looked at them.

Leslie's way of building confidence was imbedded in the whole studio dynamic. From students' comments, I have selected examples that were shared by most of the students. These were their sense of being special, feeling that all of their ideas were valuable, that they could take risks, and that Leslie would be there, attentive and helpful, whenever they needed her.

From the beginning, Leslie made them feel they were unique, special individuals. All of their ideas were important. The feelings of insecurity at the beginning of the semester that they shared made me recognize how Leslie's motivating, non-judgmental attitude contributed to the change in students' feelings about themselves.

Leslie's strong interest in design and for encouraging the generation of ideas in her students was conveyed mainly through her attentive and motivating attitude which strongly stimulated students to draw ideas from themselves, as most of them shared candidly.

(Alexis) She goes around and comes to your desk. You'll tell her what you did and why [you] did this and she starts talking. As she talks, it's like things...light up. You just start to see things...she gives her feelings. I get more ideas from sitting and listening to her. She'll say something and I'll be like "oh, I can do that, let's do that" and it just gives me more.

In Leslie's way of teaching, any time students proposed an idea which seemed not appropriate or which did not make sense to them, she did not discourage pursuit of it. Rather, she encouraged them to explore it further and to discover qualities which were probably not initially apparent. This was always done in an enthusiastic, never condescending, manner. She was truly committed to their explorations of ideas, acknowledging their validity and importance because these ideas were theirs.

(Dhamandeep) I don't know how my professor taught us [because] everybody has a different design. Everybody has [a] different thinking, and the design comes from your thinking, right? The way I design is different from other students. Probably they don't understand my design and I don't understand theirs, but it's not right or wrong. It's just yours, it's what you created.
Some of the teaching interactions were directed to mirroring students' own processes and the qualities of their projects, helping the students understand how they did their work. Her interventions, more reflections than critiques about their projects, were extremely valuable for students encouraging them to be more perceptive and better critics of themselves for future projects. She would start by asking them questions or looking at their journal entries. Initially, she would articulate for them traces of their process, checking with them the phases they had gone through. Depending on how clear the student was about the project, she stepped back in the effort of making them more active in making sense of their processes. Learning to articulate their steps in the exercises, without waiting entirely for her critiques, increased their confidence in their capabilities to move forward and also to comment to peers' projects.

(Alexis) Something that Professor Weisman always says "Think of your previous projects, and see if there's something that you liked about them or something that inspired you and work from there." ...a lot of times that's what did it.

Leslie sometimes would remember things about one student's exercise that she or he had missed recalling. This review of past processes and results helped students clarify the phases they had gone through, allowing them to see new paths or review others that were stated though not explored. Most important of all, it made them value the work that seemed unimportant as a important part of their process and something upon which they could build.

At the same time students, feeling safe with Leslie's critiques, gained the power to take personal risks and go further in the exploration of new territory. They felt supported in their experiments, no matter how crazy their ideas initially seemed to them. Some of the occasions on which this process of gaining self-assurance occurred were shared by students.

(Steve) I'll come up with an idea and I'll say "I'm thinking about doing this and this and this." And she'll [reply] "Go ahead and do it." It won't be, "Nah, I don't think you should do that. I think you should try this." It's more like "Go right ahead and do it....So you want to change it? Go right ahead. Just whatever you want to do. Go right ahead." It's always "Go for it." She's always like gung ho about it. Never, she never slacks off. Always going around, doing stuff. She's great.
(Matt) She doesn't just give us the problem and let us do it by ourselves. She is along with us to help us. She guides us in the right direction. Sometimes she'll say something that makes us think, tries to make us think more on our own, too. So it's like she is trying to get the most out of us without her teaching as much. So I think it's good the way that she does it and the way that all good teachers do it.

Leslie made her students feel that in design there were no errors, only explorations that did not fit the particular exercise conditions, but that might be useful for other projects. One of the clear messages Leslie communicated was that there was no such thing as a bad idea. Thinking that all their ideas were valuable helped alleviate students' tension and increased their productivity in the struggle to come up with new ideas for their projects. Students felt proud of their work and this in turn motivated them towards more work.

There were other confirming signals that contributed to each student's self-confidence in seeking different solutions. One of them was the emphasis Leslie placed on their process and not solely on the resulting product. One of Leslie's requirements serving this purpose was to ask students to keep track of rough sketches and written ideas in idea journals. In each desk critique, she asked to see their journals and demonstrated to them why the annotations were not an idea archive but a way of documenting their processes. She showed them how this could be useful to develop new solutions or to follow their own problem solving process.

Through the use of the journal Leslie taught her students, as well, a way to mirror their own processes by themselves, not depending only on her desk critiques feedback. In one of these critiques, if students had not been able to come up with a proposal through a model, they would show her their journal annotations and she could work with them on the basis of their previously noted ideas. If a student came up with an advanced model without supporting evidence of their developmental work, she would pressure them towards further explorations. She was not willing to accept a solution that could meet the problem's requirements but that was not revealing of their personal processes. In the pin-up or group review sessions, students who were asked to present all the study models they had made previous to the one they were presenting.
A general system of recognition of first semester students is the freshman review. Every two weeks, two or three projects were chosen to be presented to all the studio groups. This functioned as another type of validation for students about what each of them could produce. Alexis and Steve described how the system of choosing two students each time was motivating for them. Everyone had the chance to be chosen, promoting, as well, some competition among them.

(Alexis): After all that work and I'm proud of what I did, then [is] good [to be chosen] because it motivates me to do another project. The last two of mine got picked for presentation I think that's a good idea because especially it rotates. Everybody pretty much gets a chance to like get picked, so everybody gets that motivation. I think it works out well.

(Steve) In the exercises, I try and get it the best I can. I want to get picked. I really work hard at it [The choosing of the projects for the review] almost like it promotes a little competition, little.

I think that Leslie used criteria other than the aesthetic/functional product orientation more typical of studio teaching. Steve expanded on how Leslie chose the projects emphasizing the process students had used. He noticed that in the internal review, before choosing the projects, she was very attentive in pointing out things students did not address in their projects or those on which they did not comment. This emphasis done at the end of each exercise paying attention to their processes was a way Leslie had of driving students toward awareness of their reasoning and to clarify the motives that led them to their solutions.

(Steve) She doesn't usually choose what [i]s necessarily the best solution. She wants to put in diversity and whose idea is complete and thought out well...she goes more by that rather than where somebody else may say that is the best solution. She goes more along the lines of "I really like this thought process. You worked hard and [your] theory is thought out well". I think that is the way you should do it. If I were a professor I think I would probably go along those lines. She is always watching people seeing who's doing what. If you slack off she notices by the way. Nothing slips by her....

Leslie's one-on-one interactions with her students, which could appear to be similar to the studio dynamics used in other groups, had distinguishing features. These differences were the attention to students' personal development and the emphasis on the process rather than on the product. Building confidence in students meant, as well, building a good rapport with Leslie as the main interlocutor to discuss their ideas.
Leslie's concern for her student's humanity and the development of their full potential was reflected in the attention and care with which she responded to the psychological conditions of each of them. All the students in the group shared how Leslie was attentive to their needs and was interested in what they were doing. They noticed that she stayed in the studio the whole time and did not go away and let them work by themselves as other professors did. Eddie, Jae, Matt, and Alexis spoke of different ways in which Leslie expressed her care.

During this semester, she gave Eddie an extension of the time limit to finish a project because he had severe family problems which impeded his finishing.

(Leslie) I mean Edward is 20 years old and everybody thinks of him as grandpa. He is also taking on all the responsibilities of his family. Right now they are in terrible crisis. I have already spoken with him and I will make sure that he gets a formal design review somewhere, somehow. That his personal crisis does not have a negative effect on what he deserves to learn.

Jae said that the best thing about studio is Leslie. Even though she had seen Leslie's tough side, Jae felt Leslie understood and greatly supported her.

(Jae) I was pacing one time because I couldn't get an idea straight. So I was pacing around the studio. I was going outside, just all around the place. I wouldn't sit down. And she came to my desk finally. And I go "Look, I have nothing. I can't think of anything." And she's like "I know. That's why you're pacing so much." I said "I can't think and I don't have anything." And I'm feeling very nervous. And she said "Yeah, I know. You just have to sit down and think." She's like "I know why you're pacing. I know why you don't have an idea." "Oh, you know?" And she's like, she's so great about it. She's so great. Just love her.

Matt and Jae felt Leslie valued their effort, even though they thought their work was small or did not get to the point it was supposed to. They felt she appreciated when they worked hard.

(Matt) It's kind of a fear of not, not wanting to start it because you're just afraid of what the outcome might be, what she's gonna say. But I try to work as hard as I can. And whatever she does say I can handle. The more you try the more that won't happen where she's not gonna like it. She's gonna see that you're trying and that's more beneficial if she sees that you're trying and you're working hard to think it through, than you're not working hard, not giving that much effort.
Also Alexis said Leslie cared until the end of the project. She believed that due to Leslie's pedagogy she had become more aware and confident in her design process.

(Alexis) I know we're gonna get an assignment and I know the process that's gonna happen. I know that, I'm going to think of an original idea and Professor Weisman is gonna come around, and she's gonna give me some ideas. We're gonna analyze and I think and get more ideas. She's building until you're at your final thing. It's not hard anymore. It's just time consuming. I enjoy it. I just wish I had more time in the day.

Besides the usual verbal explanation orienting them to the exercise, for the last exercise of the semester, Leslie gave the students a very detailed timeline up to the end of the semester, reminding them of activities and tasks they had to do before the final presentation. These next comments refer to what Leslie was planning to do for the end of the semester. She implemented a mini-group session so they would help each other prepare their final presentation. She also had an internal review with guest jurors as a practice for the final review presentation, which would be their first experience with all the first semester studio groups.

(Leslie) Since they[students] really haven't presented their own work to people outside our class as yet on their own, I mean with me sitting down and them standing up in front of jurors, I thought about having an informal interim or practice review, in which I invite second and third year students, the better ones, my former students who are hanging around me and my current students all the time, to be the jurors. This final product is very modest in scale and scope. They could handle being critics on a project of this type. I'm fascinated with the possibility. At some point soon I'm going to try this, because I'm very interested to see how this might work. But you have to pick the right students really carefully. And it has to be on an informal basis. This could be a supportive way of preparing them for the final all-section review in which two students from each studio will have to face a formal design jury and do so in front of a hundred other students and all the studio faculty.

This example gives the other side of the the student-centered model of interaction Leslie created in the studio. Despite this emphasis, she exercised as well her power as a responsible instructor creating a safe working structure and a clear direction for her students at all times. Besides being what is expected a good professor to be, knowledgeable and responsible, she encouraged students to tap into their own resources rather than impose her design ideas. She introduced within the group a different power structure dynamic. Sharing knowledge as a co-explorer of students' ideas was basically the way Leslie had to share her teaching power in the studio.
Students' empowerment went hand in hand with group empowerment. Making students respect and value each others' input was the starting basis. Leslie tried to balance in some way the strong emphasis of the one-on-one interaction, the core of the design teaching-learning process, by encouraging group networking as an initial step towards collaborative learning.

**Group Networking.** From reviewing Leslie's writings and articles about her, I learned about the pro bono design services she provides to non-profit groups dedicated to improving the quality of life for communities and, particularly, marginalized or disenfranchised groups through her service-learning upper division design studios and lecture courses. (De Luca-Dicker, 1993; Weisman, 1996a; 1997). These innovative educational initiatives have received recognition by the architectural press, the AIA, architectural educational institutions and by community-based groups she serves. In these courses at NJIT, she has been able to meet the goals of her feminist ideals, her interests as an architecture scholar, and passionate teacher.

Leslie believes that collaborative design/research studios are premature for first semester students. There skill levels would be inadequate to contribute productively to the needs of real clients and to address real problems. Whereas Leslie does not employ the same methods and content in first year studios as she does in her upper division courses, she continued to experiment and push forward studio initiatives that favored group networking and cooperation among students.

As with her beliefs about students' empowerment, Leslie's encouragement of cooperation in studios is not a standard practice in traditional studio settings (Dutton, 1991b). In this group, she instilled principles of cooperation through constant reinforcement, primarily through her comments during the different studio activities. Her critiques, always validating the uniqueness of each proposal, were also used to point out ideas that connected students' projects with one another.

(Leslie) When that kind of dynamic takes place in the classroom, then even if they see somebody else's work is better than theirs, they don't feel personally rejected, I also use other students' work as a way of basically pointing out high
standards. It's fine to say "Look what so and so did". They [students] are not stupid. They can see when a project is well done, and I think it's helpful to formulate group awareness of what we would consider to be better work.

In addition to verbal input, she promoted studio interactions within her group that formalize in some way her convictions about sharing her authority and knowledge. By doing this, she acknowledged the value of what students can give one another. In this way, I believe Leslie was planting seeds for later collaborative experiences, encouraging openness and cooperation instead of indirectly allowing a dynamic of distrust among peers to prevail, as usual studios promote (Anthony, 1991; Diaz, 1997b).

(Leslie) I will actually ask certain students to go and help other students with their drawings and models....frequently I would say "Go look at so and so's work and see how they drilled that particular hole." Ask them to take the student to the other model shop to show them what they just learned. Tell them share materials and pay each other back later, so one doesn't have to go running off independently and wait three hours in search of a particular kind of paper that they don't have.

Through these apparently small deeds, she believes students begin to trust and value what their peers can offer them.

(Leslie) What I don't want them to feel is that they have nothing to teach each other. The origins of collaboration are in respect for each person's expertise and wisdom. And so, if I can now help them to see that, each of them can be a teacher in one way or another, then they'll begin to not feel as though when they make a design decision they have to cover it up with their arms so no one sees it, lest they be copied, lest there be plagiarism or stealing.

Many students' comments corroborate that this studio goal was fully achieved. Alexis expressed her connection with her peers in the following manner:

(Alexis) I have friends that I'm closer to but when we're in the studio we're all friends in that studio. We always ask each other. Like if I want to take just a breather for a second to stop, I'll go from desk to desk and look at what everybody else is doing. Just talk to everybody. [I would say]. Do you like mine?

Alana found support from her classmates, support which she valued and which helped to build the bond among the students. Sharing her expectations for continuing together in the future Alana shared that "with our peers, we've come so close...we don't want to separate the other semesters".
Besides her attitude translated in suggestions to help each other with studio tasks, Leslie encouraged group bonding within common studio practices, such as pin-ups or group reviews. In addition, she explored cooperative practices as inviting former students from higher level studios to their group reviews, and even suggesting study dates.

Leslie believes that commenting on each other's work helps students to observe better their own work and begin to develop their "critical eye".

(Leslie) I often begin by asking each student in the class to pick out a project done by someone else and to explain why they like it. I ask "How should their choice be compared with other projects?" I guide them through a series of questions. And they respond. They start, looking, analyzing, thinking, actively engaged rather than simply listening to me and falling asleep. A group review is a way of sharing lessons, of getting them to see how two or three models that look totally different are really exploring similar issues. So that they look beyond the appearance or geometry of the design to the principle, the underpinnings, the design concept, and not just the superficialities of the visual. The goal is to develop analytical awareness and thinking and a critical eye.

To get students more actively involved in critiquing each other's work, she thought of different ways to improve these kind of interactive practices in ways that make them comfortable.

(Leslie) I might break the class down into groups of three and ask them to sit with each other and talk about their work. And then ask one person from the group to present somebody else's work to the entire class. This requires really listening to each other well and hones their verbal skills.

Pin-up and group reviews were not welcomed by all students in the way Leslie expected them to be. Some of the students acknowledged their benefits, while others found find them difficult to follow, especially when they had not had enough sleep. Other students, including more self-centered ones such as Steve, preferred one-on-one desk-critiques to having to deal with peers "seated in a circle" in which each person becomes the center of attention at one point.

Leslie also quickly invented ways of transforming a failed homework assignment into a successful cooperative exercise. In one of the studio sessions, not all of the students brought the three drawings Leslie had asked them to bring to use as the starting point of a project that was to be worked on during that particular session. When
she asked why, she discovered that they had been studying for a math exam. Leslie approached the problem in a quick and positive way, creating a different modality for the exercise. She didn't punish or complain, but simply moved on creatively, resolving the impasse. The result was that students' outcomes were better than they probably would have been if the exercise had been done as initially planned. Also, students received a valuable lesson about creative process. They learned firsthand from the professor how to solve problems flexibly by incorporating a different strategy or method when the first approach was not working.

(Leslie) When the students pinned up their drawings, most were really lousy. Many students didn't do any work. Alana had done three beautiful drawings. So had Dhamandeep, who has an incredible innate sense of composition, and great hands graphically. I wanted to reward these students and to praise them publicly.

Leslie asked these two and a few other students for permission to make xerox copies of their drawings to share with the students who had not brought any to class so they could all do the work as planned for that day. The exercise required using a black and white drawing as a "floor plan" from which to interpret and project a three dimensional model.

(Leslie)...[A]s I brought the Xeroxes back I noticed that some were disappointed, that they had not done their own drawing or [they] didn't know what they wanted to choose. I said "Fine, you don't have to make up your own drawings right now."

This class activity exemplified how Leslie was attentive to each student’s circumstances and abilities and pushed them to do things that could become successful experiences. She knew that Matt had poorly developed skills, making it harder for him to keep up with the level of the group. So, for this exercise, she gave him clear instructions to explore solutions, guaranteeing a certain level of safety for him.

(Leslie) [A] a couple of students [who] really do not have great compositional abilities grabbed like crazy on those other drawings. And probably [did] one of the best models they have done, because they had a good datum, a good foundation from which to explore issues. For example, Matt is one of them. He used Dhamandeep's drawing. He would have never come up with a composition that well integrated. I said "Interpret this three- dimensionally, as a series of pure geometries. You change one variable, elevation." "You are going to make some rules for yourself for form making". They are very simple, very specific rules so
that one clear lesson powerfully can be visualized through this process. And I think this was a very successful project for him. He's getting better.

She gave clear explanations about the advantages of the sharing, without forcing them to accept her suggestions about group cooperation.

(Leslie) I asked Eddie "Are you okay with this? I mean, do you feel comfortable allowing other students to use your drawing as a basis for their own design? It's a generous thing to do, and each student will develop the project differently. It will be quite interesting to be able to compare the two models and how each of you took the same ground plan and really developed it quite differently. We will learn so much more together by being able to compare." And they got that right away.

It was interesting to observe how she used "we" on many occasions when referring to one or several students' process. This was part of the on-going reassuring discourse which challenged the traditional power structure in studios which separates teacher and students. She continually transmitted the messages: "we are all equally involved in this exercise", and "we are all learning from this."

(Leslie)...[T]hey understood that in collaborating or cooperating with each other, the whole group could benefit from more information. It was spontaneous and it was gentle and it was non-demanding. And they had all kinds of back doors if they wanted to [do] otherwise.

This exercise demanded that Leslie deal with interpersonal issues among students and their own boundaries. Leslie's attentiveness again, her openness and respect for them, encouraged students to accept her suggestions, stretching their limits. The success of this activity served to exemplify a group empowerment situation. She taught students how to make better use of their own resources, without dismissing their lack of skills, how they could collaborate with each other's learning process, and how the whole group could benefit from this, including herself. In this way, she shared her power, giving students the opportunity to build upon each others' strengths.

In other occasion Leslie was worried that two students were not keeping up with their work and she thought that she could push forward peer tutoring between the two. The way Leslie communicated her message to this pair of eighteen-year olds was by suggesting a study date.
(Leslie) I went and took [the student] aside and said ". . . you two [he and female student] clearly are friends...do me a favor. You are a slow starter, too. You are not doing yourself any favors here by avoiding the assignments until the day before they are due. The two of you are both procrastinators. Why don't you two help each other? Why don't you give her a push? Why don't you...go out on a date and study. Work together."

Leslie chose this decidedly unconventional approach to try to help both students meet their deadlines. She maintained a close watch on them and respected the amount of disclosure they gave her about the way they finally managed to help each other.

(LESLIE) They have been [helping each other]. I know it. I can tell by the results. I haven't asked them. I haven't talked about it. But my instinct tells me that the two of them have talked about this. Because both of them came in with finished work beautifully done. First time. So that's a form of collaboration that isn't visible in the classroom, per se, but it's visible in the work.

Looking for ways to share her power as the main critique source for students, Leslie encouraged, as much as possible, communication between her current students and students in the upper years who had previously been students of hers. She invited two students and two architects to be jurors for the interim review that she organized to be held before the final presentation. Leslie's former students did an especially wonderful job. She gave them warm comments, thanking them and praising them publicly for how they had critiqued her freshman students and how much they had developed their own analytical and verbal skills as students from the time when they were freshmen.

(LESLIE) I said to them "The reasons I want you to come back and be critics in my studios is because younger students will respect your opinion, because you've gone through it, a project you're working on just like they do. They will listen to you. When you tell them to do their portfolio now because they are never going to get it done otherwise, they'll listen to you. You are their peers. You are their role models. And your perspective is more valid than m[ine]."

I was really thrilled to see how articulate and thoughtful and informed my former students had become in two years, and Jean was just beaming this morning [with her positive comments about their interactions with the students].

By choosing students who she knew were capable of doing a good job and who were representative of minorities, she conveyed a powerful social message, not only through her words but through an unforgettable experience for her students. Students
later commented on the excellent work these students did “even better than the practitioners that came as well as guest jurors”.

(Leisure) These are two [former students from the Antilles]. These are both people of color. I said [to them]: “Do you know how important your intelligence is an example to others? Here you are, extraordinarily skilled students. I want to groom you as teachers. I want you to think about using your verbal skills to teach others, because there are so few people of color in practice, let alone in teaching. They hardly exist [in architecture]. Persons of color, male or female, are almost totally nonexistent. It’s less than .2% in this country. If we’re going to talk about a diverse profession and a multi-cultural society, then this [should] be defined by many voices and many colors and women as well, and you represent that.” They just looked at me like they never thought about this.

This successful activity undoubtedly influenced this group of first semester students in terms of the cultural feminist values of working towards a more egalitarian society that Leslie wants to instill in her students. She did not preach about the fairness of diversity, she gave them facts and acted upon what she believes.

How Far Can First Semester Students Handle Cooperative Practices in the Studio?. Both Leslie and students were cautious about group practices which could make designing and personal relationships more complex, especially considering the many hours these students spent together. Not all the students, as I pointed out before, felt comfortable with their peers’ feedback within the studio dynamics. Depending on their personalities and self-assurance, some students preferred more isolation than the gregarious sharing within the studio culture.

Steve, for example, did not trust nor was he as interested in his classmates’ feedback as the other students were. While he shared that he fell asleep in pin-ups, he was resentful about not getting all their attention when he was talking in group reviews.

(Steve) The pin ups are always fun because I sleep. I lay on the floor. She [Leslie] knows I do.

I'm interested but I've seen everybody's work and I know everybody's work. So I lay there and I'm awake half the time. The group crits can be long and exhausting. Alexis was falling asleep today. I was starting to fall asleep, because one person will take 5 seconds and the next person could take 20 minutes, and it just goes on.
He did not dislike receiving feedback from his peers, but he argued that there were too many opinions to handle. He did not feel the advantages of being part of and interacting with a group. His non-appreciative attitude towards classmates made him value more highly his interactions with Leslie. He found that desk critiques were much more productive for him.

(Steve) When she [Leslie] comes around and talks to me, I can bounce ideas that I have off to her right away, and get instant feedback. Whereas with a group crit I can ask for it and get not only hers but everybody else's. But everybody else's will be like more than I need. I only need hers.

Both Jae and Steve, who seemed prone to socializing, also acknowledged how they felt the need to isolate themselves from the group in order to be more productive.

(Jae) I love to work alone. That's my thing. I mean I can cooperate and do collaboration when I need to, but if not I prefer being alone. I don't know why. It's just my thing.

(Steve) I really enjoy working by myself. I find that if I bring my Walkman or my Discman in with me, I just plug in and listen to my music. The time just flies by. I get so much accomplished and I don't talk to people. I become my own little world.

Eddie, on the other end of the spectrum from Jae and Steve, was willing to give help to anybody that asked for it. Nevertheless, he felt that his peers could not give the same depth and level of precision to critiques. He felt his age and previous education placed him on a more advanced level than his classmates. He was considered by his peers as the "official consultant" or surrogate teacher for advice on how to work on their projects in between class sessions. He found pleasure in helping other students with their work. This acted as an acknowledgment of what he knows.

(Eddie) It is not that I am above everyone else, it's that they rely on me for my experience. They think that because I am older that I know a lot more. That may be true, that may not be true. But it feels good when they come to me for help.

When helping students he warned them "I am not perfect to begin with", and saying "...it may or may not work. You just have to work around it". In helping Alexis with her project, what he suggested didn't work. He reflected about this, taking it as a lesson. Helping other students, in turn, added more responsibility to his already packed life, being a husband and caretaker for his sisters. He started to learn how to be a teacher.
(Eddie) I tried to tell her that the solution that I would have for your model, you might not be able to work with. And it turned out to be true...that was probably a good lesson for me. I didn't have any experience with [the sort of design she was doing]. I can help someone out up to a certain point but, she sort of expected me to do it for her..

He concluded wisely about this collaborative experience:

That was an actual lesson for me. That, no matter how much I know, I really can't help them out, I really can't get too involved in their work. I guess my own way of thinking comes into play. It sort of conflicts with theirs. It's a little different.

Leslie was very careful not to ask the students to do things she believed they were not prepared for, such as evaluating each other's work in terms of grades. From the references Leslie has made about the higher level, option studios, she incorporates peer grading along with her own. She believes this can be done in these studios because they are more mature, advanced students. In the case of first semester students, she feels they are not ready for this.

(Leslie) I think that it would be a little bit early for them to say you are formally responsible for evaluating your classmates where it's going to affect their grade. I think that's my job with them.

In response to my question to Leslie about the possibilities of encouraging peer critiques of their projects in the internal group review, she commented:

(Leslie) There's no reason why that couldn't take place, even at this early stage. One of the difficulties that I am aware of is the students' level of fatigue. They are working very hard and they are under a lot of stress [by the other courses' requirements beside studio's]. When they show up, they often just want to listen. They are sometimes totally bummed out, having not slept for days to meet a deadline. For me to ask them under those vulnerable conditions to stand up and try to be coherent about their own work is not a good idea. What I prefer to do is to have work due on a certain day, give them my feedback, and then have them talk after they are rested.

Leslie tried to push students as much as she could to cooperate among themselves. It is understandable that she had to modify her expectations when dealing with students who were facing such hard academic demands and normal adjustments to college life. However, I observed that Leslie was overprotective in some cases, because not all the students were overwhelmed by the requirements.

Leslie's focus on building confidence and a sense of group identity contributed to the students initial learning of the design vocabulary needed in future semesters.
Students had different needs, they came from different backgrounds, with different levels of preparation and skills. In addition, their particular personality characteristics and family/home conditions contributed to making this transition time very different for each one of them. Thus, Leslie’s participation required much attention on her part to try to understand and help each student according to their different conditions and perspectives.

The more motivated students, such as Alexis, Eddie, and Franky, worked harder and dedicated as much time as they could to the studio work. Others, such as Dhamandeep, Steve, Justin, and Sean, coming into the program with a higher level of academic preparation, could work less and did not have to spent as much time as the ones "hooked by design". There are personal differences in each group, all groups are different. The architecture program demands more than other majors. Also it seemed true that the more Leslie demanded from her students, the more they produced. There was a fine line between being flexible and students slacking off in the pace of their work productivity.

What was required for building confidence in these students was not necessarily linked to the level of motivation they had. On the contrary, it related more to the psychological needs of each one of them. One thing was evident, an increase in confidence in their skills and control over their design processes diminished their feelings of insecurity and motivated them to do better work.

In addition to this positive psychological cycle, there are specific variations to mention. Dhamandeep, the more mature individual with well developed skills and an intuitive sense of composition ,enjoyed designing and seemed to be the least dependent emotionally on Leslie’s opinions of her designs. Yet she seemed to depend heavily on Leslie’s direction and comments during desk crits. She emphasized how Leslie’s encouraging the development of each student’s creative potential resulted in such different design projects among them. Also, it increased her certainty that all could produce good responses to the problem.
Matt, at the other end of the spectrum, not only was the youngest of the male students and had an inadequate preparation, but he also had relational problems that made this transition to empowerment more difficult. He was indeed successful, considering the negative circumstances from which he began.

A special case was Eddie, the excellent peer and role model for serious, hard work and rational and logical thinking. He thought so conscientiously about each project and idea that it was hard for him to respond to Leslie's suggestions that he pursue a variety of design strategies before latching on to one final scheme. He was occasionally frustrated, stubborn, and insecure about opening up his mind to more intuitive modes of thinking.

In my opinion, helping students' personal development has been the main focus and achievement of Leslie's studio guidance. All of the students were given a basis for learning that will be useful to them, even among those who will not pursue architectural studies. These results are only in part reflected by the acquisition of basic design skills. Even though this is the intended academic objective, I believe the stories of personal development shared by these students with great enthusiasm, speak best of the accomplishments in this first semester of their architecture studies.

**Interaction for Creation.** One of the strong pillars of Leslie's studio pedagogy is her relational and communication style. Her feminist goals towards students' development and humanistic pedagogical principles inspire the way she relates with her students. Leslie tailored this studio learning environment to foster students' creative processes, being attentive to their uniqueness as individuals.

(Leslie) It's always an interactive process. Students will take from me and perceive what I have to offer from their relative perspective...I always try to tell them: "Each of you is unique in that you start from a different place and your needs are going to differ...So this is not about equality. It's about not about sameness. It's about equity. It's about everyone getting what they need".

Leslie's pedagogy is characterized by this statement of the basic principles of humanistic education from one of her interviews: "If you really pay attention to teaching, it's ultimately a student-centered pursuit, rather than an academic or intellectual pursuit".
All activities that take place in the studio, such as informal talks, pin-ups, desk critiques, and group reviews, have the imprint of her student-centered teaching style. The studio interactions she generates are fluid, stimulating and, on most occasions, fun. Even though studios are defined as having a highly interactive teaching dynamics (Schön, 1985), it is more the exception than the rule that the instructors generate interactions focussed on creation rather than on project critiquing (Boyer & Mitgang, 1996; Diaz, 1997b; Willembrock, 1991).

(Justin) I look over in the other studios sometimes...and I noticed they are working more at their desks alone...[T]he professor walks around once in a while but he doesn't stay there for like ten minutes and talk to [the students] like she does. I notice that...and they don't do pin-ups and the students don't present their work.

Even though Franky is one of the older students who said he found reward in his own work, he still made candid comments about what he felt when Leslie had to leave for an academic conference.

(Franky) I had some fear when she left but I did not want to tell her, that we were not going to be able to make it for that project. We had the other professor. I felt lost again [as in the first days]. [He wondered] What if I have some questions? What if am I going to be able to do it?

His reflections about this experience allowed him to compare teaching styles, point out important differences, in tone and theme, with comments from the rest of the students. Most students relied on Leslie's approval to feel good about themselves and their design. Franky's comment goes beyond that issue, because he feels capable, though in need of good guidance, guidance that can come from "the best professor of the school".

(Franky) I'm not sure, but probably some of the professors are very good architects. But as a professor they are not so good. They [could] be good architect[s], I can understand that. To be a good professor it's different.

Justin's comments showed his interest and keen observation about what happened in other courses and studios. Like Franky, he made comparisons and had opinions about the different types of teaching he observed.

(Justin) He didn't [explain us much]. It is not [that] he doesn't explain it, it's the way [he] explains it. It's like we know it. It's like we had had [that course]. He was talking about something the other day and all of us are looking at each
other and we’re nodding our heads going to sleep because we just don’t know what he’s talking about. It is so different with her [Leslie] because she explains everything.

Both Franky and Justin thought it was important to be a good teacher in addition to having technical knowledge. Justin compared her with another professor and clarified why he valued Leslie’s studio pedagogy.

(Justin) [Leslie] is a teacher and he is an architect. You can be a great architect and not be a good teacher. You can know so much and not be able to work with kids. And she [has] both. I guess that is why he can’t teach for anything. We see it. We all [have] mention it. We [have] talked about that.

It is interesting to note that these students, who had more exposure to architecture culture, were the ones who made these observations.

An important characteristic that was appreciated by students about Leslie’s communication style was that she was honest and direct with them. They said she "speaks her mind". Steve expressed how she tunes in with them and frankly acknowledges her needs as well.

(Steve) There are days that it just seems to go on and on. And she knows it and everyone else knows it. And those are usually the days when she’ll say "You know what? I’m tired and we’re all tired. Why don’t we just cut out a little early" And we’re all like "Yeah." And those, actually those are usually Thursdays because [many of us] have class from 10 to 6 straight through. I don’t have time for lunch or anything. I have lecture and then graphics and then math and then studio. I end the day with a three hour class [studio].

In pin-ups, Leslie reviews each of her students' exercises by first asking them to present their projects to the entire class, encouraging them to explain issues relevant to the project. She helps them to expand their presentation, asking questions about the good points she sees, as well as things they couldn’t solve or execution problems. For special internal reviews, she would match students to take turns in taking notes of the comments so the student presenting would not miss important issues discussed.

(Steve) I just pin up my little drawings and put my little study models around it. You explain what you were trying to achieve with this, how this is different from your final thing. And you explain the whole process and show pictures and all that. Then she’ll critique it herself. She’ll say "This is good, this isn’t. I don’t like this. I don’t like that. I like what you did here. You should have done this here. Maybe you should have done that." Just goes through the whole process. Then she gives you a grade that we don’t [see].
Besides her comments specific to the project, she always manages to make comments on more general or interesting design issues. She expands, if appropriate, on conceptual similarities, achievements or failed choices among projects. In some pin-ups, instead of having each student present their own project, she will ask students to choose a project different from their own and comment on the reasons for their choosing.

(Alexis) Professor Weisman will go and analyze and explain like each person's project. [Then] she'll go through and you learn from each person. You just learn from what she's telling you.

Leslie's goals as a humanist professor are evidenced in her interest in helping students in the construction of their own knowledge, paying close attention to their developmental needs as a person. Several things were noticed in this respect. When critiquing their projects, she had a candid, exploratory attitude, modeling for the student what she expected them to do for themselves and, literally, accompanying the student in the adventure of building up their projects, rather than teaching them how they should do them.

(Leslie) I teach all of them [male and female students] the same way, as though we design from the inside out. We design with our own lens for starters. I always begin with the student as an individual, as a person. So when we design I make sure that I incorporate that person's humanity, that person's sense of identity as a part of the design process. Critical self-reflection is essential to design decision making.

Students very much appreciated this reassuring attitude toward their capabilities in Leslie's teaching. Dhamandeep and Steve commented "you feel the project is yours." As shared by almost everyone in the group, feeling ownership of their designs was a strong influence in the students' enthusiasm for doing studio work.

One of the stronger points Leslie made in her desk critiques of students' projects was encouraging them to take all the options that occurred to them. The newly emerging ideas were encouraged to be taken both seriously in the sense of exploring them as consciously as possible, but also with a "having fun" attitude, assuming there are no errors.

With a clear focus on motivating students to generate their own ideas, Leslie's comments stimulated their own thinking rather than transmitted her architectural biases.
When in students' words "she gives them ideas", these were not to solve the problem, but were to be generators of new ideas from them and indirectly, to expand their view of architecture connecting it with world issues. Students assimilated her respect for what they produced. The issue of ownership of students' projects, so dear to many students as reported in previous pilot studies (Diaz, 1997b), was understood by Steve who valued the fact that she didn't impose her way of doing things. "[S]he could be my way or the highway [do it my way or you fail]. Instead, the project is yours from the beginning, and in the end it is still yours. Everything that you do is yours".

Almost always during the interviews, students made comparisons with other teachers to make their points clearer. In this case, Alexis pointed out what another professor left in charge of the studio for a week did differently. The effect Alexis perceived in her design process at this time was that she was not motivated to aim for a better design. This made her feel critical toward her project, concluding that she had settled for less than what she could have done had Leslie been there.

(Alexis) She was gone for the last part of one of our projects. Another teacher came and tried to help us. He would [encourage] discussing [the project as] a group. We all agreed on the same thing. He would sit down and talk about it with us, [but] he didn't give us any ideas. In fact, we weren't building anything [and] we weren't coming up with any better projects. [The] study model of my project [ended in] the exact same thing as [started]. I never really thought of anything else. The only [differences] turned out to be the model materials and some construction details.

Desk critiques were where Leslie exercised her ideas about sharing power. Leslie's echoed the students' experimental process as a searching partner. Steve found that his probes were going to be "bounced back" by her as in a tennis match.

(Steve) She [Leslie] does everything off of experimentation. I'll go ahead and [develop an idea]. If I like it I'll keep it and maybe I'll head onto it. If I don't, I'll tear it apart and start over and go somewhere else. Or I'll say "Well, if I alter this and this, and I bounce it off of her [Leslie]. And she'll say "Yeah, this is a good idea. I like what you did here. You might be able to expand on here. How would you be able to expand on here?" And then you say "Da da da" and she'll say "Well, go ahead and try it." So the entire time she's just egging you on to keep on doing things.

The message that she gave them of being a co-participant and not a teacher-tell-you-what-to-do was very clear for students. On one side, for self-centered students as
Steve, the fact that she acknowledged and valued his ideas was very important. On the other side, easygoing students had a hard time trying to adjust to the regime of having to think by themselves. She dealt with these cases with humor and firmness, not letting them get away with their slackness or lack of interest for their work.

(One student) was forever saying to me "Give me an idea and I'll do it." It became a joke. I would respond "Once you give me an idea I'll give you something back...a negotiation." I would say "How about you give me something to start with? then I'll give you an idea. You go first, I'll go next."

These two examples illustrate the two extremes in students' attitudes in relation to the desk-critique interactions. Steve, a hard-working though self-centered student, considered Leslie's critiques to be a tennis match. His acknowledgment of Leslie's multidisciplinary knowledge made her a better partner "to bounce ideas back and forth" than his peers. On the other extreme of the spectrum, the least engaged and unwilling student wanted Leslie to tell him what to do. To get something done to get a grade, he did not care about ownership of ideas, so he tried the role of being the obedient, dependent student. This did not work for him in terms of her pedagogy. She tried all sorts of motivational tricks, including suggesting that Jae have peer tutoring sessions with him promoted as "study dates", for them to get support from each other in their studio work.

Acquiring the Design Studio "Know How"

As an architectural scholar, Leslie's objectives for the students in her design studio were determined by the architecture program requirements (See Figure 4.3 Objectives of Leslie the architecture scholar). The last section showed how translating these objectives into the "know how" of design required students to acquire a new mindset and to build psychological strength to face strong insecurities. The students cannot find formulas in books to learn this "know how". The pressure to produce original solutions for their exercises, to a greater or lesser degree, threatened students' self assurance.

At the same time, acquiring this design "know how" meant learning the language as a first step of the socialization process into the architectural culture. As was discussed
in the first sections of this chapter in relation to the Leslie's objectives, the development of design skills depends upon several kinds of interacting processes. Students have to find a method that works for them in solving problems, including generating ideas, evaluating these ideas, and communicating them.

The most compelling, and probably most distressing, of these tasks is trying to come up with new ideas. Success in this challenge causes great excitement and self-assurance. When students are able to come up with ideas, they feel they have achieved the hard part and that the rest of the work will flow. They have to learn that an initial idea can start the creative design process, but that they still have to face the tough part of testing this idea against many problem requirements, through a series of study models and drawings.

Trying to express graphically or volumetrically their ideas, an intrinsic part of the process, will point out to them flaws or inconsistencies they must solve. This means that they will have to come up with new ideas, evaluate them to choose the best option, and continue this iterative cycle until they need to stop to do the drawings and model for the final presentation of the project.

**Initial Baffling Days.** The first weeks for these beginning students were crucial in developing the motivation necessary to do the hard work to pursue this demanding program. Almost all the students felt very intimidated and frustrated. They did not understand what professors were asking them to do, nor did they have any idea of how to do it.

(Alexis) The first project was horrible. I didn't know what they wanted from us. I had never been in a class like this and I didn't know what I was supposed to be doing, how hard I was supposed to be working, what I was supposed to come up with. I was lost. I was really depressed because I thought I was never [going to] be able to do this. I thought that I wasn't cut out for it and like I was not going to make it.

(Sean) At the beginning of the year, probably the first couple of days, I didn't know what was going on yet. I didn't really understand what we were doing. I didn't know what was going on. I was real confused. We had an assignment but I didn't really have any ideas for it. I didn't know what we were looking for.
Usually, students have never encountered in previous educational experiences the type of creative process they are asked to learn in design studios. They are used to dealing with more linear processes finding "a solution" to a problem and not always having to test it. The solution, normally sought in structured steps, is usually a "correct answer". In the case of design, they will learn, augmenting their distress, that there are no "right" answers to be found, only stronger or weaker answers on a relative scale. They do not have either a guiding post or a safe comparative model against which to test their solutions. It is as if everything has to be built in the air without any safety net.

(Matt) When I started I had some trouble. I wasn't able to sit down and think so much about a project, designing something that has to be workable, a workable architecture. You have to get used to the thinking process. It takes a long time to learn.

(Sean) I wasn't really working in class. I was like just sitting there in class doing nothing...now I manage my time better. I'm working in class and I guess it's just because I understand what we're doing now... We never did anything like that in high school. I just wasn't used to [it]. Actually [in high school] we're just like copying something. Now we're coming up with our own ideas.....

As a consequence of the lack of understanding and insecurity, they tended to paralyze themselves, not having the experience to grasp what they are supposed to create. Then, feeling incapable of doing anything, the students felt worse, guilty for not working. A number of students described days at the beginning of the semester as their "worst" days.

(Alana) Worst day is when I had nothing to do. I had no ideas. I just sit there with a blank. I can't design anything. That's the worst. I had that when we started, in the beginning of the course. I felt like everything had to be like perfect or the best.

(Alexis) The worst day was probably the second or third day of studio working on that first project. I remember sitting in class--I guess my brain was not working the way--it was not thinking. I couldn't think of anything. And we had to do it out of paper.

Feeling so bad, and unable to work, it was inevitable for them to watch what was going on with their peers and compare themselves negatively with them. They thought the others were doing better than they were, increasing their feelings of helplessness even more.
(Alana) The stuff I was coming out with in the beginning of the year was horrible. I was like embarrassed. It was tough because being next to my peers, I was seeing what they were doing and I kind of felt discouraged. What should I be doing? It was so frustrating. Why am I coming out with this when all these people are coming out with that? I didn't want to not look good compared to the other students. I always feel that way.

(Alexis) I'm watching at each desk, and they [peers] all were constructing models and coming up with ideas...and had all these things...I was sitting at my desk with a piece of paper, and I could not think of anything. Everything I did made no sense. It was stupid and it looked ridiculous. I couldn't formulate anything that was good. I was so depressed.

Students need time to realize that they are doing explorations and that they are not asked to have "finished products" or "good designs," whatever this means for each one of them. Their unrealistic expectations often get in the way of what they are supposed to be doing. Leslie's role in helping them to overcome their fears and build confidence was directed especially to understanding the process they had to go through and to learn ways to generate ideas.

Leslie's role in the critical phase of the first weeks was crucial for students. Then, and for the rest of the semester, she worked on encouraging their self confidence. Leslie, while introducing them to the design "know how", emphasized their awareness of themselves in relation to the design process. Students need to have an initial self assurance in order to be able to draw from their own resources and produce ideas. Leslie attentively encouraged the production of initial ideas which were strongly validated, thus encouraging further exploration.

The tangible results of their work boosted their self confidence and awareness of their own creative process. These results, in turn, with more stimulation from Leslie, made them want to jump even higher, enjoying the never-ending process of perfecting their results or pursuing more risky options.

Leslie used different methods to help students to achieve both confidence and results. In the next sections, I will give examples of these interactions that made it possible for students to overcome the negative feelings of the first baffling days and successfully participate in the learning design paradox.
From "Where are the Ideas?" to "There are Ideas Everywhere". Before beginning each of the exercises, Leslie gave the students an explanation of the particular approach that she proposed for attacking the project. Also, she assigned what I considered as a warm-up task to break the ice with the exercise. She thought of this task as a starting point upon which students could build. I found, seeing the results, that this was an effective way of building confidence and getting quickly past the blank page syndrome: "...just sitting there in class doing nothing" or "I just sit there with a blank, I can't design anything".

(Justin) ...[To start working with the exercise] she gives us a little assignment... like a main guideline for us so that we were not like... Oh my God! what are we going to do? She gave us something to work with...anything just to show anything. It just gives you an idea of what you can work with.

Justin appreciated the pedagogical value of this "little assignment" that helped students in the group overcome the initial fear that happened each time they began an exercise. For the last exercise, this apparently simple task became a collaborative lesson. As described in the theme on group networking (see section 3.1 of this chapter), this was one way in which Leslie encouraged cooperation among the students.

Most of Leslie's studio guidance was directed, especially during the first phase of the exercises, toward encouraging students in the production of their own ideas. The idea journal, already described as a way to help students mirror their own creative processes, was enforced consistently by her. In this journal they were supposed to draw and make annotations of their thoughts about the exercises. During their corrections or desk critiques, she always asked to see the journal. On many occasions, she went back to a student's idea seen in the journal in a past session as a starting point of some comment she wanted to make. Having awareness of the process gave Alana more control over what she was doing, allowed her to gain self-assurance and, consequently, more pleasure in doing her work.

(Alana) When I'm at home I have like a thinking spot, so I usually go there. Or I [could] sit here and stare at my desk. Then I would just think of some ideas, start drawing in my sketch book. Before, I didn't even think about it. I would just start designing. So now I'm actually thinking and it's more fun now. I like to have all my objects metamorphosing and see them change.
Students like Alana began to acquire a routine to start the design process. The unsystematic, trial and error formula they used initially was charged with anxiety. They did not know where they were heading, and given their seemingly random process, they had no way of exerting control. If they designed something that was acceptable, such as happened with Jae's first exercise, they did not know how to do it again. This further increased their anxiety about producing something good for the next exercise.

Leslie sometimes suggested reviewing the sketchbook journal as a starting point for generating ideas for new projects as an interesting alternative or addition to coming up with completely new ideas. Students were amazed to discover how, under Leslie's guidance, they were able to get new ideas from looking at drawings or models from their old projects. Alexis mentioned that this was particularly helpful to her.

Besides encouraging students to keep track of their process through drawings and writings in the journal, Leslie had other ways of helping students in the production of ideas. She had to be very attentive and creative herself in order to bring up pertinent comments that would stimulate the students' imagination on the basis of the work presented or the ideas brought up by the students themselves.

Her comments during desk critiques always began as a collaborative brainstorming session which responded to each student's initial interests or approach to the problem. She promoted interacting with students by asking them several pertinent questions. If they already had a proposed solution she would push them to look at their projects from different perspectives. Alexis commented about the desk critiques "we discuss and she gives us ideas, and helps us to analyze what we did [be]cause we don't even know sometimes". This kind of fluid ideation process was not only an effective technique for them to produce ideas of their own and to be motivated to explore solutions, but it also encouraged them to develop awareness of their own process and design.

**Studio Play and Hard Work.** Another pedagogical tool she used in her critiques was to make students observe their models from different physical points of view,
moving them around under the light. I heard her say jokingly several times, "When you don't know what to do with a project, turn it upside down and see what happens". Leslie used the theme of shadow and light in every desk crit or group review, encouraging them to play with the model and see what type of shadows it made, moving the lamp or the model around.

(Leisle)...Architecture is transformed by light and shadow, it depends upon it. It changes perception, creates movement, explains the relationship between nature (the sun and moon) and architecture and time as the fourth dimension.

This type of action taught students how they by themselves could see their project from different visual angles, and could see different patterns that change the way the project is seen, experienced and understood. Leslie's example also taught students to develop a probing attitude, one that led them to focus on process as well as "product". She communicated the belief that each project was not solely a matter of right or wrong, good or bad, but rather a way of exploring design thinking and vocabulary.

For the last project, Leslie built upon her technique of using lighting which the students had practiced throughout the semester. Her particular approach to the common freshman final problem (to create a place to view a landscape over a twelve foot rise in which north was given) was to incorporate the sun's movement in the design of a meditation space to be used at different times of the day. This was the first actual architectural enclosure the students had designed.

(Leisle)...Now they are going to use the desk lamp as though it was the sun and it's going to move throughout the day. [The client is meant to be] a contemplative, quiet, meditative individual who visits this special place to meditate three times each day, at sunrise, at noon time, and at sunset. So they have something to animate their imagination.

Leslie's instruction had different effects on students. Eddie, for example, was so enthusiastic about exploring the possibilities that he had for designing this meditation site that he, himself, realized that he should keep it simple, because it was going to be too complex to solve. It seemed that being sure of himself on the "how to," Eddie could entertain himself in generating a wealth of parameters or conditions to be met by his design.
Other students were more worried about the "how to" needed to make the project. Centering their thoughts too early on the end product held up these students' process for generating ideas. This was Leslie's reason for giving the class her additional "narrative" for the project. Contrasting Alexis' process with Eddie's, I observed that she had a hard time moving forward on her project because she had to stop and clarify her thoughts about what she wanted to accomplish. This was not an easy task for her, but she finally managed to do so through a group exercise that Leslie assigned to help generate concepts and with the collaboration of Eddie and others who were in the group. She assigned each student a task they could successfully complete and that served as a basis for elaborating on the exercise for themselves and the entire class.

After giving students the opportunity to feel capable and in control through these easy to accomplish tasks, she pushed them to jump higher, exploring more difficult issues. The objectives of "improving their strengths" and "letting them really have a good time with it" were in fact preparing students to dare more and more in their projects, going beyond the safety of predictable results.

(Leslie) But as or more importantly [than using their strengths and enjoying what they are doing] is finding ways of bringing up [learning opportunities to deal] with the weaker things, the things that they are frightened of, they are avoiding because they are fearing they will not do well so they are playing it safe. Safety is not the way you learn. And so I have to remove those road blocks if I really want them to go anywhere that's unsafe. They have to feel like I won't step on them when they fall over. I do that by rewarding risk over end results.

Here Leslie clearly expresses the connection between her studio objectives of building confidence and acquiring the studio "know how." Her aims with students were not only to help them overcome fears of starting to design the exercise, but to overcome the deeper one of exploring new territory. This can make a qualitative difference in designs as well as a qualitative jump in their creative development as designers and persons.

Dhamandeep, a more mature student than the rest who had previous design experience and better developed graphic expression skills, had clearly made it to the point that Leslie wants all of her students to reach. Dhamandeep shared that "designing is like playing" and that her work came out...
by just playing with it...[with this last exercise] it worked and it looks complete and finished. Now whenever I have something in my mind to design something, I just go for it, like play with it and the design comes [out], like by playing, playing with the shapes and everything, the design comes...

Alana’s personal circumstances contrasted with those of Dhamandeep's. She was the youngest student of the group with no graphic expression experience before coming to the program. Despite these differences, she, as most of the students expressed, felt very positive about her studio experience. As did Dhamandeep, she acknowledged the fun that she was having learning to design. In addition, she gave credit to her classmates and Leslie, while presuming this didn't happen in other studio groups.

(Alana) I feel I'm learning a lot. I'm having fun. I like the comments we've been getting, challenging...[also] my classmates help out a lot. I think we have the best studio. Because the people who are in it and Professor Weisman [who] everybody likes--she's such a great professor. I just think we're lucky.

(Alexis) I would much rather be working in a studio on a project. To me that's more enjoyable than sitting in my room doing like a paper or an assignment or even anything like that. I spend most of my time in the studio building, like almost all of my time, [probably] too much, to the point where I'm not doing well in my other classes.

"Design is like playing" was already present in Dhamandeep's creative process. She shared having had a wonderful drawing professor who not only trained her well but also developed a trustful and encouraging relationship with her in her college experience. Leslie modeled for students this approach to the design process that that will bring forth enormous benefits if they continue to develop it in their next studio's work.

Fun in design studios, as most of the students in this group declared having, is rarely the feeling shared by architecture students, even less so among new students. The discipline needed to go through an architecture program has to be supported by a serious motivation on the part of the student. In the case of this first semester group, Leslie had to start demanding the discipline and hard work they will need if they intend to pursue architecture studies.

Part of what was asked of these newly entered college students were three hour long studio sessions, after-class work until late at night, and the development of new
skills. All of this had to be done while meeting the requirements of other courses. These demands for most of the students were expected without them have yet experienced the thrill of producing their own creations.

(Matt) One of the things I gained were working habits, how to do something on time. It had to get it done, so I had to work all through the night or the day before, all day and all through the night. Really dedicate myself to finishing it. It was good because my peers were along with me working, so it made it a lot easier when they’re helping you too. Everyone is helping each other, so that’s good.

As in other architecture programs, students were required to attend studios for three hours at a time, the longest class they had had until now. Leslie helped in their adaptation to studio routine by being as flexible as possible with breaks, and planning activities to structure their studio time in the most productive way possible. These planned group activities or individual tasks helped students to be focused and motivated. Despite all the help that Leslie gave them, they still had to deal with the issue of being confined in a space for many hours a day, beyond their regular studio hours. In Alana’s words when at the beginning I did not have ideas "It [was] just a long time sitting at that desk like trying to think. Staring at a blank green desk".

Studio’s tough side also included Leslie’s tough side. This honest interchange between Leslie and her students was better evidenced when she had to discipline them or call their attention to their poor performance, showing her demanding teacher side. In the case of negative comments, these were very clearly directed towards their work and always accompanied by sincere, positive thoughts about their capabilities. Students appreciated her frankness. Jae and Matt added how this way of handling a negative evaluation of their work motivated them to perform better.

Jae valued Leslie and looked forward to an architecture degree so she declared as her worst studio day when she told me I was “flunking out”. In a student desk critique done before hers, Leslie told the student that his work was "a production of a little object. It’s not a structure. It’s not architectural". Then Jae said:

(Jae)...so is mine [her project]. I just wanted to get it done for a grade. She told me I got an F on that day. She also said that I can create, that I have the talent but I don’t do anything. I just sit there I don’t use my time wisely. I know it so I just admit it. There’s no way that I’m going to fight with that woman ‘cause I
know I'm not working. I was just scared, very scared 'cause I really want to do architecture and become an architect. That must have been the worst day. I think all day long I didn't eat. I slept.

(Matt) One day she evaluated our projects. Up until that point we had like three or something like that. She said I was doing average work [that] the last couple weren't that good. I think that motivated me. The next project she really liked a lot. I really spent a lot of time on that, with the materials and everything and I was proud of what I did. I knew that she knew that I was proud of it. I thought that was a big step for me. Because what she said motivated me now. I was doing average work. I knew I could do a lot better than that.

When I told Leslie that through the students' interviews I could perceive how students had recognized her objective of valuing the development of their full potential as students more than the task of finishing the exercise, she responded:

(Leslie) Well, because you know why? Because everybody else has been told in the other classes that if you don't have this in, you flunk. I have never used that word. Which doesn't mean that I won't grade someone as a failing grade. But failure is a very relative and pejorative term, and it's not one that I use very often. I only use it as a stick whenever I'm out of other techniques, you know?

She had to use this "stick" with Jae to show her the negative situation Jae had put herself in by not doing her work. Leslie's tough side was always balanced by her caring attitude. She nicknamed Jae "the procrastinator". But Leslie didn't limit her intervention with this rather conventional treatment. In addition, she looked for other ways to help Jae. She encouraged her, without success, to attend a campus workshop on procrastination. After that attempt failed, tuning in to Jae's gregarious personality, she suggested a study-date, which apparently worked to Leslie's satisfaction.

(Leslie) If they feel that they are valued as an individual, they are actually able to tolerate my ability to say to them: that is beneath your dignity, what you've just done there, this is shameful, a disgrace. What's the problem? Are you overburdened? Are you not doing well in your classes? Are you bored? What's stopping you? What's stopping you from doing this? I see that you hate what you are doing. You are frustrated. You don't like it. How can we change it so you like what you are doing?

Leslie has great confidence in this aspect of her creative pedagogy. She was very expressive and sounded very tough, trying to push students' limits. She demonstrated to them her understanding of their personal conditions, separating negative work critiques from what could be taken as personally dismissing comments. When she had to address negative things, she mirrored what the students were communicating.
through their attitudes. That was why Jae said that she could not contradict what Leslie was saying, because it was true. At the same time that she tried to make the student assume responsibility for the situation, she expressed her willingness to help make changes to improve the situation. Students definitely acknowledged her efforts to support them in both sides of studio work: in teaching them to play with the ideas and in demanding from them the hard work needed to bring them forth.

Socialization Tools: Learning the Language and Appreciating Design Beyond the Studio. For students, an important part of the learning process involved beginning to both understand what was required of them and the ability to verbally explain and describe their projects and design processes.

(Matt) In the beginning [the language] was over my head, a lot of the words. Some of them were a lot harder than others, but I think that I got used to some. You have to get used to that kind of architectural language. I'm still trying to get used to it. I mean it takes a long time.

(Alana) The way they would explain the projects, it was the same all the time. It's just the way they worded it, the way they explained the problem. We were like, what does this mean? It's just, it's confusing. I don't know these architectural words.

The mastery of the architectural language included learning skills to express themselves both physically, through drawings and models, and verbally. Most students, such as Alexis who started designing by unintentioned trial and error did not have, less could explain, the reasoning behind their projects "in the beginning if they had asked me to explain where my idea came from or how my project was, I would have no idea".

Acquiring the expressive skills students needed required an increase in their awareness of and sensitivity to detect visual nuances that previously they had not noticed. Sketches and written drafts of concept statements helped them in order to visualize and work on their ideas and to continually document for themselves their design process.

All of the students referred to the difficulty they had in the beginning of the semester understanding the exercises. Students who had less acquaintance with the
language of formal architecture, such as Alana, looked to their peers for help and within a few weeks, their confusion subsided.

(Alana) The teachers would tell us what the project description meant and we’d talk about it with our peers or whatever. Also, you just kind of matched the presentation of the teacher with the words from the [handout] and helped me understand it better. Now, when I start reading the newer ones, I didn’t have much trouble figuring out what I had to do, what I wanted.

Alana also complained about insufficient instructions from the professors for the exercises. As she looked back, she also acknowledged how her process of generating ideas had become more advanced.

(Alana) [professors] were just kind of saying "Use this and do it." [sighs] I think in the first month my project could have been a lot better if I had [understand more what they wanted], like I have so many ideas now for that, it’s ridiculous.

Most students acknowledged how Leslie facilitated this initial acquaintance process, which also accelerated the comprehension of the instructions for the exercises. All of the students commented on their progress in acquiring their communication skills, both verbal and graphic, throughout the semester.

Among the group there were differences according to students’ individual starting points, interests and motivation to study architecture. Their motivation determined the way they felt their about achievements in relation to design and communication skills, in particular. Dhamandeep, as an example of a student who came into the program with some design experience, still had to struggle with verbal skills. The learning of the architectural language was complicated in her case by the fact that English is not her native language. It was especially hard for her to learn how to describe her projects.

(Dhamandeep) The valuable thing that I learned is that now I feel I have more knowledge about design. I can look at my designs and I can describe them more than in the beginning. At the beginning I could create some design and even though I did it...I did not know how to describe [it]. I did not know what to say. Now, I’m not saying that I learned everything about that but I can totally describe my design. I’m better than before. I really [can] say something about my design.

Dhamandeep, as did most of the students, declared how much she had achieved in relation to her communication skills. Adding to this common problem of verbalizing architectural ideas, Eric and Matt and Josh had problems with expressing their ideas in
public and had a hard time coping with pin-up presentations. For Eric, the first pin-up was remembered as his worst day in the studio.

(Eric) Worst day? Probably the first time we had to present our projects...I'm not really too comfortable with presenting myself in [front of] a group of people. I wasn't really happy with my project at all too, so I told everybody flat out, "This is my project. I don't like it." It just became too much.

Other students, on the contrary, found special satisfaction in the development of particular expression skills, such as drawing or making models, as Sean described. "I made models before but keep on doing refined better ways of doing it. Get better at it as you go along, I guess. Just learning different structures..."

For example, Alexis, among the ones who were fully engaged in their work, complained about how model making was time consuming, wanting more time to continue designing.

(Alexis) But like it, it becomes easier and now it's almost like it's not that big of a deal any more. The only thing that it is time consuming [be]cause you're building like for hours and it just takes a lot of time. But it's no longer so hard because now I know what's go[ing to] happen.

In contrast, other students, such as Eric and Josh, who were not as motivated as Alexis, complained about the work it took to come up with a design, missing the thrill of exploring possibilities. Eric, instead of feeling proud of the work done, said it... "[bugs him] [h]aving to make 20,000 study models...it gets annoying when you have like 20 things of the same thing sitting up there with one little thing different on each one."

Being able to understand the language is crucial for students. Not only for facilitating the description of their projects but because it makes them feel they are entering into the architecture culture. Steve portrayed very well how he felt after this first semester in relation to his connection with the architecture culture through learning the language.

(Steve) If I had read [an architecture article] four months ago I don't know that I would have understood a lot. But now that I read it and I've been through and I know some of the language, I do understand it. So, it's not like a foreign language to me. I've gone there, learned stuff, come back. And now I've gone back to that land after being home.
This comment reflects accurately the awareness most of the students shared about their achievements in this studio and the importance of the new language they learned in only four months. I believe that Leslie's conscientious "talking, talking, talking..." to build connections between students' unique worlds and the world of architecture they are entering has been most successful. Not only have students learned the basic tools, but most important they became aware of these valuable acquisitions. This awareness, in turn, increased their confidence and sense of belonging to their learning environment. This was clearly shown in experiences some of the students shared about how their perceptions of the built environment had expanded and in the way they now see works of architecture.

Leslie's intention to give students more than studio "know how's" to solve the problems was communicated to students in small doses, carefully, to not overwhelm students with more information than they could handle. Both in the planning of activities and in the small studio talks or desk critiques, she gave them many and varied examples of different types of architecture and public places. Her objective of constructing a wider contextual framework for what they were doing was clear, and students acknowledged with appreciation the impact of this guidance in their perception of architecture and in the increasing sensitivity with which they now saw their surroundings.

(Dhamandeep) I feel good. I did learn. I didn't waste anything... my money [or] my time... by coming here I did learn something...to me I improved. Now, when I look at something I look with different eyes than before. I see something. Before I just saw shapes, but now I see more than shapes, how they connect with each other, how they make sense, and which goes where and which doesn't go where.

(Steve) When I now go out I tend to look at things, not from a "oh, wow! that's a nice building" point of view, but from "wow, that's a good piece of architecture". I like this and I like that. I like how the columns are this way and not that way.

(Alexis) I can go out now and appreciate the beauty of something. The things that we learned this year were like design aspects that you mesh together, I guess, for the rest of the years. [For example] I'll be out with my architecture friends and we can pick out certain things, which we could never do before. I would have never seen them before.

As part of the desk critique routine, Leslie used shadow and light playfully to help students discover qualities in their models. Using this technique consistently, Leslie
motivated students to observe architecture more attentively, appreciating nuances of light in constructed spaces. One message that students heard frequently about light and shadows was "That's what architecture is about".

Leslie used these types of comments creatively, the same way she did with sharing information from fields other than architecture. She built upon the practical, obvious inquiry they needed to solve the problem other non-conventional questions to stimulate their imaginations.

(Leslie) Where the site is on the slope? We can look at bearing into the site and looking out, and what is the relationship between dark and light? And what about dominating? How do you become a vessel for the sun? How do you create a sun dial?

Leslie believed this observation and thinking would lead them to understand the underlying environmental objectives. The last exercise gave her the opportunity to begin adding these new factors to enrich their solutions. "[Students will] begin to understand the power of the sun as a force for form giving or sustaining energy, for conserving energy."

Alexis shared concrete experiential examples, demonstrating how now she is more observant of architecture spaces and their functionality. She also saw connections between real constructions and concepts she learned through her exercises.

(Alexis) [In a newly constructed section of the cafeteria], on the other side of the wall is where you sit and eat. The only thing that separates you from where you get the food and sit down and eat is like a little wall that comes up like four feet. [In the wall] there's a big like hole, like a strip that goes along the wall [leaving] part of the wall on top. It was just like our enclosure projects. It was implied enclosure. In one meal we sat there, looked around and we noticed it, we discussed it.

(Alexis) [We also noticed] [in Cypress [a residence hall] it takes so long to get to the stairs to take one flight up that no matter what, no matter who's there, you always take the elevator, even if you have one flight. We thought that was a horrible design. I would have never thought of that before.

In addition, some of the students, such as Steve, became motivated to look for sources of architecture knowledge beyond the studio and Leslie.

(Steve) When I go into magazine stores, instead of looking at my usual skating magazines and stuff like that, I'll go over and pick up an Architectural Record or
Architectural Digest. I'll look at those. And I'm getting Architecture Record right now. It's got an article on the Getty Museum that Richard Meyer did.

After describing the details of this building that struck him "with complete awe and amazement" he adds how he now feels in a home land, not a foreigner any more.

(Steve) If I had read it four months ago I don't know that I would have understood a lot. But now that I read it and I've been through and I know some of the language, I do understand it. So it's like every time I go home for the weekend I go back to the home land. Now when I'm here I'm in a foreign land but it's not so foreign anymore.

This expansion of horizons provoked reactions like Steve's subscribing to an architecture publication, Dhamandeep's looking at things with different eyes than before, and Alexis' going out and appreciating the beauty of architecture. Undoubtedly, these were signs of a strong motivation which I believe ran across the group. Depending on their personal conditions, the assimilation of their learnings was different, as was the expression of their processes. These differences will be more evident in the next section, which include students' comments on how they dealt with the process of integrating their personal characteristics and experiences within their construction of knowledge about design.

**Finding Their Own Method.** Leslie was equally attentive to both the students' personal life circumstances and their acquisition of design skills. She was clear about the interdependence of the two and her role in helping them achieve development in both. This integrative process, guided by her, aimed toward students' participation in keeping track of their developmental process as students and individuals.

(Le) When I come to do desk crits and I remind students that I have expectations of them that are related to their own personalities and development, not just related to the handout. Toward the end [of the semester] I will meet with each student and ask them how well they think they did in realizing the personal goals they described to me in our first early meeting. Their answers and self assessment will be factored into how I assess the students' development and achievement.

Leslie's intentions about the importance of including students' own expectations for themselves in the evaluation of their studio performance did not seem to be clear to some students. They expected grades on their work, as they have experienced in their
previous educational experiences, not grades in relation to their personal goals. Leslie joked with them when they asked about grades, saying that she had multiple "grades" for each one of the aspects they had to take into account in each project. Steve and Justin reported feelings of uncertainty with respect to this issue, feelings which were due to their upbringing in terms of their expectations about grades and performance.

Facing the design learning paradox of "having to get an idea in order to know how to get it" brought confusion, uncertainty and anxiety to this first semester students. This central studio issue was addressed by Leslie through coaching them in the production of ideas, being a "playmate" in their explorations, mirroring their thought processes for them, and pushing them to break through safety boundaries to achieve higher standards. I saw in my observations of these students and through my personal experience, that if the professor is able to tune in with the psychological conditions of the student, the initiation into the process of acquiring the design "know how" can be much more successful.

In this studio, students clearly sensed that their developmental process and personal goals were as or more important than the designed result. This emphasis encouraged students to see design in a different light and with a wider perspective. This required, on the part of the professor, more than is usually given in the one-on-one studio interaction. Learning in a studio environment requires students change deeply ingrained learning patterns and the professor provide pedagogy that is sensitive and creative.

Students found different ways to deal with their design exercises. Some of them, faster or more prepared than others, refined a method to attack problems. Having this tool gave these students the sense of security they needed to begin enjoying their design work. Dhamandeep, Eddie, Franky, Justin and Steve, having had previous college experience or proficiency in communication skills, made good use of their knowledge and in some cases were able to develop their own design methodology.
The articulation of design methods that worked for them was a reassuring anchor for these students as well as for others who came with less experience, including Alexis, Alana and Matt. This confidence in their own capacity increased their motivation not only to do their best in studio but also towards gaining architectural knowledge in general. Eric and Sean's previous academic skills allowed them to devote less effort than the others who were less prepared or more motivated to expend effort in their studio work. Eric more than Sean achieved a good introductory design level, but neither of them articulated a work system or felt great enthusiasm for design.

I have chosen to look more closely at the methods of students in each one of the grade levels Leslie assigned at the end of the semester. Not all the students were equally explicit in references to their way of working. I included students from each of the grade levels to give a sense of how their method, or having been able to develop a method, influenced the overall evaluation they obtained in this studio. It is important to remember that in grading Leslie took into account more than just their proficiency with design skills. She also gave great importance to the extent to which students made efforts to develop their potential within the framework of the conditions and goals they had set.

Alexis, Dhamandeep, Franky and Eddie were the A's of the group. Eric, Justin and Steve were assigned B+. Alana, Josh, Matt and Sean received a B. The student who did not participate in the study got a C+ and Jae received a C, the lowest grade of the group.

From the first group, I have chosen to make comments about Eddie. From the second group, I chose Steve and Eric. In the last group, I included Matt and Sean because, though they ended up receiving the same grade, they had very different conditions to start with in the studio. Jae, despite her strong potential, previous arts education, and intuitive aesthetic sensibility, was not as motivated or willing to take her studio work seriously. She also was among the students who failed to attend the second interview and so I ended up having less personal information about her. I assume from what I observed during the studio sessions that she ended up with almost
the same trial and error method she started with, relying on her inherent abilities to make up for lack of work.

An "A" student Eddie was very disciplined and willing to apply all the suggestions Leslie gave to the group. He worked carefully on his sketchbook of ideas to which he added the mathematical calculations he always managed to introduce in his projects.

(Eddie) I would sit there and start my project. Normally where I'd start is in my sketch book. I'd start sketching...I sketch my ideas at the beginning of the assignment, sketch ideas and so on, get my mind thinking as to how certain things should look, what I should be building and doing and how.

He described following a method in his design process that was similar to what he did in previous academic work. He compared getting into a design to writing a paper. His rationally oriented mind felt comfortable having a previously used structure to deal with the uncertainties of creating a design.

(Eddie) I try to develop a thought process. It's almost like writing a paper. You jot down notes. You write headings like your topic, your introduction...the same thought process. [This] starts to get you thinking, what should I add? where is the relation? how should the conclusion relate to the body and the introduction?

The experience Eddie had gained from a year in college before attending NJIT, combined with his serious interest in architecture, enabled him to think more deeply about his projects than anybody else in the group. Choosing a complex solution with his logically oriented thinking pattern and personal determination prevented him from exploring diverse design approaches. This fact did not keep him from trying to excel in all aspects of his projects.

(Eddie) ...[W]hen I do sketches in my book it allows me to start thinking where and what should I be looking for, what type of materials? How is the shape going to look?...often times, like you would in an essay, you revert back to your original assignment. Does it explain what the professor wants you to describe?

Eddie's high level of awareness, sensitivity and wider knowledge allowed him to produce more complex solutions. For his last project, he shared amazingly detailed thoughts about the concern he had for designing to meet the needs of his fictitious "client".
(Eddie) I was trying to address, [the client's] state of mind...even take the shock off the joints as he's walking out the door, feel more rested, more at peace...I was trying to calculate this morning, as I was in the shower, how much he would actually weigh like in scale...because I wanted to...put [the sitting place] in cantilevers...

...[A]nd the issue of weather conditions, the wind, came up to my mind yesterday. I thought that would be interesting like...to blow and maybe the wind down to scale maybe would slowly make movements with the weight...

...[S]o I was actually going to put a scaled weight on the edge where he would be meditating to see if it would actually bob. Very lifelike, like people trying to relax would also sit in a recliner with like a vibrator, you know, something to massage your backs or something is bothering you, sort of soothe you. Not so much like a seat but...like a slight bob every now and then.

Almost immediately after he explained how his string of thoughts stimulated his design process, his rational mind intervened to restrict these ruminations about the project. He clearly knew how to balance his production of ideas with that he was able to handle as a beginning designer. He learned to focus and to simplify his investigations.

(Eddie) It's only first year and I don't want to get too complex and carried away because for me, to bring up points like that would mean I'd be opening up myself to a whole other side of critiquing, in which I might not be able to handle. It's just something I'm thinking of. I could address it but that's not my true intent. This is only first year. Given the time and my restrictions I really couldn't address those issues. But I just thought it would be an interesting concept. Yeah.

(Eddie) I guess the most major experience or lesson I underwent this semester, due to Professor Weisman has been the way I interpret an assignment. It is a certain way to figure out, to simplify the project at the beginning...enough that I could break it up into parts, so I could look at it, in its simplest form and then, see it evolve toward the end, and make sure that along the line it fits the requirements. [Before] I spent too long to make my problems or projects too complex. And being able to break it down, to define a simple way of approaching it I think will help me in the long run......

He knew how to ask appropriate questions of Leslie to help him better develop and to evaluate his projects. This brought him to higher levels of refinement in his projects, because Leslie would then criticize his project according to his potential, not according to what this studio level required from students.

(Eddie) I say to myself does this model, this diagram that I have or this idea define or solve the problem that the professor is asking? Would it exemplify a solution to the problem? I try to find a concession between where my ideas suit their question or problem.

Eddie is the perfect example of the student every professor wants to have in their course for the benefits she/he brings to the rest of students. His responsibility, high
standards of his work and personal qualities made him a valuable member of the group and a help for Leslie, who could have an excellent illustration for points she wanted to make. Nevertheless, I saw that she took great care in choosing examples from other students and not having Eddie's excellence overwhelm his peers who were less skilled, thereby inhibiting them and their productivity. His atypical background for a first semester student, in relation to academic preparation and maturity, not only helped him in his design learning process, but benefited the group due to his open attitude toward assisting them in their studio work.

Steve (B+ student) had greater drawing skills than most of the group and also was an avid reader. He relied heavily on his drawing competency, since it was easy for him to come up with ideas while drawing. His approach was more logical than imaginative. He systematized his brainstorming, most of the time constraining his designs to forms or patterns closely derived from basic architecture constructions he had seen. He described his design process in the following way.

(Steve, B+ student) The biggest thing I learned [in studio] was...that when an idea forms in my head and it comes out, I can take that idea and I can split it up and get about 20 different other ideas from that. Then I can sit back and reflect and say which one is the best idea. Pick that out and then I can run with that idea. I can make many more ideas from that one. It seems like it's a never ending process. It seems like I'm not ever done.

Because of his motivation, enthusiasm, and skills, Steve found the work he had to do to develop his projects pleasurable. He said that after the semester was over, he wanted to continue developing the last exercise during his vacation at home.

(Steve, B+ student) I always draw, I've gone through an entire one of those big pads. I devote like three or four sheets to one project. And it's just like everything is covered--you don't even see the paper anymore. A lot of the time I spend sitting there and drawing out what it's going to look like, making notes, making adjustments. I can pretty much visualize in my head what it's going to come to be. I'll have a study model here and there and I'll build and construct on that.

In the last project Leslie, conscious of Steve's good drawing skills told him to do only models first, to strengthen his model making skills. She allowed him to draw only at the end of the project. He did not mind accepting this limitation but he was very glad to
draw when he could expressing that "[W]ith this project she [Leslie] is making me build everything before I can draw. That's why I'm so happy now that I can draw it".

Leslie pushed Steve (B+ student) to balance the development of his communication skills by strengthening model making in comparison to his more developed drawing abilities. Also, knowing that he was an avid reader, Leslie motivated him to learn more about architecture through publications she commented upon during her critiques or brought into class.

Eric (B+ student) started to develop an awareness of his own design process, but did not feel in control of generating ideas. He recognized that his first idea was usually discarded and he observed how his ideas evolved during the progress of each project. "I like the design process. It's interesting to see how you come from one idea and you come up with the next idea and the final idea. I find that I don't go with [my] first idea".

One confirmation of his insecurity in respect to his capacity to produce ideas was his sharing that the best design method was Leslie giving them something with which to start that assured them the right start.

(Eric, B+ student) When we first get our projects she gives us something to do to help us get into the project, because otherwise we [would] be just sitting there not knowing what to do. We [would] be coming up with something and it [would] be totally wrong.

Thinking that if he starts by himself he could come up with "something wrong" indicated that he still did not fully understand the probing nature of the design process. This and other comments about the way he organized himself to do studio work also indicated his interest in having a product ready on time: "Get my model done. Get my drawing done".

Some of his comments showed how Eric (B+ student) had begun to acquire a sense of proportion and balance. Speaking about his first project he said it was

(Eric, B+ student) All showy and flowery. Yes, that's how my project was. I realized the project should have a center point to look at, a place where the eye can rest. That first project didn't have that. It was just constantly moving around.
But other observations about the same project demonstrated how even though he said he had learned the lesson that "simple is better", he did not know why the project failed.

(ERIC, B+ Student) Also from my experience and from other people's experience, you don't want to take your idea too far, which I did that on my first project...it just became too much. It was the volumetric plane project [with] a sheet of paper. You had to fold it without using any paper or glue. [The] first idea I came up with [was] a little pyramid. It would be squares [that] would stick up...I kept folding it and cutting and slabbing...and slotting, tacking and slotting it. It just became this huge mass of curled paper...it [was] just ...really bad. I tried too hard or something. I learned something from that: simple is better.

Eric confused "working hard on a project" with working without a sense of purpose. The approach he followed was not in taking an idea too far. By piling up paper without having guiding concept, he had created a different problem.

I believe that Eric (B+ student) did not get to the design core which would have allowed him to thoroughly enjoy the creative process. This was the source of his final comments about being more attracted to the model making part of the studio without mentioning the process per se "[I like best] making the models. That's it, I like making models".

Even though Eric's (B+ student) performance met good standards in relation to the group, he was not as motivated to design as other students. For example, Alexis (A student), Franky (A student) or Alana (B student) felt compelled to continue working until the time was up, trying to do the best they could. Their hard work paid off and built their confidence and self assurance. I found interesting to include Alexis' comments to contrast their expressions denoting the different levels of motivation.

(Alexis, A student) I'm a person who likes to work even until the class starts and like I went all night and I don't have any more time. Or until I feel I'm really satisfied with it, [be]cause I won't stop until then...On the days when our final projects are due, I'm usually by that time really satisfied with what I did...All three times, when I presented what I had done, I was really proud of myself. After the first one I wasn't so much because I was really unsure about what I had done.

She believed the clue for success in studio work was to be really motivated.

(Alexis, A student) I think that you just have to work really hard. Anybody can do this as long they have a little bit of...some kind of artistic ability. Pretty much anybody can do it as long as you have to be willing, be motivated and really like what you're doing, and be able to put forward the effort. When I'm at home I either want to be sleeping, eating or I actually want to be back in the studio doing
work, [be]cause there’s really nothing else I want to do. You have to really enjoy it. If you don’t, you’re not [going to] do it. I know people in my class who I don’t think are [going to] be able to do this [be]cause...it doesn’t seem they like what they’re doing. I’m really happy the way things are going for me. In the beginning it was tough. It was confusing. But I think it’s okay now.

Other students, not as advanced as Eddie (A student) or motivated as Alexis (A student), managed to develop methodological tools that helped them in dealing with their design learning process. For example, Matt (B student) spoke of how his understanding of the process allowed him to increase his design skills and productivity.

(Matt, B student) After each project, your ideas come quicker because you have a better understanding. You minimize the problem down quicker. That’s what I felt in each project I had, I minimized what I had to do to save time, and saving time you can do a lot more work.

Sean (B student) described his design process in a different way. His model making abilities drove him to start building study models with his initial ideas as soon as he could. Through model making in this case, Sean was able to clarify what he wanted to design. Because of this faster jump between his ideation/reflection phase and the construction phase, he seemed always to be ahead of his classmates in terms of time or deadlines.

(Sean, B student) I just get a picture in my head. I guess the way I see it at first, when I read [the handouts] or she [Leslie] explains what we’re doing, I come up with a few ideas and pick the one I like the best out of them. I’ll probably start to build them all. But then if I see it’s not working out or I don’t like it then I just drop it.

Sean’s practicality in organizing his time and need to work with a model right away limited his exploration phase. He settled for his initial ideas, not putting more thought or energy into other solutions. He had the sense of having done the homework, but this method proved to be a drawback in his design process. Not pushing forward his limits, he never became fully engaged with his work and thus never had the thrill of creation that captivated students such as Alexis (A student). My speculation is that had he experienced those feelings, his motivation might have increased and so might his dedication.

These students represent different styles of approaching studio work and go from a very clear defined method to the improvement of the initial trial and error approach.
Students who had a better sense of their method had their work rated with a higher grade. As students gained control through a procedure they could apply at will, they felt more secure and motivated.

Hard work did not necessarily mean success. Comparing Dhamandeep’s (A student) internalized intuitive approach with Eric’s (B+ Student) hard work without direction leads one to the conclusion that it is having a direction that counts. Dhamandeep’s intuitive way of doing things was achieved prior to this semester through the development of compositional skills through drawing. She had this strong starting point that placed her on a different level than her peers. Dhamandeep’s work was directed, concentrated and enjoyed. She valued and made the most of her studio time due to her commuting restraints. The effect of her commute and not having a workspace at home meant that she spent less time than her peers completing her assignments.

Motivation, as Alexis (A student) commented, is a strong studio issue. To sustain long hours of exploration, students need to be strongly motivated. The attraction to design only comes from the internal joy of having experienced creation, even in small doses. Discipline and the development of communication skills are as important as students’ motivation in the studio. Students who were not able to maintain a sustained effort could not achieve the joy of creation, a feeling that then fueled internal motivation.

The studio dynamic in sum, as with other education learning environments, required from students a strong internal motivation to succeed. In this studio case, I observed that eight of the thirteen students ended up having a strong sense of accomplishment due to their motivation. The most successful students articulated their method for dealing with the exercises, minimizing their anxiety and enhancing their productivity. If organization and method were not accompanied by the same degree of motivation, students did not feel as much success as did other students, whatever their grades. I believe that students like Eric (B+ student) and Sean (B student) who did fairly well, partly due to their high school education in drafting and fine arts, did so without putting their best efforts forth. The motivation of these students was more external than internal, possibly because each had fathers who were linked in some way to the field.
Despite her lack of drawing skills, Alana (B student) achieved one of the major goals Leslie expected for this semester. She became aware of her design process and did her work conscientiously. At the beginning of the semester, she did things in a more trial and error way, mechanically.

(Alana) I changed the way I saw designing, like how I would think of a project and then just do it. I don't know. I told you before I was like starting to develop my thought process and now I know what I'm doing.

Alexis (A student) spoke of how she has gained method and confidence in her ability to tackle problems. Now, "it's so much easier to think about what to do to come up with an idea". She compared herself at the end of the semester with how she was at the beginning of the semester:

(Alexis, A student) I would be clueless. I would have no idea where to start and what to think of. Now, just from seeing what we did in every [past] project I have somewhere to start. I pick something in my mind to start with and I can develop it. I know the process now. It's just easier to come up with something. I used to be clueless.

In a typical studio environment, it is not common that students develop a sense of their design process (Beinart, 1981). In the next section I will contrast results of the pilot studies I did with students of a higher level. Among these differences was that the emphasis on the design product shifted students attention from their own processes (Diaz, 1997b). I hypothesize with this basis that in a traditional studio it would be unlikely for first semester students to articulate the kind of working tools the students in this studio developed. It is fair to say that the previous experience and maturity of some of the students were important factors to take into account. At the same time, it is useful to look at the cases of Alexis (A student), Alana (B student) and Matt (B student). None of them had previous college experience, and Alana and Matt were the youngest and probably the least prepared in the group. Yet they were able to achieve a relatively high level and develop an understanding of their own design process.

The role played by Leslie was crucial in which I believe successfully integrated the objectives and intentions of the cultural feminist and the architecture scholar. These students' accounts represent the merging of Leslie's concerns "with beautiful form and
the quality of [students'] drawings and models" and the "development of students' fullest potential".

**Studio Dynamics in the Context of Previous Pilot Studies**

My interest in investigating the students' creative processes in studios led me to the initial phase of this research, the pilot studies (see Appendix F). These findings have been used to contrast the comments of the case study students with prevalent studio principles, studio pedagogy, pedagogical strategies and studio practices. In the next figures (see Figures 4.5, 4.6) the dominant principles and studio pedagogy were organized to exemplify schematically the relation between the studio educational principles and studio pedagogy. Alternated with each one of these figures I expanded on the studio dynamic of both options by including Tables 4.2 and 4.3 with the lists of studio pedagogical strategies and studio practices detected in both the pilot studies and this case study. This comparison, besides providing a frame of reference for better understanding the significance of what was accomplished in this first semester studio, I believe helps to clarify as well the direction for changes in studio pedagogy and in architectural education.

In Figure 4.5, Principles and pedagogy of pilot studies studio dynamic, I want to emphasize that studio principles are generally shaped not only on the basis of the master-apprentice pedagogy, but also from traditional education's pedagogical values. In very simple terms this is reduced to the axiom that professors are the knowers and only authorities in the studio and that their values are shaped by what mainstream architectural knowledge and practice requires. In turn, these principles determine the studio pedagogy that each professor applies in his or her respective studio. Despite professorial variations, the typical studio objective is learning design skills. This type of pedagogy, object-centered with the professor as the only source of authority and power, generates a competitive learning environment and the continuing of the cycle of the loner artist myth encouraging students as individualistic designers. This studio dynamic must also be seen in the context of the larger society, which means to include
as part of the latter shaping determinants the socialization messages from the larger society and economic system and the specific ones from the dominant architecture culture. Table 4.2 expands on the studio pedagogical strategies and practices that follow from the principles and pedagogy described in Figure 4.5.

Figure 4.6 and Table 4.3 parallel Figure 4.5 and Table 4.2, describing the studio educational principles, pedagogy and practices of the case study studio. In contrast to the pilot studies, the principles informing the case study studio were student-centered and cultural feminist pedagogies that emphasized a very different power dynamic. In the case study, students were seen as knowers, power was shared between the professor and the students, and a critical vision of architectural knowledge was fostered.

These principles led to a different studio pedagogy, one in which the socialization messages of the dominant architecture culture were combined with those working towards social justice and environmental responsibility. In addition to an emphasis on learning design skills, group empowerment and students' empowerment as individuals was emphasized. Table 4.3 reflects the studio goals, pedagogical strategies, and practices that led from these principles.
Figure 4.5. Principles and pedagogy of pilot studies studio dynamic.
Table 4.2. Dominant studio practices within pilot studies' studio dynamic.

<table>
<thead>
<tr>
<th>STUDIO PRACTICE GOAL</th>
<th>STUDIO PEDAGOGICAL STRATEGY</th>
<th>STUDIO PRACTICE</th>
</tr>
</thead>
</table>
| LEARNING DESIGN SKILLS | - General strategy planned to achieve the best design products according to implied program or professor's architectural values  
- As architectural values are not clearly defined, the professor is the source of the criteria that students must follow  
- The studio strategy is to make a design, without a clear definition of the underlying criteria upon which the solution will be critiqued  
- Transmission of design skills according to each professor's design process and teaching style  
- Emphasis on the product (representation of final project) rather than on students' creative process  
- Students must assimilate the set of architectural values that are absorbed through the process of design and which are largely undefined  
- Students must drop their aesthetical and cultural values to incorporate the values of architectural culture. | - Professor-student interactions vary; students with personal conditions or preparation matching professors' expectations, personality or teaching style have better interactions  
- The non-definition of underlying values produces serious communication problems between professor and students  
- Critiques are directed mainly toward the product and not toward students' processes  
- Student projects are critiqued by pointing out the project's faults, which primarily translates into only negative comments about the product  
- Design exercises are usually minimally or not related to environment or socio-economic conditions  
- All studio activities geared to build students' individual design problem solving skills  
- Students spent most of their studio time working on their own; professors' feedback is generally limited to critiquing the projects by suggesting or demonstrating changes on students' drawings or models  
- Individualistic architecture practitioners as professors with reinforced power (as only sources of knowledge and authority) easily harass and humiliate students as a normal teaching practice  
- Students are left on their own to generate ideas for their designs |
Figure 4.6. Principles and pedagogy of case study studio dynamic.
Table 4.3. Studio practices within the case study studio dynamic.

<table>
<thead>
<tr>
<th>STUDIOS' EMPOWERMENT AS INDIVIDUALS</th>
<th>STUDIOS' EMPOWERMENT AS GROUP</th>
<th>LEARNING DESIGN SKILLS</th>
<th>STUDIO PRACTICE GOALS</th>
<th>STUDIO PEDAGOGICAL STRATEGY</th>
<th>STUDIO PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STUDIO PRACTICE GOALS</strong></td>
<td><strong>STUDIO PEDAGOGICAL STRATEGY</strong></td>
<td><strong>STUDIO PRACTICE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General strategy planned to develop students' full potential as individuals as well as learning design skills</td>
<td>Encouragement of - respecting and valuing peers' input - group networking - cooperative exercises</td>
<td>Internal weekly group review encouraging comments on peers' work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention to students' personal situations and needs, including individual learning styles</td>
<td>Building confidence in students' capabilities</td>
<td>Cooperative exercises</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharing of power in relation to: - knowledge (co-explorer attitude) - resources (group networking)</td>
<td>Creation of a creative learning environment - relaxed and respectful interactions between professor and students - emphasis on process more than on final product - conceptual scaffolding - modelling creative behavior</td>
<td>Peer tutoring (study date)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creation of opportunities for students to express their projects graphically and verbally</td>
<td>Encouragement for design excellence: - breaking personal safety barriers - introducing opportunities for contextual learning to occur.</td>
<td>Pin-ups as group lessons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honoring students' values while introducing them to architectural and feminist values</td>
<td></td>
<td>Internal final group review with guest jurors including higher level minority students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Idea journal to document creative process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Help students develop own method for designing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust feedback/assignments/deadlines to fit individual conditions or learning styles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Techniques for generation of ideas: - using journal as resource for new ideas - mirroring students' work processes - co-exploration of solution with students - warm-up tasks to start each exercise - play with models: changing points of view/ using lamp/light/shadows as a tool to explore forms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of accessible language to introduce students to architecture terms and concepts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Constant use of humor and positive feedback in comments that encourage focus on process</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A Design Studio as a Supportive and Positive Learning Environment

Leslie's studio pedagogy focused on creating both the psychological support students needed for developing their creative process and the training of students in the basic skills of design. The psychological support was directed primarily towards the development of students' self-confidence and the encouragement of group networking to facilitate their individual processes. Leslie's studio pedagogy impacted students' creative processes on different levels and to different degrees depending on each student. The students' accomplishments in this studio experience depended on each student's background, previous training, and personal situation.

While the group of students fulfilled common goals, each student had achievements or reactions in relation to Leslie's studio pedagogy which were more or less unique in the group. First, I will address the common group issues, and then describe the specific aspects of each student. In this group, each of the students had different degrees of awareness and derived different feelings from his or her design process. Few students came to this studio with sufficient confidence and knowledge to alleviate the inherent difficulties of the initiation phase of learning to design. The initial negative feelings of insecurity and fear of failure were replaced, in most cases, by awareness of the process and confidence in their design capacities. In most cases, the greater level of consciousness about their internal conditions allowed a good part of the group to enjoy the process and be self-motivated enough to engage in long hours searching for better solutions to design problems.

I find it amazing that in just a 12-week period these students were able to achieve what I think is the most important part of the creative process. They started to be aware of how creation happens and to have confidence in their ability to solve problems. The negative feelings in the first weeks of the semester were changed into positive ones about themselves and what they could do with their design work.

From the results of the pilot studies and from my experience as an architecture student, I know that learning to solve design problems is a very gratifying process.
Feeling the thrill of putting all their energies into the project and producing something new out of nothing, hooks students into the long hours of hard work required for solving design problems. This thrill allows them to endure many kinds of hardships (such as defective pedagogy, rigid programs, etc) (Diaz, 1997b).

Leslie centers her teaching on motivating students to do their work and helping them build on the skills and experience they bring to the program. She genuinely values what they produce and is able to communicate that clearly: "she speaks her mind". Leslie emphasizes students' design and learning processes, first helping them to become aware of what they are doing by encouraging self-reflection techniques such as keeping a design journal to draw and reflect on their ideas. In helping them acquire self-awareness skills, Leslie also serves as a mirror, reflecting for them in an articulate way the blurred stages and feelings involved in the process. She does this with care and humor.

The more mature and confident students were and the more aware they were of their own process, the less they depended on Leslie's approval. Some students said that both their worst and best experiences in the studio were related to Leslie's actions in connection to them or their projects. Others valued their work and centered their feelings about their process and designs on what they had or not had done, not on the teacher. This same dynamic was also found in the pilot studies, which included students of a varied range of ages. (See Table 4.2, p. 174)

As the students engaged with the flow of creation, the more self-motivated they became (Csikszentmihályi, 1990). The thrill of creation was the central motivation of the students who participated in the pilot studies (Diaz, 1997b). Most of the students in this case study were determined to "do what it takes" to improve or produce better projects. The more motivated students, such as Alexis, Dhamandeep, Eddie and Franky, were not concerned about the long hours of work needed to do that. They always wanted more time to continue working or took their ruminations about their projects with them over their vacations. These students built a good starting base to overcome the great demands inherent in the successful pursuit of an architecture degree.
The creative flow has been accurately described by creativity experts as moments of elation and bliss (Csikszentmihalyi, 1996; May, 1959a). From studies such as these we are able to determine the characteristics and benefits of such states in creatively accomplished individuals. What has yet to be fully explored are the steps to achieve this creative flow: the small, incremental "baby" steps needed to help students dealing with creative endeavors.

Valuable studies which focus on advanced creative achievements and exceptional experiences of creativity (Csikszentmihalyi, 1996; Gardner, 1993) divert attention away from understanding the small "baby-step" achievements part of the creative process. These early creative achievements were precisely the focus of attention and nurture in this first semester studio.

Design studios present a major challenge for beginner students. They often think design skills refer to representation techniques and architectural language. It may take many semesters for them to understand that what is asked of them is not simply making models, but rather to understand the design concept behind the model.

The methodology applied by Leslie helped students avoid being overwhelmed and paralyzed by the difficult first phase of the exercises. Her method seemed to be to create an initial conceptual scaffold upon which they could build the ideas needed to come up with the final solution to the exercise.

The tasks chosen by Leslie to help them get started with each exercise did not focus on the mechanics of the project, but rather allowed them to have an initial grasp of the concept that they were supposed to address in the exercise. Their success in these apparently small tasks affirmed students in their conceptually grounded explorations but, most importantly, kept their morale high for working on the exercise.

To accomplish even small creative tasks, students need to deal with psychological issues along with the acquisition of creative skills. These issues, being of a different nature, require different pedagogical strategies to encourage them. This studio introduced or pushed to another level the development of creative design skills. In just
one semester, I observed changes in some of the students' learning patterns, affirming them in their first steps towards being creative designers.

Baxter-Magolda (1992) speaks of "absolute knowers", students who rely on instructors completely to obtain knowledge and of "independent knowers," those who can create their own ideas. In this studio, students were motivated to become "independent knowers" (Baxter-Magolda, 1992). They discovered, some of them for the first time, an instructor who promoted independent thinking. Design learning is geared toward "contextual knowing," relating it to Baxter-Magolda's categories. By this, I mean knowing in which the learner exchanges and compares perspectives, integrating and applying knowledge. In her model this is the developmental stage after "independent knowing" (See Appendix G Baxter-Magolda's epistemological model).

"Independent knowing", the stage Leslie hoped her students would achieve in this studio, was not the type of academic learning to which students were accustomed. For exercises in the studio, they were given minimal external resources. They had to draw on their own resources, instead of on more traditional information sources. This personal effort included the psychological task of learning to deal with uncertainty. Successful designing, if looked upon from this developmental perspective, cannot be separated from the changes that the individual has to do internally. Thus design cannot be taught by modeling certain design skills or creativity techniques.

To be creative designers, students must overcome fear of their lack of capabilities and strengthen their willingness to take risks. Design is about taking risks. It is about dealing with uncertainties. These are key learnings for beginning architecture students. To a greater or lesser degree, these young individuals acquired these key learnings.
CHAPTER V
CONCLUSION

The underlying purpose of this exploratory study was to contribute to the shaping of design studios as supportive and positive learning environments. Observing Leslie and her group of first semester students expanded the boundaries of the case study in depth and scope, as intended through the research questions: (a) How did the professor's pedagogical principles influence and shape the educational dynamic within this design studio? and (b) How were students' creative processes affected by this professor's pedagogy?

I approached this inquiry with a social constructivist perspective. This perspective corresponds with my beliefs regarding education as a process in which students actively construct their knowledge by integrating formal learning with their social experience. I also believe that as education is a part of the social fabric, it reflects the beliefs and political stances of participants. In this regard, my position is that as educators we must be aware of the implicit messages that accompany our academic work and that architecture education, along with other disciplines, must contribute to social change. These underlying premises determined the two levels of the data analysis: (a) a sociological/philosophical level focusing on participants' ideology, and (b) a pedagogical level in which the professor-students' interactions revealed how this ideology informed the studio dynamic. As part of the case study analysis, I examined the data in comparison with my previous Amherst-Caracas pilot studies (Díaz, 1997b).

The results of this case study indicate a strong convergence of theory and experimental practice. Looking for interdisciplinary connections that could enrich design studio pedagogy, I have related this qualitative research to several studies from other disciplines. Among the ones reviewed in Chapter II, I made representative selections from critical pedagogy, cultural feminism, education and creativity.

Results from the pilot studies and this case study illuminate both ends of the design studio pedagogy spectrum, ranging from traditional studio practices at one end
and design studio alternative (critical/ feminist/ student-centered) practices at the other. The pilot studies, through students' voices and design professors' comments, (Diaz, 1997a) corroborated the description of dominant trends of studio pedagogy provided by various architecture scholars (Boyer & Mitgang, 1996; Porter & Kilbridge, 1981; Schön, 1983), critical pedagogues and feminist scholars (Ahrentzen & Anthony, 1993a; Anthony, 1991; Crrysler, 1995; 1996; Dutton, 1991c; 1996; 1997; Groat, 1993b).

Studying the internal dynamics of this design studio with a social constructivist methodological approach and an interdisciplinary perspective produced (a) an in-depth portrait of an atypical studio learning environment, (b) implications for design studio pedagogy and future research, and (c) directions for change in design studio practices within the architecture education context.

In the following section I will focus on the salient aspects of this studio learning environment. This description will be expanded in the second section with a focused comparison between the findings of the pilot studies and this case study (see also the final section of Chapter IV). By comparing findings from the literature, the case study and the pilot studies, I was able to infer the underlying principles that differentiated the learning environment in Leslie's studio from the usual studio dynamic that was portrayed by students in the pilot studies. The final section of this chapter will relate the findings of this study to the larger context of architecture education and suggest future changes.

**Empowerment and Learning to Design**

The two interacting goals of this studio (empowerment and learning to design) describe this atypical learning environment for first semester students. Leslie's general pedagogical strategy was aimed to develop students' full potential as individuals as well as learning design skills. Her stance as a co-explorer in her studio activities with them built confidence in students. Students' self-assurance combined with the encouragement of group networking helped to create fluid and productive teacher-student interactions. These aspects were part of the pedagogical strategy of Leslie sharing authority and
power in a gradual process, balancing students' empowerment with the firm guidance they needed as first semester students.

The students felt that their personal needs and individual learning styles not only were taken into account but were valued within the group interactions. Their statements about this studio in terms of being a learning environment affirm Leslie's priority of developing their human potential to become socially and ecologically responsible architects, sensitive to beauty and nature. The students also appreciated her communication skills and her openness to knowledge in other fields. Her liberal education inclination motivated them to look for answers beyond the expected parameters of the problem, encouraging them to be "contextual knowers" in their studio problem solving (Baxter-Magolda, 1992) (See Baxter-Magolda's model in Appendix G).

I believe that Leslie's example of creating a stimulating and successful studio experience for her students is not unique. There are other dedicated educators, guided by vocation and experience, who are exploring alternative ways of teaching studio courses. Mostly through their intuition and sensitivity, these educators give priority to the human development of students as part of the educational objectives. Unfortunately, successful experiences of this type in design studios have yet to be documented, despite the importance of studios in the process of educating architecture students (Boyer, 1996; Díaz 1997a).

Leslie belongs to a small group of educators who diverge from the dominant norm in architecture schools. These are educators who think consciously of their teaching in political and cultural terms, aware that their beliefs and personal choices inform their instruction and the dynamics of the learning environment that they create for their students. As a member of this group of educators she also believes in a student-centered education in which students are respected as constructors of knowledge. (Baxter-Magolda, 1992; Díaz, 1997b; Díaz et al., 1991; Groat & Ahrentzen, 1997; 1993b; Willembrock, 1991).
In the investigation process of this case study, I found Leslie to be cooperative and interested in my research, giving me access to do the work I needed. Leslie's awareness of the complexities of this socialization process and her ability to articulate her beliefs facilitated my inquiry into the connections between her beliefs in relation to society and education and her role as an architecture educator and scholar. In addition, she made a thorough review of my descriptions of the studio dynamic and portraits of her and the students, bringing to this work a greater level of accuracy and trustworthiness.

Leslie's studio teaching was aligned both with the principles of student-centered education (Rogers, 1969) and her cultural feminist view (Ahrentzen, 1996) of architecture and society. As a cultural feminist activist and architecture pedagogue interested in students' human development, Leslie has been a fascinating participant to observe. Some of the beliefs underlying the curriculum of the architecture school in which this design studio took place are in conflict with Leslie's educational goals. This lack of congruence has been one of the challenges that she has faced as a design professor, responding to it differently at different points depending on the levels of the studio courses that she has taught.

In this first semester studio, while respecting the primary academic objective of introducing students to design skills, Leslie was able to transmit her cultural feminist values through her attitude, comments and critiques. Thus, she created a supportive and positive studio environment, distinct and atypical among design studios.

Leslie evaluated the students' proficiency in design skills. In addition, in my opinion, the group of studio professors of the same level utilized the freshman group review as a meeting for indirect evaluations of the performance of the students and professors of other groups. Since this was not a comparative or evaluative study, I did not compare Leslie's students' design skills proficiency with what students from other groups had achieved. I believe many design professors will want to see objective proof in those terms of the advantages of Leslie's pedagogy. This I cannot give; I cannot
affirm that Leslie's students acquired more or better design skills than the students from other groups.

Nevertheless, my observations and experience as a professor in an architecture school along with my pilot studies in two settings, the results of which were corroborated by existing literature, allowed me to conclude that Leslie's pedagogy had great benefits in terms of the actual and possible future academic performance of her students. These benefits or effects have much wider and long term implications that cannot be evaluated in objective terms. From students' affirmations and my own limited observations of students' work in other groups, I noted a wider range of design solutions among Leslie's students consistent with their individual development. What was more striking, however, and related to my study focus, were these students' statements indicating their self-awareness of their progress in the creative process and the development of their own methods of addressing design solutions. Being able to have and express this awareness I believe is far different from what normally happens in design studios, even at higher studio levels (Díaz, 1997b; Simmonds, 1981).

Long-term implications of this pedagogical approach need to be examined as well. The acquisition of design skills is only one part of students' development of their creative process. A wider perspective is needed to look beyond the immediate product or solution to a particular exercise. How creativity is judged and which and on whose terms these exercises are evaluated, are issues that could be explored more profoundly in relation to architecture education and studio teaching.

In terms of Leslie's pedagogy, my observations of her studio interactions with students and participants' interviews complement and corroborate the findings of Groat and Ahrentzen (1997). According to these authors, the 40 women faculty of their study articulated through their practices facets of transformation that are paving the way for changes in architecture education and challenging traditional practices.

Leslie's emphasis on creating a basis for collaboration, facilitating communication, and caring attitude with her students are some of the qualities of her pedagogical
approach that exemplify the changes design studio teaching requires. (See Groat and Ahrentzen's comparative table in Appendix G)

Moreover, the case study results were examined, as well, in light of Baxter-Magolda's (1992) research on the intellectual development of college students. Leslie's student-centered pedagogy confirmed Baxter-Magolda's ideas and exemplified that author's suggestions for improving educational practice in higher education in an architecture education setting. Four of Baxter-Magolda's recommendations in this sense are especially pertinent to this case study:

(a) “Validating students as knowers is essential to promoting students' voices” (Baxter-Magolda, 1992, p. 376). In studios, students face learning experiences that could threaten their self-esteem and confidence. In my opinion, changes in studio teaching need to start with an attitudinal modification on the part of professors, as influential figures in the studio system, toward acknowledging and affirming the value of students' ideas. Leslie's stance toward students undoubtedly represented such an approach.

(b) “Situating learning in the students' own experience legitimizes their knowledge as a foundation for constructing new knowledge” (Baxter-Magolda, 1992, p. 378) was another pedagogical recommendation that was validated by Leslie in this architecture setting. I believe authentic expression linked to students' previous experiences is critical if creativity is to be enhanced in design studios. To ignore these personal emotional links is detrimental to students' creative processes or at least hinders possibilities for more creative achievements. Leslie's encouragement of students' awareness and development of their own ways of solving design problems implied searching for connections within themselves of their own particular and diverse experiences.

(c) “Defining learning as jointly constructing meaning empowers students to see themselves as constructing knowledge” (Baxter-Magolda, 1992, p. 380). By assuming that the design learning process is part of students' construction of knowledge, we add
another dimension to what is learned in studios. At the same time, the emphasis on networking and valuing each other's work paradoxically served these students to appreciate the uniqueness of their own projects. In the pilot studies, a small group of professors and students who had the opportunity of doing design projects related to communities shared that they had more productive and gratifying experiences than with projects without any connection with their lives. (Díaz, 1997b).

(d) "The relational component evident in all of these three findings is essential to empowering students to construct knowledge" (Baxter-Magolda, 1992, p. 382). In Baxter-Magolda's diagnosis she stresses the negative effects of our prevalent educational model which separates the personal lives of students from the academic process. I believe that the unique nature of design studios within the general condition of the higher education model will increase Baxter-Magolda's predicted negative consequences. The negative emotional tone employed by students and the reiteration of the disturbing effects of the traditional design studio's regime on students' lives was one of the important findings of my pilot studies (Díaz, 1997b).

Studio demands, compared to other aspects of their study, isolate students even more and, in many cases, greatly disturb their lives. Not only is students' capacity to maintain relationships beyond their close academic circle diminished but also, I think, this impedes the development of their potential to be contextual knowers. In this case study, the emphasis on the building of positive studio relationships was sustained through clear communication and encouragement of students' networking among themselves. I firmly advocate the introduction of teamworking in studios for its implications in students' future within the professional world. To start developing those skills as part of the group empowerment at the first semester level is of great importance. In this case my concern, however, is that if these students return to individualistic-oriented studios all these benefits from an introduction to teamwork will probably disappear in time unless supported elsewhere in their architecture studies.

In addition to contrasting case study results with these two recent studies from feminist and higher education scholars (Groat & Ahrentzen, 1997; Baxter-Magolda,
1992), I was interested in determining to what extent Leslie's approach agreed with advances in creativity research. I found that Leslie's student-centered pedagogy, based on her cultural feminist beliefs, was more connected to the views of creativity researchers with a holistic tendency (Amabile, 1983; Csikszentmihalyi, 1996; Landau, 1987; Montuori & Purser, 1995). Even though she utilized certain creative problem solving techniques, she did not use them as general formulas for making people creative without considering the contextual issues involved.

Reviewing creativity research, I examined how my findings related to research on the enhancement of individuals' creative potential. Along with other creativity experts, Landau (1987) and Csikszentmihaly (1996) acknowledge creativity as an unfolding life process. While Landau thinks about creativity as a "life style", Csikszentmihaly is of the opinion that "[i]t is easier to enhance creativity by changing conditions in the environment than by trying to make people think more creatively" (Csikszentmihaly, 1996, p.1). In addition to the emphasis both Landau and Csikszentmihaly put on context and life perspective in the development of creativity, previous creativity research had strongly supported guidelines offering help to individuals in their creative development. These guidelines are very much coincident with suggestions from educators inspired in student-centered pedagogy. In this studio, Leslie followed her beliefs about student empowerment, thus coincided with Landau and Csikszentmihaly's suggestions for enhancing personal creativity in educational settings. A particular aspect involved students learning from the obstacles they had to surmount and the strategies they used to accomplish creative work in their project productions.

My direct observations, interviews of Leslie and her students, and the review of publications by her and about her studio experiences gave me a wide range of information to report on this first semester design studio. Leslie's multidisciplinary background, varied interests and sensitivity towards students' individual needs facilitated the studio process in which students initiated their creative development as designers and built interpersonal skills for teamwork or future collaborative work. In her studio teaching, Leslie practiced what she explored theoretically in her writings as an
innovative educator, an admirer of architecture, a skilled teacher, an interdisciplinary scholar, a feminist activist, and a concerned environmentalist.

Implications for Design Studio Pedagogy and Future Research

Literature on design studios and the results of my case studies stress two points with which, I believe, both architecture faculty and students would agree: (a) the advantages of the design studio as a learning environment based on hands-on experiences and its higher degree of professor/student interaction as well as interaction among students compared with that in regular classroom settings; and (b) the serious flaws in studio pedagogy that need to be addressed because they jeopardize not only the internal dynamic of the studio but also students' preparation as architecture professionals.

The positive characteristics of design studios that categorize them as good learning environments are the usual 1/15 professor/student ratio and the active nature of the studio learning process. Nevertheless, I find it necessary to stress that these so-called advantages depend primarily on the pedagogical approach followed by the professor and the motivation that the exercise themes foster in students (Diaz, 1997b; Dinham, 1990).

In relation to studios' drawbacks, two positions among scholars and faculty have been detected in the literature: (a) an attitude of resignation based on the beliefs that little or nothing can be done, because studio problems are an intrinsic part of the studio system (Argyris, 1981); and (b) a challenging attitude from a small group of scholars who believe that problematic issues can be changed if flaws in studio practices are understood and addressed within the context of a studio's political and cultural connections (Dutton, 1991c; Ward, 1991; Weisman, 1996b).

My pilot studies revealed a strikingly negative picture of students' studio experiences that gave credence to the positions taken in the critical and feminist literature. In contrast, this case study about Leslie and her first semester students
provided an encouraging picture, suggesting directions for feasible reforms in design studio pedagogy (see Table 5.1). It was reassuring, as well, to note the congruence of the ideas guiding this case study studio dynamic with recent research on creativity and higher education outside the architecture field. This group of students' personal and academic achievements validated the suggestions of these scholars, somewhat overlooked by the architecture education pedagogical system.

Table 5.1. Feminist educational principles (Weisman, 1996b pp.280-282) and traditional architecture education's underlying values (Dutton, 1991b).

<table>
<thead>
<tr>
<th>Leslie's studio pedagogy educational principles</th>
<th>Traditional architecture education's underlying values</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Student-centered model. Share authority and knowledge</td>
<td>a) Master-apprenticeship model. Strong power structure favoring the studio teacher</td>
</tr>
<tr>
<td>b) Collaborative learning and group networking</td>
<td>b) Favor individual creativity/competitive studio environment</td>
</tr>
<tr>
<td>c) Political and cultural awareness about social justice, diversity and environmental responsibility</td>
<td>c) Political and cultural neutrality</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pedagogical consequences of student-centered and feminist educational principles</th>
<th>Curricular and pedagogical consequences of traditional education values</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Connection between non-design courses and studio projects</td>
<td>• Disconnection between non-design courses and studio projects</td>
</tr>
<tr>
<td>• Connection between academic theory and knowledge with applied practice</td>
<td>• Disconnection between academic knowledge and architectural practice.</td>
</tr>
<tr>
<td>• Encouragement of contextual knowing applied to design</td>
<td>• Predominance of decontextualized object-centered design exercises</td>
</tr>
<tr>
<td>• Interdisciplinary connections</td>
<td>• Lack of connection with other fields</td>
</tr>
<tr>
<td>• Emphasis on ethical values based on social justice and environmental responsibility</td>
<td>• Emphasis on aesthetic and techtonic values over user and environmental concerns.</td>
</tr>
</tbody>
</table>

In order to strengthen the implications that I could draw from this case study and the prior pilot studies, I decided to expand on the connections of this investigation with
some of the studies reviewed, from the perspectives of critical pedagogy, higher education and creativity. I contrasted Leslie's cultural feminist principles with characteristics of traditional design studio pedagogy as Dutton (1991) has described. This dominant tendency as described by Dutton is consistent with the findings of the pilot studies (see Chapter 4). Leslie’s integration of her feminist educational principles with her traditionally oriented architecture education workplace was discussed in previous chapters. Table 5.1 highlights the aspects of Leslie’s studio dynamic that challenge traditional studio pedagogy. From these aspects I have derived the subsequent implications for design studio pedagogy.

(a) Design studio pedagogy needs a shift from the master-apprenticeship model to a more student-centered approach in which the learning styles (Gardner, 1983) and personal backgrounds of students would be incorporated as considerations in the design process (Baxter-Magolda, 1992). This shift implies a radical transformation of our beliefs about the educational process including the challenge of established social and political viewpoints.

Argyris and Schöen (1974), using the concept of models of theories-in-use, acknowledged that these design studio problems were structural problems related to student-teacher relations which were also happening in other education settings besides architecture education. They also recognized how their experience in trying to make changes in architecture professors' models of theories-in-use with this behaviorist approach had not been successful (Argyris, 1981). Thus, proposals for structural changes in design studios cannot be addressed within the usual apolitical stance of architecture mainstream supporters. Educational models form part of our political views about society and education and the distribution of societal power (Bourdieu & Passeron, 1977; Freire, 1981; Giroux, 1991; Shor, 1992).

Leslie’s student empowerment goal, in part achieved through their pride in studio work, relates as well to Csikszentmihalyi’s (1996) emphasis on the importance of connection with emotional roots. He refers to this as "Find a way to express what moves you" (Csikszentmihalyi, 1996, p. 364). Leslie's effort in helping students to discover
what they could use from their own resources and develop their highest potential paid off in terms of motivation and uniqueness in the projects.

Leslie helped students cope with personal conditions that could be obstacles for their studio work and was a permanent stimulating source for students' curiosity as well as for the development of their sensitivity to their surroundings. She encouraged the joyful exploration of solutions while at the same time demanded habits of strength, discipline and high standards to ensure that students could take pride in their work.

(b) Collaborative learning and group networking are a very important piece within pedagogical strategies aimed toward student empowerment. The most immediate repercussion of encouraging group networking and collaborative learning is that students reinforce one another as effective producers of knowledge. They appreciate what they can learn from one another, increasing their mutual sense of respect. Studio teachers usually assume that studio proximity and time spent together in studio will naturally generate peer bonding. This has proven generally not to be true (Anthony, 1991; Díaz, 1997b). In fact, the schooling conditioning most students bring to studios tends to make them dependent on the professor and not reliant on peers. The studio's competitive learning environment will aggravate secretiveness and distrust.

To avoid negative reactions among students with deeply ingrained habits of dependence on the professor's authority and to transfer power to students effectively, experiential educators design a special course dynamic. For classroom empowerment to occur in these higher education settings, students and teacher must plan an overt strategy of power transference. In co-planned stages, students willingly acquire classroom power while the professor slowly backs off from directive roles, so a power void is not created in the classroom (Warren, 1988; 1988). In this design studio, Leslie did not plan transference of power as in Warren's model, but being attentive to students' learning processes, and having in mind her student empowerment goal, she gradually gave students opportunities to increase their power as individuals and as a group.
In addition to the benefits of helping to balance the studio power dynamic, the inclusion of group empowerment in studio objectives has significant repercussions for the future performance of practitioners. Traditional studio pedagogy has practically ignored what has increasingly become the usual working mode of architects developing their projects (Cuff, 1991). In her ethnographic account of architecture practice, Cuff asserts that by focusing on the individual learning of design skills, architecture education has lost sight of the practice in real-life situations based on team work and group collaboration. The individualistic, competitive learning environment of studios in traditional school settings shortchanges students in their preparation for authentic practice.

(c) Introducing students to political awareness in areas of social justice, diversity and environmental responsibility has been seen within architecture education settings as political stances which do not have a place in architecture schools. This position is derived from the neutrality in relation to political ideas that has characterized the mainstream architecture profession. This neutrality now has proven to be detrimental for the profession itself in terms of what society expects from architects and from architecture education. Schools are producing architects who continue architecture’s elitist tradition of maintaining a detachment from society’s inequities despite societal changes that require a new vision of architecture practice and education (Boyer & Mitgang, 1996; Fisher, 1994).

One of the evident effects of this underlying apolitical message is the predominance of decontextualized, object-centered exercises in design studios. Students are driven to approach design basically in aesthetic and techtonic terms, having socioeconomic and environmental concerns only as background information most of the time. In this design studio, Leslie had to comply with the requirements for all the first year studio groups, among which were the abstract exercises that students had to develop. The way that Leslie guided the studio activities, especially her one-on-one critiques with students, allowed her to expand and contextualize the abstract exercises of the studio. She complemented students’ arguments with pertinent comments, stimulating them toward new knowledge interesting for their project. In this way she used
students' ideas as valid platforms to construct their own knowledge, thus connecting the development of their ideas to their socio-cultural reality.

Comparing the work that Leslie accomplished in the higher level optional service learning studios with this studio, there was not much that she could do in relation to her political objectives of social justice and environmental responsibility. Since she was obligated to follow the guidelines of the larger first semester group according to the school's objectives, she was limited to introduce a few extra activities in the studio. One example was to spend part of one studio time watching videos about Frank Gehry using the opportunity of the inauguration of the Bilbao Museum in October 1997 to introduce an informal discussion about architecture works in relation to real practice. Another extra activity was to organize an internal group review with guests, who were two practicing architects and two higher-level former students of hers who were excellent minority students. Leslie certainly sent a powerful message to her first semester students by giving the opportunity to their fellow students to be guest jurors.

Contrasting the case study results with Baxter-Magolda's (1992) study on college students, students' differences in their studio learning process became clearer to me. I believe that applying other models, for example detecting students' learning styles or psychological profiles, would be beneficial as well for this purpose. In relation to Baxter-Magolda's model (1992), Leslie's pedagogy clearly encouraged students to be "contextual knowers" (see Appendix G).

According to Baxter-Magolda's (1992) model, I assume that contextual knowing would be the more propitious developmental pattern for students to achieve in order to become creative designers. Leslie did what any good design instructor would do. She encouraged students to be contextual knowers, although they exhibited a whole range of intellectual developmental conditions, learning styles and personalities. Being aware of students' individualities and trying to compensate or build upon their resources was part of Leslie's pedagogical approach. I believe that no single pedagogical approach can guarantee total success with all students.
Directions for Change

A common concern about architecture education reflects pressures from economic and technological changes in society demanding shifts in the professional job market (Cuff, 1991). Academics from different disciplines and perspectives point out the urgent need for changes in the traditional scheme of training architects to satisfy actual and future trends for a teamwork-oriented profession which will be more connected to the needs of people and communities. This general pressure toward change has been increased by the reduction in educational and research budgets and demands for a social justification for what architects do and how future architects are trained (Boyer & Mitgang, 1996; Cuff, 1991; Fisher, 1994).

The issue of connectedness has been a constant that distinguishes both Leslie's pedagogy and recent studies' recommendations from research for the improvement of higher education (Baxter-Magolda, 1992), architecture education and design studio pedagogy (Boyer, 1996; Groat, 1997). This theme, related to the central message of these three groups of researchers, has implications both in content and method for future research and perspectives for architecture education.

According to Baxter Magolda (1992), the use of the educational philosophy inspired by the objectivistic paradigm has "limited educators' ability to connect genuinely with students. By genuine connection, I mean taking students' experiences into account and making meaning with, rather than for, students" (Baxter-Magolda, 1992, p.390). This social constructivist approach to research and education means changing the focus from the professor as solely responsible for the results in design studios (Dinham, 1989; 1990) to the incorporation of students as valid voices to be acknowledged in a joint construction of education guidelines. Within the critical/cultural perspective of this study, I believe that future researchers could look more closely at the direct implications of a student-centered/cultural feminist approach in the development of learning skills. I observed circumstantial evidence, besides the direct evaluation of the professor, that
academic objectives were met. One avenue of research to explore would be the relation between this student-centered approach and the development of design abilities.

In relation to the methodology I believe that my experience with both surveys and in-depth interviews gave me a new perspective in considering content and method in planning a research. Using both a quantitative and a qualitative approach allowed me to compare both perspectives in relation to obtaining information which was useful for addressing the issues I wanted to delve into. My initial interest was to inquire systematically into studio pedagogy to introduce creativity techniques which I thought were ignored and which could be useful for students. These first ideas leading my inquiry were constructed from a professorial point of view and had also an evaluative purpose, I wanted to compare how well students will do if these techniques were used in studios. My position was coming, unwittingly, from the objectivistic paradigm. I knew better than the students what they needed, because I had been a design student myself and that was sufficient!

The parallel experience that contributed to changing my professor-objectivistic perspective was teaching four creativity courses and doing the first pilot study with in-depth interviews. Three semesters of teaching creativity techniques at the architecture school in which I work and at the University of Massachusetts Landscape Architecture program proved to me that isolated efforts in teaching creative techniques did not help students much in feeling and doing better in their design studios. I realized that professors such as myself were heading in the wrong direction. It wasn't enough to think about design studio flaws or architecture education as problems in terms of curricular changes. In my particular case, the lack of a positive learning environment for students in their studios could not be offset by adding one creativity course to their program, a course that was designed independently of those for whom it was intended and of other curricular offerings.

The results of this case study show that Leslie's design studio approach promoted the learning of design skills while developing levels of self-assurance in students, thus allowing them to begin developing their own methods. This awareness of
the learning process and confidence in their skills allowed them to enjoy their experience, an important first step in challenging themselves by taking further risks to be better designers.

As a final summary I could say that the changes in architecture education that I envision after this research call for (a) an increase of teachers' awareness of the educational and political beliefs underlying their studio teaching practices and (b) the encouragement of student-centered design studio approaches in conjunction with group empowerment through teamwork. These studio changes run both inward and outward of architecture education, inviting educators to construct bridges among disciplines and toward the community. Interdisciplinary connections will support today's needs of professional practice and for these connections to be meaningful transformations educators should promote collaborative experiences linked to community issues for new dimensions of education/practice.
August 19, 1997
Lesley Kanes Weisman
New Jersey Institute of Technology; School of Architecture
University Heights; Newark, New Jersey 07102

Dear Professor Weisman,

I'm a Venezuelan architect, currently a doctoral candidate in Education at the University of Massachusetts, Amherst. Thomas Dutton and Sherry Ahrentzen both enthusiastically recommended that I approach you about including your innovative and socially responsible approach to architectural design studios in my dissertation. Your name and teaching philosophy were further extolled in the article by Lee Mitgang "Saving the Soul of Architecture Education" in Architectural Record. After reading your essay in The Sex of Architecture and talking with you on the phone, I am convinced that I couldn't have found a better case study for the final phase of my dissertation work.

Concerns about helping students with their creative process led me from being an architecture student and teacher to an inquirer in education, creativity and psychology. These concerns motivated as well a personal search into my assumptions and beliefs about teaching - more precisely, about premises underlying the dynamic of the traditional design studio for the negative impact it has on students' self-confidence, creative abilities and for the perceptions it fosters about elitism in architectural practice. Time and time again, in my pilot studies for my doctoral thesis, I heard architecture students in both Venezuela and Massachusetts (at the Landscape Architecture and Regional Planning Program) criticize the power structure of design studios. When I read Discrimination by Design, I was thrilled to find another architect who shared my views about the built environment as means for promoting social equality.

I'm sending a draft in progress of my dissertation proposal and my curriculum vitae to better acquaint you with my qualifications. After reading these materials, I hope that, despite your extremely busy schedule, you will agree to participate in my study and allow me to observe and interview both you and your students throughout the semester. I would appreciate, as well, any comments on the proposal draft. Please let me know if you need to modify the tentative schedule we talked about by phone. I'll call you at the end of the month to update the situation with you. Looking forward to initiate what I anticipate as a fruitful interchange in this last phase of my doctoral work.

Sincerely,

Jeannette Diaz
December 20, 1997
Lesley Kanes Weisman
New Jersey Institute of Technology; School of Architecture
University Heights; Newark, New Jersey 07102

Dear Professor Weisman,

I want to express my most sincere thanks for your generous participation and that of your students in the case study for my doctoral dissertation. To observe the group dynamics that you foster in your design studios has been an illuminating experience for me. The students' interviews consistently confirmed that the pedagogy you have developed makes a profound impact in educating future architects in ways that can diversify the boundaries of architecture practice and the clients whom architects serve.

I understand your regret that in this semester you were not teaching Option Studios in which you do service learning experiences with students in the community. Despite the fact that I share with you this interest in collaborative studios, it is readily apparent that you have created a studio approach, even in the first year of study, that deeply plants seeds for personal empowerment, collaborative work and social conscience in your students.

Your openness in allowing me to do this study was greatly appreciated, particularly the complete freedom to attend all classes and to ask both you and the students any questions I chose. Not many people would agree to be monitored so closely. In addition, you gave freely of your time, despite the professional demands you face both inside and outside of the New Jersey Institute of Technology.

My desire now is to honor the privilege you have granted me to do this work and I certainly expect that my dissertation work will generate publications to help disseminate in other countries, besides other architectural settings in the US, the wonderful work you are doing to educate architectural students.

Sincerely,

Jeannette Díaz
Constructing knowledge within a participatory design studio dynamic: architectural students' and their professor's experiences in a collaborative learning environment

Case Study Research conducted by Jeannette Diaz, Doctoral Candidate in the School of Education, University of Massachusetts, Amherst, MA.

Professor Informed Consent Document

The purpose of this research is to better understand studio dynamics by studying one design studio taught with a collaborative pedagogy. Using a contextual and critical perspective, I will study how the professor and students construct meaning as they explore design knowledge, particularly through their interactions in the studio setting.

I would like to request your participation in this study. As a design studio professor, your opinions and perceptions will be greatly valued and appreciated. You will be informed in advance of the project and activities, as well as any changes that may occur for your information and approval. I will be observing the studio sessions in October and November that we have agreed upon. In addition, I am requesting 2 interviews of approximately 60 minutes each, at times and places convenient to you. If possible, the 1st. interview will be scheduled between October 13th and 17th. The second interview will be arranged between December 1st and December 5th, after the design studio's final presentation.

I will maintain confidentiality and protect your anonymity by using a pseudonym to identify you unless you choose to have your real name used in my reports and dissertation. You are free to disclose only the information you feel comfortable sharing, and you have the right to withdraw from the study at any time without any consequences whatsoever. The interviews will be taped, but I will be the only one working with the tapes and the transcripts of the interviews. I will give you copies of your 2 interview tapes if you wish.

The information from this study will be used only for academic purposes: reports, my dissertation, other professional publications and presentations. By signing this consent form, you grant me permission to use the information shared without any further consent or financial compensation. Your signature indicates that you have read the above conditions with the researcher and freely offer your consent.

[Signature]
Participant signature
Date: Oct 13, 1997

[Signature]
Researcher signature
Date: ________

201
Constructing knowledge within a participatory design studio dynamic: architectural students' and their professor's experiences in a collaborative learning environment

Case Study Research conducted by Jeannette Diaz, Doctoral Candidate in the School of Education, University of Massachusetts, Amherst, MA.

Student Informed Consent Document

The aim of this research is to learn about this freshman design studio. I'm interested in studying the interactions between you and the professor and among all students. Most important I want to hear your thoughts and feelings about this design studio. Sharing aspects of your background and previous life experiences will form an important part of this research.

I would like to request your participation in this study. As a design studio participant, your opinions and perceptions will be greatly valued and appreciated. I will be observing some studio sessions, including the final review and final presentation. In addition, I will request two interviews of approximately sixty minutes each, at times and places convenient to you. The first interview will be scheduled between October 13th and 17th. The second interview will be arranged between December 1st and December 5th, after the design studio's final presentation.

I will maintain confidentiality and protect your anonymity by using a pseudonym to identify you unless you choose to have your real name used in my reports and dissertation. You are free to disclose only the information you feel comfortable sharing, and you have the right to withdraw from the study at any time without any consequences whatsoever. Participation in this study is not connected in any way to your course grade. The interviews will be taped, but I will be the only one working with the tapes and the transcripts of the interviews. I will give you copies of your 2 interview tapes if you wish.

The information from this study will be used only for academic purposes: reports, my dissertation, other professional publications and presentations. By signing this consent form, you grant me permission to use the information shared without any further consent or financial compensation. Your signature indicates that you have read the above conditions with the researcher and freely offer your consent.

Participant signature
Date: ________________

Researcher signature
Date: ________________
Participant:

Name: ___________________________ Age: ______ Sex: ______
Birth place: ________________________ Race: ______
Previous college experience: ________________________________________________
Previous architecture related experiences: ______________________________________
Present Address: ___________________________________________________________
Phone: ___________________________ E-mail: _________________________________

Preference about anonymity:
I may be identified by my first name: ______
I prefer not to be identified: ______ Pseudonym: _______________________

Researcher Information:
Jeannette Diaz
58 South East St.
Amherst, MA. 01002
Phone/ Fax: (413) 253-3926
E-mail: jeannette. diaz @ educ. umass. ed

Dissertation advisor information:
Prof. Patt Dodds
School of Education. Furcolo Hall
University of Massachusetts.
Amherst, MA 01003-3010
Phone (413) 545-0529
E-mail: pdodds @ educ. umass. edu

Feel free to contact either me or my advisor if you have any questions.
POTENTIAL TOPICS TO GUIDE OBSERVATION AND INTERVIEWS

1. Context and history

1.1. Characteristics of the architecture program and/or university, in particular policies regarding curricular changes.

1.2. What are the circumstances that allowed this collaborative approach to be implemented within the existing architectural curriculum at the school?

1.3. Professor's expertise in her architectural education practice.

1.4. Students' background, e.g. cultural heritage, ethnicity, social class.

2. Motivations and expectations

2.2. Professor's beliefs about architecture education.

2.3. Professor's beliefs about the architecture profession as it relates to architectural education.

2.4. Professor's beliefs about design studios, in particular freshman design studios.

2.5. Professor's pedagogical motives for initiating/promoting collaborative learning in studios.

2.6. Professor's motives/attitudes toward social change and relation to studio pedagogy.

2.7. Students' expectations of the architecture profession and architectural education.

2.8. Students' expectations of the architectural program in relation to design studios.

2.9. Students' expectations of their design professor, as a professor, as a woman professor, and as a design studio professor in the architectural field.

3. Initial perceptions and later impressions

3.1. How do students perceive this design studio as a learning experience?
3.2. How do students perceive their professor's interactions with them in relation to their learning experience in design?

3.3. How do students feel about the demands of the architectural program and of the design studio assignments?

3.4. Given her previous teaching experience, how does the professor perceive this group of freshman students in relation to their motivation/skills/maturity?

3.5. How does the professor feel about the demands on her skills and capacities by this particular group?

3.6. How does the professor perceive the group dynamic as a result of introducing collaborative practices within the studio sessions?
SAMPLE PROFESSOR'S INTERVIEW QUESTIONS

• Which design levels have you taught?
• Do you find differences/similarities in your teaching among these different groups?
• How can you describe your goals in teaching this freshman design studio?
  - What would you say characterizes your teaching freshman students?
  - What makes it different, how similar to other design studios in this program?
• What have been your aims in relation to students' creative process?
• What kind of interpersonal dynamic do you want to develop among studio members?
• What kind of dynamic do you think is being achieved in this studio?
• Have these freshman students encountered any particular difficulties related to the
  organization or dynamic of the studio?
  - Are these difficulties similar/different to students of other semesters?
• What have been the benefits and drawbacks for the students you have perceived in
  conducting this type of studio instead of the traditional master-apprenticeship model?
• How do you think students' gender influences the interpersonal dynamic of this
  particular design studio?
• How do you perceive students' creative processes to be affected by this collaborative
  pedagogical design studio?
• Do you have students in this studio with academic training abroad?
• Which are the impressions of students with design training in other
  programs/countries, if any?
• What do you think about design studios in relation to the program?
  in other schools of architecture?
• What sorts of architects do you envision graduating from your program?
• What has led you into your particular way of teaching?
• What have been your aims in relation to your own creative development as a teacher?
SAMPLE STUDENT INTERVIEW QUESTIONS

• What are your feelings about being in an architecture program?
  - What do you like or dislike about it?

• How do you imagine yourself as an architect?
  - What would your life be like?

• Walk me through a day in which you have had a design studio.
  - Where do you go since getting up in the morning?
  - What do you do?

• Describe a typical studio session.
  - Are the sessions all the same?
  - Which do you like best?

• Tell me more about desk critiques/reviews/ other aspects of the studio.

• What are the guidelines for this design studio?
  - What do you think of the guidelines?
  - Would you make them different? How?
  - What do you like about the guidelines?

• How do you meet your studio requirements?
  - and the requirements for the other courses?

• Have you had previous experience working in teams?

• What are your feelings so far about this design studio?
  - What pleases you the most?
  - What bugs you about the studio?

• What do you think of the professor?
  - What do you think the studio would be like if it were taught by a male professor?

• Tell me what has been your best day in this design studio.

• Tell me about your worst day in this design studio.
The Faculty of the School of Architecture and the University Curriculum Review Committee have approved the requirements listed below for the five-year Bachelor of Architecture degree.

The practice of architecture is a design and decision-making process aimed at solving problems in the built environment. It is the thoughtful making of spaces which serve people.

The architecture program at NJIT considers a wide variety of environmental problems - certainly more than just buildings. A solution could begin with choosing a site, or opening undeveloped land to its best and most appropriate uses, or in keeping that land in its natural state. The scope of a problem might be that of a piece of furniture, a room, an entire neighborhood, a central business district, or an entire community or city. The designer's solution could be a long-range plan or guidelines for future growth. The key may be in preserving or adaptively using existing elements of the built environment which are currently misused or discarded.

The total time needed to earn a Bachelor of Architecture degree (the first professional degree) at NJIT is five years.

**Credit Distribution for the Bachelor of Architecture Degree**

<table>
<thead>
<tr>
<th>Credit Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Architecture Credit</td>
<td>99</td>
</tr>
<tr>
<td>Architecture Electives</td>
<td>12</td>
</tr>
<tr>
<td>Free Electives</td>
<td>3</td>
</tr>
<tr>
<td>Rutgers Drawing Course</td>
<td>3</td>
</tr>
<tr>
<td>General University Requirements**</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>164***</td>
</tr>
</tbody>
</table>

(Effective Fall, 1996)
**General University Requirements (GUR):**

**English Composition (3 credits):**
- HSS 101 Writing, Speaking, Thinking

**Mathematics (8 credits):**
- Math 113 Finite & Calculus I
- Math 114 Finite & Calculus II

**Physics (8 credits):**
- Phys 102, 102A Physics Lecture & Lab
- Phys 103, 103A General Physics Lecture & Lab

**Computer Science (2 credits):**
- CIS 104 Computer Programming and Graphics Problems

**Cultural History (6 credits):** Choose two of the following courses in any order: HSS 211 The Pre-Modern World, HSS 212 The World and the West or HSS 213 The Twentieth-Century World

**Social Science Lower Division (6 credits):**
- SS 201 Economics and one of the following: HSS 202 a approved introductory course offered by Rutgers-Newark in anthropology, economics, political science, psychology, and sociology.

**Lit/Hist/Phil (6 credits):** Two courses chosen from upper division electives in Literature, History, or Philosophy, but it is recommended that both not be from the same field. Qualified students may take Honors Seminars in the Humanities (Hum 491H-499H) to fulfill all or part of this requirement.

**Hum/SS/STS Upper Division (3 credits):** One upper division elective with one of the following designations: anthropology, arts, economics, English, history, humanities, literature, philosophy, political science, psychology, sociology and STS (science, technology and society).

**Management (3 credits):**
- MGMT 390 Principles of Management or IE 492 Engineering Management. Students who have been accepted for the dual degree program (B.Arch and M.S. in Management) take HRM 601 Organizational Behavior.

**Physical Education: (2 credits):** Any two PE courses.

**The minimum credit requirement for graduation is the successful completion of 164 credits of prescribed courses within the curriculum; and the maintenance of a 2.0 (C) average. Students must also earn a GPA of 2.0 in upper division course requirements of their major.**

In addition students are required to maintain a minimum 2.0 studio cumulative average to advance to each succeeding year of studio.
GUIDE FOR ARCHITECTURE PROGRAM

FIRST YEAR
1st Semester
Arch 103 - People & Their Environ 3-0-3  
Arch 155 - Arch Graphics 2-3-3  
Arch 163 - Intro to Design I 1-9-4  
HSS 101 - Writ, Spkg, Thinking 3-0-3  
Math 113 - Calculus & Finite Math* 4-0-4  
Frsh Sem - Freshman Seminar 1-0-0  
17  
2nd Semester
RUO80121 - Intro to Drawing 0-6-3  
Arch 164 - Intro to Design II 1-9-4  
Arch 172 - Arch Programming 3-0-3  
HSS XXX - Cultural History * 3-0-3  
Math 114 - Calculus & Finite Math 4-0-4  
CIS 104 - Computer Program & Graph Problem 2-1-2

2nd Semester

*Placement in math courses is determined by testing of all incoming freshman architecture students.

SECOND YEAR
Arch 241 - Arch Construction I 3-0-3  
Arch 251 - History of Arch I 3-0-3  
Arch 263 - Arch Studio I 1-12-5  
HSS XXX - Cultural History * 3-0-3  
Phys 102 - General Physics 3-0-3  
Phys 102A - General Physics Lab 0-2-1  
18

THIRD YEAR
Arch 331 - Landscape Arch 3-0-3  
Arch 363 - Arch Studio III 1-12-5  
Arch 381 - History of Arch III 3-0-3  
Arch 383 - Structures II 3-0-3  
Arch 386 - Building Performance 3-0-3  
17

FOURTH YEAR
Arch 463 - Arch Studio V 1-12-5  
Elective - Architecture 3-0-3  
Elective - (Lit/Hist/Phil: GUR) 3-0-3  
Elective - (Social Science: GUR) 3-0-3  
PE XXX - Physical Education 0-1-1  
15

FIFTH YEAR
Arch 563 - Arch Studio VII 1-12-5  
Elective - Architecture 3-0-3  
Elective - (Hum/SS/STS: GUR) 3-0-3  
Elective - Senior Thesis 0-15-5  
14

*Choose two of the following courses: HSS 211, 212, or 213 to fulfill Cultural History Requirement

Total number of credit hours required 164
COURSE DESCRIPTIONS

ARCH 103 Introduction to People and Their Environment (3-0-3) Required
This introduction to design presents an overview of the relationship between people and their
environment, both natural and man-made. The emphasis is on seeing and comprehending what is around
us, identifying and discussing the forces of change at work in the environment, and clarifying the role
of the environmental designer. Supplemening the faculty lecturers will be guest lecturers and field trips to
significant environments and professional design offices.

ARCH 155 Architectural Graphics (2-3-3) Required
Techniques of graphic presentation are introduced as a basic language of architecture. Students work
with a broad range of graphic presentation methods. Skills are developed in drawing and architectural
delineation. Fundamentals of perspective drawing, rendering techniques and format layout are examined
through an array of projects.

ARCH 163 Introduction to Design I (1-9-4) Required
Students are introduced to an array of basic principles and elements of design. Emphasis is on design
methods, sensitivity to context, manipulation of form and space, and representation skills. General design
fundamentals are presented in the lecture hour.

ARCH 164 Introduction to Design II (1-9-4) Required
Prerequisite: Arch 163. Students continue to develop the basic design principles and skills introduced in
Arch 163.

ARCH 172 Architectural Programming (3-0-3) Required
Prerequisite: Arch 163. This course establishes the relationship between human activities and
architectural intention through learning methods for systematically outlining goals and performance
criteria, and means for achieving them. Programming is approached as management of information in
terms of gathering, analyzing and presenting data useful for informing design. Students develop a
schematic design program for a final project.

ARCH 241 Architectural Construction I (3-0-3) Required
Prerequisite: Arch 155. Students are introduced to the construction process and its role in architecture.
Materials and methods of wood, heavy timber and masonry construction are presented. Emphasis is on
process, compatibility of materials and drawings as a communication tool in construction.

ARCH 242 Architectural Construction II (3-0-3) Required
Prerequisite: Arch 241. This course is a continuation of Arch 241 and relates construction to
architectural design. The study of materials and methods of construction concentrates on steel precast
and poured-in-place concrete. Emphasis is on criteria for selection of materials and systems, materials
research, standards and test methods, and forces of deterioration.

ARCH 251 History of Architecture I (3-0-3) Required
Prerequisite: Hum 112. This course is a survey of the social, political, technological, functional, and
aesthetic concerns of Western architecture from its earliest beginnings.

ARCH 252 History of Architecture II (3-0-3) Required
Prerequisite: Arch 251. This course is a continuation of Arch 251, bringing the survey of the continuing
evolution of Western architectural works and ideas up to 1800.
ARCH 263 Architecture Studio I (1-12-5) Required
Prerequisite: Arch 164. Utilizing the knowledge and skills gained in Introduction to Design I and II, students learn about architectural design. Students begin to examine the technological, social and environmental issues as they relate to architectural design. Lecture hour is used to explore in-depth aspects of architecture.

ARCH 264 Architecture Studio II (1-12-5) Required
Prerequisite: Arch 263. This studio course continues to build upon the content of Arch 263. Lecture hour is used to explore in-depth aspects of architectural design.

ARCH 282 Structures I (3-0-3) Required
Prerequisite: Physics 102. Students are introduced to structural statics through timber and steel design. Influences of materials and structural system choice are analyzed relative to their impact on building design. Responsibilities of the architect during the structural design phase are introduced.

ARCH 283 Special Topics (3 credits) Elective
Group investigation of problems of special interest in Architecture.

ARCH 310 Co-op Work Experience I (3 credits) Elective
Prerequisites: Completion of the sophomore year, approval of the school and permission of Division of Cooperative Education and Internships. Provides for co-op internship major-related work experience. A designated faculty member and evaluates the students' work and project. Requirements include mandatory participation in seminars and completion of a report and/or project.

ARCH 312 Environmental Education I (2-3-3) Elective
Prerequisite: Arch 264. This course involves architecture students working with grade school or high school students in the solution of a joint environmental design project. Participants will first work towards developing their own understanding and sensitivity of the man-made environment. Emphasis will be on learner-directed and discovery-guided inquiry, and educational methods to increase awareness of the physical settings created for human activities. Projects will be developed in nearby schools which focus on the interaction of individuals and small groups with the environment.

ARCH 316 Computer Applications to Architecture (2-3-3) Elective
Prerequisite: CIS 104. This course introduces both philosophical and technical approaches to the use of the computer in architectural design and analysis. It explores the use of existing computer programs for spatial allocation, energy analysis, life cycle costing, problem analysis, and computer simulation. Projects will include development of computer programs applicable to architecture.

ARCH 317 Advanced Architectural Graphics (2-3-3) Elective
Prerequisite: Arch 264. This course will give students advanced techniques for architectural expression, including Chinese ink wash and air brush techniques. It will emphasize how drawings may be used to reveal the inner qualities of design. A basic knowledge of drawing methods, media, materials, and projection techniques will be assumed.

ARCH 318 New York City Lab (1-6-3) Elective
Prerequisite: Arch 172. This course explores the architectural and environmental development of New York City the past 200 years in an organized series of field trips. Each week's trip will encompass a section and/or representative aspect of the City's evolution.
ARCH 321 Radical Architecture (3-0-3) Elective  
Prerequisite: Arch 252, Arch 172, Arch 363. This course offers a broad based exploration of art and architecture as a form of individual, social, or cultural expression, stressing the relationship between ideas and craft.

ARCH 328 Urban Values (2-3-3) Elective  
Prerequisite: Arch 172, Arch 363. This course is a survey of urban planning practice and historical, contemporary, and theoretical urban design approaches. It considers the physical environment as a response to human values, and explores how nature, the city, and the user influences the form and content. Case studies will include cities, towns, and specialized recreation and retirement communities. Laboratory work will include field trips, demonstration exercises, and analysis of case studies.

ARCH 331 Landscape Architecture (3-0-3) Required  
The course is an overview of the opportunities and constraints of landscape designs. The emphasis is on developing a practical understanding of the potentials of earth, water and plants in architecture. Students are given an overview of social and ecological determinants of relations between land and buildings.

ARCH 342 Architectural Construction III (3-0-3) Required  
Prerequisite: Arch 242. The objective of this course is to develop the architects' understanding of the relationship between building material selection, building codes, testing, construction procedure and life safety.

ARCH 363 Architectural Studio III (1-12-5) Required  
Prerequisite: Arch 264. This studio course continues to build upon the design concepts introduced in Arch 264. The lecture hour explores in depth the nature of technology, environment, and social order as they relate to studio work.

ARCH 364 Architecture Studio IV (1-12-5) Required  
Prerequisite: Arch 363, Arch 172. This studio course continues to build upon the design concepts introduced in Arch 264. The lecture hour explores in depth the nature of technology, environment, and social order as they relate to studio work.

ARCH 381 Architectural History III (3-0-3) Required  
Prerequisite: Arch 252. This course will cover architecture as a manifestation of the technological era 1800-1950. Issues of aesthetics and society in architecture will be analyzed as part of the development of modern industry and modern culture.

ARCH 382 History of Architecture IV (3-0-3) Required  
Prerequisite: Arch 381. This course will cover architectural theory and practice from the 1960 to the present. Among the issues to be discussed are reactions and responses to Modernism, reevaluations of history, reconsideration of urban contexts, balancing/universalism and regionalism, utopias and anti-utopias. While the focus will be on European and American architecture, developments in other parts of the world will also be introduced.

ARCH 383 Structures II (3-0-3) Required  
Prerequisite: Arch 282. Methods and details of timber and steel design are summarized. Course emphasizes details, methods and practices of concrete design, mixing, pouring and testing. Structural design is taught in the context of architectural design and cost constraints.
ARCH 384 Structures III (3-0-3) Required
Prerequisite: Arch 383. Continuing with the content of Structures I and II, students develop a systematic overview of important differences between wood, steel and concrete structural systems. Students learn methods and procedures for selecting between alternative structural systems. Advanced topics such as complex structural behavior, prestressed concrete and new structural technologies are introduced.

ARCH 386 Building Performance (3-0-3) Required
Prerequisites: Physics 102 and 103. Students develop an understanding of the physical concepts of heat, air movement, and thermal mass for use in architectural design. Approaches to dynamic analysis and energy conservation are examined.

ARCH 387 Environmental Control Systems (3-0-3) Required
Prerequisite: Arch 386. This course provides a framework for making informed selections of building systems and equipment. Students are provided the necessary background to analyze the advantages and disadvantages of alternative system designs for mechanical, electrical, plumbing and transportation systems in buildings. An introduction to working with consulting engineers and conducting life-cycle costing of building systems is provided.

ARCH 403 The American Home and Household I (3-0-3) Elective
This course is a cultural, architectural and psychological analysis of various American homes and households throughout history. Included are: The Puritan Society and Colonial home, the Victorian home and family, the frontier homestead, 19th century utopian communes, immigrants, the working class poor and urban tenements, war housing, and suburban homes. Students will explore the meaning, use and design of each domestic setting from the point of view of society, the family and the individual, considering differences based on race, sex and class.

ARCH 404 The American Home and Household II (3-0-3) Elective
This course analyzes the architecture of the 20th century American homes and households — hotels, apartment houses, war housing, suburban homes, public projects; collectives, communes, self-help housing, and housing concepts for the future. Psychological, sociological, and cultural perspectives will also be considered insofar as they affect the architecture of the home.

ARCH 408 Advanced Landscape Architecture (2-3-2) Elective
Prerequisite: Arch 331. This course introduces students to the design, construction and management of significant contemporary landscape projects through case studies, field trips, and personal contact with prominent practicing landscape architects. An historical perspective of landscape architecture since World War II will be used as a context for discussion.

ARCH 410 Co-op Experience II (3 credits) Elective
Prerequisites: Co-op Experience I or approval of the school and permission of the Division of Cooperative Education and Internships. Provides for a co-op internship major-related work experience. A designated faculty member monitors and evaluates the student's work and project. Requirements include mandatory participation in seminars and completion of a report and/or project.

ARCH 419 Architectural Photography (2-3-3) Elective
Prerequisite: Arch 364. This course is designed to give the student a wide range of photographic solutions for presentations and portfolios. Lecturers will consist of orientation and general topics including light and space, using relevant text selections, and slide presentations for reinforcement. There will be basic demonstrations of darkroom techniques and unorthodox methods to encourage experimentation.
ARCH 422 Mythical House (3-0-3) Elective  
Prerequisites: Arch 252, 172, 363. This course will show that the house develops not only in response to reasoning, laws of physics, and biological needs, but also in response to magic, ritual, culture, personality, fantasy and dreams.

ARCH 463 Architectural Studio V (1-12-5) Required  
Prerequisite: Arch 463. This studio course continues to build upon the design concepts introduced in Arch 364. The lecture hour explores in depth the nature of technology, environment, and social order as they relate to studio work.

ARCH 464 Architectural Studio VI (1-12-5) Required  
Prerequisite: Arch 463. This course continues to build upon the design concepts introduced in Arch 463. The lecture hour explores in-depth the nature of technology, environment, and social order as they relate to studio work.

ARCH 483/483H Special Topics (3 credits) Elective  
Group investigation of problem of special interest in architecture.

ARCH 491 Independent Study (1 credit) Elective

ARCH 492 Independent Study (2 credits) Elective

ARCH 493 Independent Study (3 credits) Elective

Arch 530 Methodologies of Architectural History, Theory and Criticism (3-0-3) Elective  
Prerequisite: Arch 251, Arch 252. A seminar examining the salient methodologies of architectural history, theory and criticism. The seminar is structured around a series of critical texts, with each set of core readings intended to provide a basis for analyzing and assessing the approach in question.

ARCH 531 A History of Renaissance Architecture (3-0-3) Elective  
Prerequisite: Arch 251, Arch 252. An examination of the development of Renaissance architecture and urban design in Italy and elsewhere in Europe. The re-emergence of the classical tradition is considered within the context of social, political and economic developments as well as formal intentions, including its transformations in Mannerist, Baroque and Rococo phases.

ARCH 531B History of Baroque Architecture (3-0-3) Elective  
Prerequisite: Arch 251, 252. An investigation of architectural development from the 17th and 18th centuries in Europe and Latin America, including consideration of stylistic variations, social and political factors, and trends in garden and urban design.

ARCH 531C History of Modern Architecture (3-0-3) Elective  
Prerequisite: Arch 251, Arch 252. A study of major tendencies of architectural theory and practice from the mid-19th to the mid-20th centuries. Formal and stylistic transformation considered in relation to theoretical intentions as well as social, cultural, and technical developments.

ARCH 531D History of American Architecture (3-0-3) Elective  
Prerequisite: Arch 251, Arch 252. An investigation of the guiding ideals and dominant stylistic trends in American architecture an planning from colonial times to the mid-20th century. Critical shifts in conception and scope of architectural production considered in relation to the prevailing cultural, socio-economic, and technical contexts out of which they evolved.
ARCH 531E History of Non-Western Architecture (3-0-3) Elective
Prerequisite: Arch 251, Arch 252. An examination of major architectural traditions of China, Japan, Southeastern Asia, India, and the Middle East. Each area considered with reference to a conceptual, iconographic, and stylistic paradigm that evolved from a particular historical context.

ARCH 531F Thresholds of Architectural Theory (3-0-3) Elective
Prerequisite: Arch 251, Arch 252. A seminar that investigates key thresholds of Western architectural theory, from Vitruvius to Venturi, with emphasis on examining the corresponding critical theoretical texts and related didactic building and projects.

ARCH 531H Aspects of Urban Form (3-0-3) Elective
Prerequisite: Arch 251, Arch 252. An examination of the major forms and patterns of urban development from classical antiquity to the 20th century, considered in relation to the changing conceptions of the city as well as cultural, socio-economic, and political development. Recommended selective for students electing Community and Urban Design Area of Concentration.

ARCH 532 Problems and Methods in Architectural Preservation (3-0-3) Elective
Prerequisite: Arch 251, Arch 252. Theory and practice of preservation planning, with emphasis on current concepts, problems and techniques of area preservation in the United States. Successive guiding ideals and approaches to historic preservation in the U.S. together with European parallels and antecedents. Theories of continuity and change in the urban environment and concepts and techniques that further preservation-planning objectives in programs for community development and neighborhood conservation.

ARCH 533 Case Studies in Architectural Creativity (3-0-3) Elective
Prerequisite: Arch 364. Considers creativity in architecture from psychological, philosophical, and autobiographical perspectives. The building, writing, and lives of contemporary architects discussed in the context of general theories of creativity. Each student chooses an individual architect noted for creative accomplishments and prepares a case study of their career.

ARCH 534 History of Architectural Technology (3-0-3) Elective
Prerequisites: Arch 251, Arch 252, Arch 381, Arch 382. Survey of the development of building methods and materials. Impact of structural and environmental technology on architectural form and the design process. The role of technology in contemporary architectural theory and practice including the modern movement is emphasized.

ARCH 540 Acoustics (3-0-3) Elective
Prerequisite: Building Performance and Environmental Control Systems. Architectural acoustics: how we hear, physics of sound and materials, aesthetics of design and the processes of construction. Audible sounds, their interaction, perception of echo and directional hearing are applied to interior and exterior building transmission, room acoustics, and setting acceptable acoustical environments.

ARCH 541 Experiments in Structural Form (2-2-3) Elective
Prerequisite: Arch 384 or equivalent. Study of architectural form through model design, construction and testing of minimum structures. Inquiry into the relationship between elements of soap film study, orthogonal and diagonal grids, design of tension grids through deflection loading, photoelastic models and calculation. Studies the relationships between structural form, geometric systems, patterning and proportion, symmetry, asymmetry, relative size, nesting, linearity and spiral orders, rectilinear patterns, randomness resulting in architectural structure and form.
ARCH 542 Regulatory Codes and Standards for Architectural Construction (3-0-3) Elective
Prerequisite: ARCH 544. This course explores the variety of standards and regulations which affect
the evolution of a building from preliminary design through occupancy. Topics include building
codes, life-safety and comfort, structural performance, environmental protection, construction
products and systems standards, materials testing, zoning, land use, and esthetic restrictions, etc. Regulations are analyzed for
their impact upon various building types such as residential development, or specialized uses such as
hospital and research laboratories.

ARCH 543 Lighting (2-2-3) Elective
Prerequisite: Arch 386 and Arch 387 or equivalent. Explores through modeling and calculation, the
means by which architectural form and detail influence the luminous environment. Perceptual
responsibilities, such as visual comfort and delight are examined. Topics include daylighting footprints,
model design and testing, and computer-assisted light-level analysis. Areas of investigation include:
relationship between daylight and electric light in architecture, the variations of light with time, analysis of
seasonal and weather differences, role of task in lighting strategies, and means of control for light
quantity and quality.

ARCH 544 Building Structure, Construction and Climatology (3-0-3) Elective
Prerequisite: Arch 386 and Arch 387 or equivalent. Discussion of the development of building materials,
constructions systems, structural systems and approaches to climate responsive design in architecture.
Examines the evolution of environmental control systems, building structure and architectural form. The
course presents several approaches to different climate conditions, including traditional, vernacular and
modern.

ARCH 545 Case Studies in Architectural Technology (3-0-3) Elective
Prerequisite: Senior standing or equivalent. Technological systems involved in the construction and use
of buildings are studied. Students will conduct in-depth investigation of technology-related problems in
architecture and construction. The case-study method will be used. Construction documents and reports
are to be analyzed. Field visits are required.

ARCH 546 Designing and Optimizing the Building Enclosure (3-0-3) Elective
Prerequisite: Arch 386, CIS 104. This considers the "building envelope", the boundary dividing the inside
of a structure from the outside environment. Students study and design optimal enclosures considering
energy exchange, the relationship between energy and lighting, and life cycle costs.

ARCH 547 Special Topics in Computer Applications (3-0-3) Elective
Prerequisite: Senior standing. Evaluation, utilization, and development of computer programs for
analysis, simulation and information management. Programs range from energy analysis, building
structures analysis, and mechanical systems design to spatial allocation, graphics and computer-aided
design. Different theories of information transformation and delivery used in terms of architectural
applications. Course hardware ranges from computer-aided design and drafting systems, through micro-
and minicomputers.

ARCH 548 Interdisciplinary Energy Conscious Design (2-2-3) Elective
Prerequisite: Senior standing. Architecture and engineering design strategies affecting energy savings in
buildings are studied. Heating, cooling, ventilating and lighting alternatives are evaluated in the context
of energy conservation and their influence on building design and mechanical systems. Project teams of
architecture and engineering students examine specific design situations, such as fenestration, daylighting,
natural ventilation and relationships between various systems. Emphasis placed on interrelationships
between analysis and design.
ARCH 549 Life Safety Issues in Contemporary Buildings (3-0-3) Elective
Prerequisite: Arch 387. A variety of life safety and comfort situations are studied in different building types. Course topics include building evacuation, compartmentalization, fire fighting and suppression, evaluation and testing of new building materials and systems, systems control and management. Special attention is placed on multi-use, high-density buildings.

ARCH 550 Building Economics (3-0-3) Elective
Economic issues and methods of analysis influencing the building process and product are presented. The focus is on relations between architectural decisions and economic consequences. Students will use computer models to manage building cost data and conduct life cycle costing.

Arch 552 Real Estate Analysis Development for Architects (3-0-3)
Prerequisite: Completion of the third year. Introduction to the economic, financial and political aspects of real estate and their effect on architectural decision-making. Topics include: needs assessment, real estate appraisal, financial investments, regulations and real estate, design as value-adding, and the effect of tax policies on real estate development.

Arch 556 Systems Approach to Design and Construction (3-0-3)
Prerequisite: Completion of third year. This course emphasizes an understanding of the processes by which we orchestrate the use of resources to provide for human aspirations and need through design. Land, Finance, Management, Technology and Labor are considered; coursework involves lecturers, case studies and student projects.

ARCH 557 Problems in Modern Housing (3-0-3) Elective
Prerequisite: Arch 252. A historical approach is used to place housing in its social, economic and political context. Attempts to provide decent affordable and well designed housing for board segment of society are examined. Dwelling is examined through analysis of prototypical design solutions in urban environments.

ARCH 558 Professional Architectural Practice (3-0-3) Required
Prerequisite: Arch 364. This course is a forum for examination of the structure and practices of the profession of architecture. The formal and informal relationships between architects, and between architects and clients, government officials and consultants are studied. Basic principles of office management for the small and large architectural firm are introduced.

ARCH 563 Architectural Studio VII (1-12-15) Required
Prerequisite: Arch 464. This course continues to build upon the concepts introduced in Arch 464. The lecture hour explores in depth the nature of technology, environment, and social order as they relate to studio work.

ARCH 564 Architectural Studio VIII (1-12-15) Required
Prerequisite: Arch 563. This studio course continues to build upon the design concepts introduced in Arch 563.

ARCH 566 Senior Thesis (0-15-5) Elective
Prerequisite: Arch 563. This is an independent study option which may be chosen by the student with the approval of the school, and in place of Arch 564.
Arch 572 Architecture and Social Change (3-0-3) Elective
Prerequisite: senior standing. Architectural form is analyzed in relation to political, economic and technology change, and change in social values. Buildings and other designed environments such as parks, streets and neighborhoods studied relative to social processes and institutions that generate and transform them. The role of the design professions in initiating or supporting change also considered.

Arch 573 Technologies Community and Urban Design (3-0-3) Elective
Prerequisite: Senior standing. Advanced and traditional technologies are analyzed with regard to their role in community and urban design, construction and reconstruction. Emphasis will be on technological systems that influence location, configuration and use. Examples are: infrastructures, communication systems and construction technologies. Skills will be developed in using methods to evaluate alternative technologies relative to their social, economic and physical promise, problems and feasibility.

ARCH 574 Case Studies in Community & Urban Design (3-0-3)
Prerequisite: Senior standing. An in-depth investigation of real-world problems of urban and community design carried out using the case study method. Current practices in the U.S. and other countries studied using interviews with designers, developers, community groups and government agencies. Site visits, reports and other documents provide important sources of information. Final report with supporting documentation required.

Arch 575 The Practice of Community and Urban Design (3-0-3)
Prerequisite: Senior standing. Knowledge, skills and techniques for effective professional community architecture and planning proposals, including participatory design, identification of funding sources, grant writing requirements, intervention theory, role of on-site charettes and techniques for communication with neighborhood groups, government agencies and other institutions.

ARCH 576 The Architecture of Utopia (3-0-3) Elective
Prerequisite: Senior standing. Seminar for the review of utopian projects that have attempted to embody and strengthen social ideas through transformations in the structuring of space. Architectural implication of different literary and philosophical utopias will be analyzed with an emphasis on those experimental proposals which were realized in whole or in part in built form.

ARCH 583/583H Special Topics (3 credits) Elective
Group investigation of problem of special interest in architecture.

ARCH 584 Video and Animation (3-0-3) Elective
Prerequisite: Arch 363. This course presents the concepts of 3DE surface modeling, rendering, key frame animation and video production in the context of the design process using the computer program ALIAS STUDIO. The course emphasizes the underlying geometric principles of surface modeling, the components of color theory and texture mapping, the principles of key frame animation, and video production. The project for the semester is a short animated video. Scene Description Language programming is also discussed.

ARCH 585 Imaginary Worlds: Architecture in Motion Pictures (3-0-3) Elective
Prerequisites: Arch 363, Arch 381. Like childhood photographs in family albums, movies are part of our collective memories and become a unique way of "remembering" an era or place—even one that has never existed or could exist. The study of imaginary worlds in motion pictures provides students with opportunities to gain an awareness of architecture and study it from different perspectives. Movies studied will be limited to those that postulate new or unique environments rather than those films that faithfully document reality. Discussions will focus on architectural issues raised by the movies studied as well as those found in critical essays.
ARCH 591  Independent Study (1 credit)  Elective
ARCH 592  Independent Study (2 credits)  Elective
ARCH 593  Independent Study (3 credits)  Elective
1. Profile of the faculty of NJIT by gender and ethnicity.

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>AI/AN</th>
<th>A/PI</th>
<th>H</th>
<th>W</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Full-Time</td>
<td>5</td>
<td>0</td>
<td>52</td>
<td>3</td>
<td>228</td>
<td>288</td>
</tr>
<tr>
<td>Adjuncts Male</td>
<td>4</td>
<td>0</td>
<td>10</td>
<td>4</td>
<td>129</td>
<td>147</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>0</td>
<td>67</td>
<td>8</td>
<td>435</td>
<td>522</td>
</tr>
<tr>
<td>Faculty Full-Time</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td>Adjuncts Female</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>44</td>
<td>47</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>0</td>
<td>24</td>
<td>3</td>
<td>163</td>
<td>193</td>
</tr>
</tbody>
</table>

98 percent of NJIT full-time faculty hold the terminal degree for their field.

Percentage of NJIT course sections taught by full-time and by adjunct faculty.

The percentage of undergraduate course sections taught by adjuncts for Fall 1991, Fall 1992, and Fall 1993 is as follows: 16 percent, 16 percent, and 26 percent.

Major research and public service activities at NJIT.

In recent decades, NJIT has pursued a course of institutional transformation from an engineering college to a public research university. That task is essentially complete. The growth in research over the last two decades has been dramatic:

- Number of research projects: 30 in 1972 to 461 in FY94.
- Number of faculty engaged in these projects: 40 in 1972 to 151 in FY93.
### Undergraduate Architecture Students

<table>
<thead>
<tr>
<th>Total Number</th>
<th>486</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>370</td>
<td>76%</td>
</tr>
<tr>
<td>Female</td>
<td>116</td>
<td>24%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>327</td>
<td>67%</td>
</tr>
<tr>
<td>African-American</td>
<td>25</td>
<td>5%</td>
</tr>
<tr>
<td>Asian</td>
<td>51</td>
<td>10%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>83</td>
<td>17%</td>
</tr>
</tbody>
</table>

### Graduate Architecture Students

<table>
<thead>
<tr>
<th>Total Number</th>
<th>83</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>56</td>
<td>67%</td>
</tr>
<tr>
<td>Female</td>
<td>27</td>
<td>33%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>67</td>
<td>81%</td>
</tr>
<tr>
<td>African-American</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>13</td>
<td>16%</td>
</tr>
</tbody>
</table>
# Enrollment: headcount and percent by ethnicity as of fall 94

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>AI/AN</th>
<th>A/PI</th>
<th>H</th>
<th>W</th>
<th>U</th>
<th>NRA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Undergraduate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time Male (N)</td>
<td>310</td>
<td>5</td>
<td>542</td>
<td>357</td>
<td>1251</td>
<td>193</td>
<td>151</td>
<td>2809</td>
</tr>
<tr>
<td>Full-Time Male (%)</td>
<td>11.0%</td>
<td>0.2%</td>
<td>19.3%</td>
<td>12.7%</td>
<td>44.5%</td>
<td>6.9%</td>
<td>5.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Full-Time Female (N)</td>
<td>122</td>
<td>0</td>
<td>140</td>
<td>108</td>
<td>151</td>
<td>44</td>
<td>55</td>
<td>600</td>
</tr>
<tr>
<td>Full-Time Female (%)</td>
<td>20.3%</td>
<td>0.0%</td>
<td>23.3%</td>
<td>18.0%</td>
<td>25.2%</td>
<td>7.3%</td>
<td>5.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Part-Time Male (N)</td>
<td>147</td>
<td>0</td>
<td>172</td>
<td>152</td>
<td>719</td>
<td>117</td>
<td>31</td>
<td>1338</td>
</tr>
<tr>
<td>Part-Time Male (%)</td>
<td>11.0%</td>
<td>0.0%</td>
<td>12.9%</td>
<td>11.4%</td>
<td>53.7%</td>
<td>8.7%</td>
<td>2.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Part-Time Female (N)</td>
<td>52</td>
<td>0</td>
<td>35</td>
<td>23</td>
<td>72</td>
<td>40</td>
<td>4</td>
<td>226</td>
</tr>
<tr>
<td>Part-Time Female (%)</td>
<td>23.0%</td>
<td>0.0%</td>
<td>15.5%</td>
<td>10.2%</td>
<td>31.9%</td>
<td>17.7%</td>
<td>1.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Total (N)</strong></td>
<td>631</td>
<td>5</td>
<td>889</td>
<td>640</td>
<td>2193</td>
<td>394</td>
<td>221</td>
<td>4973</td>
</tr>
<tr>
<td><strong>Total (%)</strong></td>
<td>12.7%</td>
<td>0.1%</td>
<td>17.9%</td>
<td>12.9%</td>
<td>44.1%</td>
<td>7.9%</td>
<td>4.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Graduate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time Male (N)</td>
<td>8</td>
<td>1</td>
<td>32</td>
<td>21</td>
<td>80</td>
<td>56</td>
<td>356</td>
<td>454</td>
</tr>
<tr>
<td>Full-Time Male (%)</td>
<td>1.8%</td>
<td>0.2%</td>
<td>7.0%</td>
<td>4.6%</td>
<td>17.6%</td>
<td>12.3%</td>
<td>56.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Full-Time Female (N)</td>
<td>6</td>
<td>0</td>
<td>24</td>
<td>11</td>
<td>17</td>
<td>25</td>
<td>86</td>
<td>169</td>
</tr>
<tr>
<td>Full-Time Female (%)</td>
<td>3.6%</td>
<td>0.0%</td>
<td>14.2%</td>
<td>6.5%</td>
<td>10.1%</td>
<td>14.8%</td>
<td>50.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Part-Time Male (N)</td>
<td>57</td>
<td>0</td>
<td>182</td>
<td>70</td>
<td>530</td>
<td>394</td>
<td>177</td>
<td>1410</td>
</tr>
<tr>
<td>Part-Time Male (%)</td>
<td>4.0%</td>
<td>0.0%</td>
<td>12.9%</td>
<td>5.0%</td>
<td>37.6%</td>
<td>27.9%</td>
<td>12.6%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Part-Time Female (N)</td>
<td>37</td>
<td>0</td>
<td>63</td>
<td>26</td>
<td>120</td>
<td>213</td>
<td>39</td>
<td>498</td>
</tr>
<tr>
<td>Part-Time Female (%)</td>
<td>7.4%</td>
<td>0.0%</td>
<td>12.7%</td>
<td>5.2%</td>
<td>24.1%</td>
<td>42.8%</td>
<td>7.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Total (N)</strong></td>
<td>108</td>
<td>1</td>
<td>301</td>
<td>128</td>
<td>747</td>
<td>688</td>
<td>558</td>
<td>2531</td>
</tr>
<tr>
<td><strong>Total (%)</strong></td>
<td>4.3%</td>
<td>0.0%</td>
<td>11.9%</td>
<td>5.1%</td>
<td>29.5%</td>
<td>27.2%</td>
<td>22.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

NRA : Non-Resident Alien  
B : Black/African American, Non-Hispanic  
AI/AN: American Indian/Alaskan Native  
A/PI : Asian/Pacific Islander  
H : Hispanic  
W: White, Non-Hispanic  
U : Unknown  

**Enrollment Statistics**  
New Jersey Institute of Technology
Atelier de Le Corbusier,
Rue Nungesser et Coli, Bougogne-sur-Seine
photograph by Rene Burri, 1956 (Magnum)
Welcome to First Year Design Studio.

For the vast majority of you, this will be a totally new experience for you, the concept of education in a studio atmosphere. As with any creative endeavor, Architecture is dependent upon the studio, or atelier, for the teaching of the discipline of design.

As students of Architecture, the Design Studio is the single most important class that you will have. It is here, 3 hours a day, 3 times a week, that you will develop your design instincts and creative thinking. You will synthesize a variety of information, not just from your other coursework, but also from other life experiences as well. And it is within the format of the design studio that this will occur.

The Studio will consist of groups of approximately 17 students and one instructor working individually, yet learning together. Each of your instructors is an accomplished Architect and Designer in their own right. You will be working in studio, not only during scheduled studio hours, but also during off studio hours. You will learn from each other as well as from your instructor. Some of your studio companions will become your closest lifetime friends. You will be working diligently, but you will have enormous rewards in the satisfactions of accomplishment.

This semester we will complete a series of explorations into certain basic principles of design. The exercises will be usually of a two week duration, in which you will open onto new understanding and insight. You will gain skills and strive to create. Most importantly, you will learn the process of design, the trial and error method of challenging convention, testing assumption, developing meaningful ideas, all under the watchful guidance of your instructor.

Finally, this Studio experience will be a rewarding one for those who will accept the challenges and seek the creative potential within. It will prepare you to become not just Architects, but exceptional Architects.

-Craig Konyk, First Year Design Studio Coordinator 1996-97.
# NJIT
School of Architecture

## MASTER SCHEDULE

<table>
<thead>
<tr>
<th>week</th>
<th>SCHEDULE</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>mo 01 sep</td>
<td>ARCH 155 First Class Session</td>
</tr>
<tr>
<td></td>
<td>tu 02 sep</td>
<td>ARCH 163 First Class Session</td>
</tr>
<tr>
<td></td>
<td>we 03 sep</td>
<td>ARCH 163 Assigned: &quot;Volumetric Plane&quot;</td>
</tr>
<tr>
<td></td>
<td>th 04 sep</td>
<td>ARCH 103 First Class Session</td>
</tr>
<tr>
<td>2</td>
<td>mo 08 sep</td>
<td>ARCH 163 DUE DATE: Preliminary Exercise &quot;Volumetric Plane&quot;</td>
</tr>
<tr>
<td></td>
<td>tu 09 sep</td>
<td>ARCH 163 Assigned: Exercise #1: &quot;Endosure&quot;</td>
</tr>
<tr>
<td></td>
<td>we 10 sep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 11 sep</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>mo 15 sep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 16 sep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 17 sep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 18 sep</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>mo 22 sep</td>
<td>ARCH 163 DUE DATE: Exercise #1 &quot;Endosure&quot;</td>
</tr>
<tr>
<td></td>
<td>tu 23 sep</td>
<td>ARCH 163 Assigned: Exercise #2 &quot;Structure&quot;</td>
</tr>
<tr>
<td></td>
<td>we 24 sep</td>
<td>ARCH 103 DUE DATE: Assignment #1.</td>
</tr>
<tr>
<td></td>
<td>th 25 sep</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>mo 29 sep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 30 sep</td>
<td>No Due Date: Rosh Hashana Observance</td>
</tr>
<tr>
<td></td>
<td>we 01 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 02 oct</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>mo 06 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 07 oct</td>
<td>ARCH 163 DUE DATE: Exercise #2 &quot;Structure&quot;</td>
</tr>
<tr>
<td></td>
<td>we 08 oct</td>
<td>ARCH 163 Assigned: Exercise #3 &quot;Surface&quot;</td>
</tr>
<tr>
<td></td>
<td>th 09 oct</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>mo 13 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 14 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 15 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 16 oct</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>mo 20 oct</td>
<td>ARCH 103 DUE DATE: Assignment #2</td>
</tr>
<tr>
<td></td>
<td>tu 21 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 22 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 23 oct</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>mo 27 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 28 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 29 oct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 30 oct</td>
<td></td>
</tr>
</tbody>
</table>
On Architecture...

You employ stone, wood and concrete, and with these materials you build houses and palaces. That is construction. Ingenuity is at work.

But suddenly you touch my heart, you do me good. I am happy and I say: "This is beautiful." That is Architecture. Art enters in.

My house is practical. I thank you, as I might thank railway engineers, or the telephone service. You have not touched my heart.

But suppose that walls rise towards heaven in such a way that I am moved. I perceive your intentions. Your mood has been gentle, brutal, charming or noble. The stones you have erected tell me so. You fix me to the place and my eyes regard it. They behold something which expresses a thought. A thought which reveals itself without word or sound, but solely by means of shapes which stand in a certain relationship to one another. These shapes are such that they are clearly revealed in light. The relationships between them have not necessarily any reference to what is practical or descriptive. They are a mathematical creation of your mind. They are the language of Architecture. By the use of raw materials and starting from conditions more or less utilitarian, you have established certain relationships which have aroused my emotions.

This is Architecture.

excerpted from "Vers une Architecture." (Towards a New Architecture) by Le Corbusier 1923.

On the Education of an Architect....

Whenever you have done these things attentively and without mental bias or preoccupation, wholly receptive in your humour, there will come to your intelligence a luminous idea of simplicity, and equally luminous idea of a resultant organic complexity, which, together, will constitute the first significant step in your architectural education, because they are the basis of rhythm.

There will gently dawn in your mind an awakening of something vital, something organic, something elemental that is holding them in most exquisite balance.

A little later you will become aware with amazement that this same impulse is working on your own minds, and that never before had you suspected it. This will be the second step in your architectural education.

Later still you will perceive, with great pleasure, that there is a notable similarity, an increasing sympathy between the practical workings of your own minds and the workings of nature about you.

When this perception shall have grown into a definite clear-cut consciousness, it will constitute the closing of the first chapter and the opening of all the remaining chapters in your architectural education, for you will have arrived at the basis of organized thinking.

excerpted from "Kindergarten Chats and other writings." by Louis H. Sullivan June 1900.
<table>
<thead>
<tr>
<th>week</th>
<th>session</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>mo 03 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 04 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 05 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 06 nov</td>
<td>ARCH 163 DUE DATE: Exercise #4 “Interstitial Space”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ARCH 163 Assigned: FINAL Exercise: “Surveillance”</td>
</tr>
<tr>
<td>11</td>
<td>mo 10 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 11 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 12 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 13 nov</td>
<td>ARCH 163 DUE DATE: Assignment #3</td>
</tr>
<tr>
<td>12</td>
<td>mo 17 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tu 18 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 19 nov</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 20 nov</td>
<td>ARCH 163 DUE DATE: Assignment #3</td>
</tr>
<tr>
<td>13</td>
<td>mo 24 nov</td>
<td>ARCH 163 DUE DATE: Final Exercise: “Surveillance”</td>
</tr>
<tr>
<td></td>
<td>tu 25 nov</td>
<td>CLASSES FOLLOW A THURSDAY SCHEDULE</td>
</tr>
<tr>
<td></td>
<td>we 26 nov</td>
<td>CLASSES FOLLOW A FRIDAY SCHEDULE</td>
</tr>
<tr>
<td></td>
<td>th 27 nov</td>
<td>THANKSGIVING DAY HOLIDAY - NO CLASS SESSIONS</td>
</tr>
<tr>
<td>14</td>
<td>mo 01 dec</td>
<td>ARCH 163 - ALL FIRST YEAR SELECTIONS REVIEW</td>
</tr>
<tr>
<td></td>
<td>tu 02 dec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>we 03 dec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>th 04 dec</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>mo 08 dec</td>
<td>ARCH 155 FINAL DUE DATE</td>
</tr>
<tr>
<td></td>
<td>tu 09 dec</td>
<td>ARCH 163 DUE DATE: Portfolio Mock-Ups</td>
</tr>
<tr>
<td></td>
<td>we 10 dec</td>
<td>LAST DAY OF CLASSES</td>
</tr>
<tr>
<td></td>
<td>th 11 dec</td>
<td>INSTITUTE READING DAY</td>
</tr>
</tbody>
</table>
Studio Performance Criteria

1. Studio meets three sessions per week, Monday and Thursdays from 2:30pm to 5:45pm and on Wednesdays from 8:30am until 11:50am. Attendance in Studio is mandatory. Attendance will be taken at both beginning and at the end of the allotted Studio period. Lateness will be considered equivalent to absence. Absences are grounds for failure.

2. All students are required to work in Studio during Studio hours. All students must come to studio with sketch paper, pencil, model making materials, drafting board and all equipment necessary to do productive work during Studio time.

3. All students should have new sketches, drawings or models at each and every Studio session. All work must progress from Studio session to Studio session, and a clear development of ideas take place. The quality of your work, and your working method are observed during every studio period. This is factored into your final grade.

4. Your Studio projects will require many hours of work beyond the 9 hours per week spent with your instructor. All students are REQUIRED to do ALL Studio work in Studio. THIS IS MANDATORY. No work is to be done at home, dorm or outside of the Studio. Plan your schedule accordingly. All students should obtain Charette Passes from Elly Matzko or Jim Dyer, as per your instructor's direction.

5. All work is due when scheduled. The completion of your assigned work when due accounts for 30% of your final grade. No consideration will be given to late or incomplete work. Failure to complete equals failure of the course.

6. Excessive noise disturbs your fellow students and other Studios on the floor. No loud, abusive or otherwise distracting noise is permitted during Studio hours. Excessive noise on a regular basis will be detrimental to your overall performance and grade.

7. Any destruction of SOA property is the responsibility of the student to replace and/or repair.

8. All students are required to produce work that is their best individual effort. Indifference is failure. Hard work and determination are success. ANY WORK THAT IS HANDED IN AND DEEMED BELOW CLASS STANDARD BY YOUR INSTRUCTOR MUST BE REDONE.

Grading Policy

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Range</th>
<th>Grade</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>superior</td>
<td>4.0 - 3.5</td>
<td>C</td>
<td>good</td>
<td>2.5 - 2.0</td>
</tr>
<tr>
<td>B+</td>
<td>excellent</td>
<td>3.5 - 3.0</td>
<td>C</td>
<td>average</td>
<td>2.0 - 1.5</td>
</tr>
<tr>
<td>B</td>
<td>very good</td>
<td>3.0 - 2.5</td>
<td>D</td>
<td>below minimum</td>
<td>1.5 - .75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>failure</td>
<td>.75 - 0.0</td>
</tr>
</tbody>
</table>

233
Use a simple white 18” x 24” 2-ply piece of Strathmore flat piece of paper, create a three dimensional construction. You are to use no glue. Utilize bending, folding, cutting (but not separating), tab and slot, weaving to create your construction. If successful, you should be able to return your construction back to the original flat sheet of paper. On another simple white 18” x 24” 2-ply piece of Strathmore flat piece of paper, make a freehand drawing of your construction.

Present your final construction and your drawing for class review on Wednesday 10 September promptly at 8:30AM.
introduction
Enclosure is fundamental to the creation of Architecture. Shelter from the elements, the creation of various rooms, and the distinction between inside and outside are all due to the degree of enclosure that an architecture may provide. In this first exercise we will explore the ways in which enclosure is created, the role of the floor plane, ceiling plane and wall in attaining it and then the many degrees of enclosure and their role in defining and distinguishing space.

method
Using simple sheets of chipboard and tape, create examples of complete enclosure. What is the nature of the space produced by this enclosure? What is the nature of the element creating the enclosure itself? Is it wall? ceiling? floor? A composite of these? Is the element thin or thick? Carved out as a hollow, or solid? Composed of multiple layers? After achieving a sufficient number of these studies, create pencil drawn sections through each of your most successful studies. These will demonstrate the space enclosed. Next, attempt to imply an enclosure, utilizing a minimal of elements. Reduce this down to the least amount of elements that will still create a sense of enclosure, close to the moment when enclosure is lost. Again, draw pencil sections through the most successful of each of these studies.

presentation
Select from your most successful studies and construct a final model of both your complete enclosure and your implied enclosure in white two-ply Strathmore Paper. Neatly construct and draw one section of each of your complete and implied enclosures in pencil on another piece of two-ply Strathmore Paper.

Present these two models and two drawings for class review on Wednesday 24 September promptly @ 8:30AM.
Flexible Column

Introduction
Structure is the underlying support and organizational device of Architecture. The structural system of a work of Architecture is the internal logic that enables that work of Architecture to be held upright. Additionally, the proper use of structure is a discipline upon the design of architecture, an intellectual pursuit of order which reverberates throughout the entire building. In this exercise we will explore the role of the column, the wall, the overhead beam as elements of order. Issues of compression and tension will be introduced and experimented with.

Method
In model form, devise a simple structural unit, whether it be a wall unit, trabeated unit (post and beam) or a tensile unit (cable and stay). Now, using your unit as a single building block as it were, develop this unit into a complete structural system by use of repetition. Three-dimensionalize your system into the x, y and z coordinates. Once you have developed a monolithic structural system, introduce diversity into your system, such as voids, counterpoint rhythms, a:b proportions, bay differential, geometry. Construct study models of these strategies.

Presentation
Select from your most successful studies and construct a final model of both your standard structure and your diversified structure. These models should be about the size of a backpack.

Present these two models for class review on Wednesday 08 October promptly @ 8:30AM.
introduction
Surface is the physically observable component of an architecture. Our perception of the architecture is first formed by the appearance of the surface of it. While closely related to enclosure, surface has in and of itself identifiable traits, be it texture, color, pattern, tautness, transparency or translucency or other such characteristics.

method
Starting with your structural model, or other appropriate substrate, experiment with a range of appropriate surfaces that can be applied to your structural models. Is your surface thin or thick? Transparent or opaque? Taut or gathered? Experiment with different materials and methods of attachment which you feel are most appropriate considering the type of structure you have devised. Draw in pencil an elevation of your various surfaces from various view points. How do these drawings inform the surface?

presentation
Select from your most successful studies and construct one final model of your surface over your structure. Construct on two separate sheets of 2-ply Strathmore paper two elevational drawings, each rendered to show materiality. On an additional sheet construct a section through your model to reveal the quality of the space and surface interaction.

Present this model and three drawings for class review on Wednesday 22 October promptly @ 8:30AM.
Introduction
This exercise introduces the concept of space, specifically the space between. Space is neutral, unformed until it is contained by something physical. You will explore how space is created, as well as the spatial tension that can be caused by the proximity of objects. In this way you will begin to explore the inherent spatial dynamics of urban space, the formed between buildings in a city.

method
Create a series of objects which have an incomplete nature about them. Sculpt these objects to cause complementary surface voids and incisions. Arrange these objects in such a manner as to cause a strong relationship between each. Study by use of drawing the shape and characteristics of the spaces between your objects as if they were actual objects themselves. Make a drawing which describes the relationship of the spaces between.

presentation
Select from your most successful studies and construct one final model of your interstitial space. Cut three sections which best describe the nature of the space which you have created. Draw and render these carefully in soft pencil on separate sheets of 2-ply Strathmore paper. Neatness and precision is of utmost concern here.

Present this model and three drawings for class review on Wednesday 05 November promptly @ 8:30AM.
introduction
This exercise is an opportunity to demonstrate the architectural properties you have been exploring throughout this semester. Issues of boundary, enclosure and view will be connected with the introduction of "site".

site
You are given a hypothetical site with a grade change that forms a "step" condition. Upon this is a denoted boundary shown on your site plan drawing (see reverse of this sheet) as a dashed line. Beyond this dashed line is an zone of forbidden trespass. North is given.

program
Upon this site you are to design a construction which does two tasks: one, it should serve as a marker of the boundary in some way and, two, it should allow observation into the zone. Your actual construction cannot enter into the adjacent zone, nor may any other part of your design do so. Your construction should allow for the viewing into and across this area of forbidden trespass.

method
Construct at 1/16 inch equal one foot scale a study model of your site. Develop multiple studies which help define the boundary on the site and allow for observation. Develop your ideas in sketch and drawing form. Develop the strongest of these studies for larger scale development.

presentation
Construct a final model in basswood at 1/8" = 1'-0" scale. Construct on separate sheets 2-ply strathmore paper two floor plans (if applicable), two elevations and two sections all at 1/8" = 1'-0" scale. Construct either a axonometric view or a perspective view of approach to your design. Render all drawings for shade and shadow and texture. Your studio instructor may have additional presentation requirements. Neatness and precision is of utmost concern.

Present your model and all drawings for individual studio review on Tuesday 25 November promptly @ 2:30PM.

Final Selections Review on Monday 01 December.
Portfolio Presentation Wednesday 03 December @ 8:30AM.
Problem as Defined: Design a structure for a contemplative person to meditate daily upon the view at sunrise, mid-day, and sunset. Remember, given the required placement of your design on the site, the 12 foot change in elevation on the site, and the view to the east, this project is essentially about circulation and movement. That is, in order to see the view, what you design must elevate the observer by at least 12 feet. Therefore, a staircase and/or ramp, ladder etc. is required to solve the problem, and in our studio’s case, a place or places within the “circulation system” that creates for the observer opportunities to experience and meditate upon the path of movement of the sun in the sky, from sunrise to sunset. In addition, other elements you should consider include how to create a sense of approach, beginning or “entry” to your “meditation structure,” and how to shape or frame at least three different views (of the sunrise, mid-day sky, and sunset). You should also think about the nature of meditation as a spiritual and personal ritual and the kind of spatial experience that would support and enhance that activity.

NOTE: It is absolutely essential that you adhere to this schedule of assignments and due dates in order to complete this culminating project in a way in which you and I can both take pride. Failure to keep on schedule will adversely affect your project grade. I will be noting each class if you have completed the required assignment, and factoring in that information in determining your project and final course grade.

WED Nov 12th: Desk crits.
DUE: two study models @ 1/8” scale that investigate two different conceptual approaches to solving the problem, and a series of freehand sketches that analyze patterns of light and shadow on the site in relation to your proposed designs.

THUR. Nov. 13th: Desk Crits

2:30-3:00PM: Discussion of reading assignment on Frank Ghery’s new Guggenheim Museum in Spain

DUE: One revised and more developed study model of a concept that you can discuss and explain, with freehand sketches analyzing the path of the sun, patterns of light and shadow on the site and within your designed structure, and views to the sunrise, mid-day sky, and sunset from your structure.
MON. Nov. 17th:
DUE:
Refined and further developed version of 1/8" scale model and freehand analytical sketches reviewed on Nov 13th. By the end of class, a written concept statement will also be produced (see below)

1:00-4:00PM, Prof. Weisman will be a visiting juror in a 4th/5th year options studio review of a new dormitory for NYU Law School in room 420 Colton.

2:30-3:00PM, all students will join Prof. Weisman and sit in on the upper class review. Don't be late. Pay particular attention to the verbal presentations by students of their own projects and the kinds of drawings and models they use.

3:00-4:00PM, you are to return to studio and form 4 study groups consisting of three students per group (one group will have 4 students in it since there are 13 of you). You are to work with each other in these groups for the next hour by describing your design concepts to each other, using your study models and sketches. The purpose of this collaboration is to help each of you to develop a clear verbal and written statement that accurately describes your design concept or idea for this project. Each student should spend the last 15 or 20 minutes of this hour writing down their own statement and reading it back to the group to be sure it is understood by all.

4:00-6:00PM, Prof. Weisman will return to class and meet with each of the groups for 30 minutes to review each student's presentation of their concept statement.

WED. Nov 19th: Desk Crits: DESIGN CONCEPT FINALIZED
DUE:
- Revised study model @ 1/8" scale
- Revised written concept statement to be used to present your project
- MINIMUM THREE PENCIL DRAWINGS @ 1/8" SCALE THAT BEST SHOW YOUR CONCEPT. Choose from plan(s), section(s), and/or elevation(s).
  Note: you should do more than three drawings if needed to fully explain your design concept. eg. two floor plans, two sections, three elevations etc.
- ONE PERSPECTIVE AND/OR AXONOMETRIC DRAWING of your project, rendered in pencil on two-ply strathmore paper, that shows an important view from inside. Be sure to chose to draw a part of your project (the approach or entry, inside looking out or down, an ascending staircase etc.) that reveals contrasts in sunlight and shadow or shade and/or views to the sunrise or sunset.
THUR. Nov 20th: PRELIMINARY REVIEW: PIN UP
DUE:
- Final study model @ 1/8" scale
- A written concept statement describing your project that you will use to present your work
- A set of 1/8" scale drawings carefully composed on two-ply strathmore paper rendered in pencil with appropriate line weights, shade, shadows and textures.
- One perspective or axonometric showing an important view (see above)

Each student will be given 15 minutes time to present their work to the class and to receive feedback on their presentation as a "rehearsal" for Nov. 25th.

NOTE: This work should be your final, finished, best work and will be saved and re-presented at the final review on Nov. 25th. The rest of the time should be spent on the completion of a finished ¼" scale model (see below)

MON. Nov. 21st: Final Desk Crit
DUE:
At this point you should have an almost complete ¼" scale model in basswood and other materials as appropriate. The site need not be included in this model. Rather, you should concentrate on expressing the structure, "interior" spaces and the scale of the project. Plan to include a "scale figure" of a person that can be moved and removed from your model.

TUES. Nov. 25th FINAL STUDIO REVIEW (in class with invited guest critics)
DUE:
ALL WORK PRESENTED IN THE PRELIMINARY REVIEW AND THE FINAL ¼" SCALE MODEL
All requirements must be finished and included in this presentation. No extensions of this deadline are possible

The final grade for this project will include an evaluation of the following:
1. The power and imagination of your concept and the clarity of your verbal presentation
2. The beauty and accuracy of your drawings
3. The craft and care taken in executing both of your models
4. How well you prepared for each class by having the required assignments completed on time

MON DEC 1ST FINAL FRESHMAN REVIEW
Two projects from each studio will be presented to a jury of guest critics
Leslie Kanes Weisman earned a MA degree in urban studies (summa cum laude) from the University of Detroit in 1973 and a BFA degree in interior architecture (cum laude) from Wayne State University in 1967. She is currently an associate professor and former associate dean of the School of Architecture at New Jersey Institute of Technology which she joined as a founding faculty member in 1975. In 1995 she was the George A. Miller Endowment Professor at the University of Illinois at Urbana-Champaign and has also taught at Massachusetts Institute of Technology (1986), Brooklyn College (1980), and the University of Detroit (1968-1974) where she held appointments in architecture, planning, and women's studies. In 1994 she was a visiting scholar at Case Western Reserve University in their National Endowment for the Humanities Summer Institute on Technology and Culture for college faculty. In 1986 and 1989 she served as a consultant to the New Jersey chancellor of higher education, developing strategies for integrating scholarship on gender and multiculturalism into the curricula of the state's colleges and universities.

Professor Weisman is a co-founder and coordinator of Sheltering Ourselves: A Women's Learning Exchange, an international association committed to developing affordable housing and economic opportunities for low-income women and their families, ongoing since 1987, and the Women's School of Planning and Architecture (1974-1981), a national summer program for women in the environmental design professions and trades. She is also a co-founder (1977-1982) of Networks: Women in Architecture, a New York based professional organization.

Professor Weisman serves on the National Architectural Accrediting Board School Visitation Teams and has received numerous awards including the 1994 Association of Collegiate Schools of Architecture (ACSA) National Creative Achievement Award bestowed for "the quality of her teaching and for a sustained body of work in multiculturalism and community service," the 1993 NJIT Foundation Overseer's Award for Public and Institute Service, and the 1990 New Jersey Institute of Technology's Excellence In Teaching Award. In 1984, Weisman was honored by the mayor of Cincinnati who proclaimed October 5 "Leslie Kanes Weisman Day" in the city, in recognition of her "...national acclaim as an educator (and)...outspoken advocacy for improving the design of houses and communities to serve the needs of all urban citizens regardless of race, class, or gender."

Weisman’s community and political activities have included memberships on the executive boards of the Fairmount Housing Corporation; National Organization For Women (NOW); National Women’s Agenda Task Force on Housing; the Astraea Foundation; the National Women’s Political Caucus; and the New Jersey Regional Health Planning Council.


A sought after speaker, Professor Weisman has delivered keynote addresses and featured talks at international, national, and regional conferences sponsored by the American Institute of Architects; the Royal Australian Institute of Architects; the Association of Collegiate Schools of Architecture; The American Society of Landscape Architects; the American Planning Association; and the United Nations, among others, and has been invited to lecture at more than 50 universities throughout North America and Australia.

January, 1997
full curriculum vitae available upon request
Building a Revolution

As we are growing up, we are taught that the responsibility for social change belongs to all of us. Only through our own personal efforts as individuals can we eliminate prejudice, inequality, repression and hatred. But the older we get and the more immersed we become in the demands of our personal goals and careers, the easier it is to forget how much other people, and the future of the world, depend on each and every one of us. It is up to us to help shape this world into a place where every person is equal, where every person has the opportunity for employment, housing and education, where every person is a valuable resource, where every person's uniqueness is celebrated and revered. The life and career of Leslie Kanes Weisman, architectural educator, feminist and activist, is our reminder.

As associate professor and past associate dean of architecture at New Jersey Institute of Technology (NJIT) in Newark, Professor Weisman encourages socially responsible behavior in academic, professional and social ways. Besides teaching architecture students in classes that require community service, sustaining an active, national lecture itinerary and chairing the university's Committee on Excellence in Teaching (the group of previous award winners that selects recipients each year), Weisman is a co-founder of several women's professional organizations, a published author, community service activist and pro bono architectural consultant for projects as diverse as Iris House in Harlem, a center for women living with HIV/AIDS, to directing a design/research team on the development of an interactive therapeutic garden for a new multi-million dollar regional children's hospital in Newark.

An educator who is dedicated to social justice, Weisman's classes at NJIT are extensions of her personal and political efforts. Defined by "service learning," Weisman's courses are dedicated to a socially responsible design education, a philosophy she claims is integral to the health and prosperity of the architectural and design professions and the people who use their products and services. According to Weisman, "Service learning, in which students work directly as volunteers with nonprofit, community-based organizations, provides a unique context in which to teach and practice socially responsible design. When students realize they are responsible and accountable to others as designers, they begin to design in an empathic mode."
allowing them to empower others through their work rather than merely imposing their own images upon the world."

In Weisman’s course “Architecture and Social Change,” students focus on the architectural and planning implications of health care, the environment and the global need for adequate shelter. Students are required to volunteer 20 hours of community service to a non-profit agency addressing social problems dealt with in the course. Past projects have included the addition to a senior citizens’ center; the renovation of a shelter for homeless adults; the rehousing of 50 low-income rural families displaced by fire; and the design and construction of an outdoor, hands-on environmental education laboratory and garden to help inner-city elementary schoolteachers integrate environmental education and ecology into the public school curriculum. As a result of the class requirements and the personal satisfaction they received from their work, many of Weisman’s students have continued their volunteer work beyond the necessary hours. Several have accepted full-time paying jobs with the organizations upon graduation from NJIT.

“Problems in Modern Housing” allows students to tackle controversies in modern housing that will affect their professional as well as personal lives including topics such as racial integration versus segregation; government subsidized versus private sector housing; homelessness and the shelter system; affordable and energy-efficient housing technologies; and the roles of the architect, contractor and developer. The subjects are addressed in both a position paper and a team class debate.

A third course, “The AIDS Facilities Design Studio,” provided students with the opportunity to work with real clients and expert consultants on the design of a new building type of social importance that will actually be built. Her fifth-year students’ spring 1992 project was a residential, child care and community center for women and children with HIV/AIDS, their families and neighbors.

More than three decades ago, Weisman found her sensibilities and values reshaped by the women’s movement. The exhilaration of sisterhood and her enduring outrage at the indignities of institutionalized sexism, racism, classism and heterosexism altered Weisman’s sense of self as well as her perceptions of the world and her own role as an architectural educator.

During this time, Weisman was employed at a private Detroit, MI, university, teaching young, white males how to create beautiful buildings for those who could afford to pay for them. Simultaneously, she was devoting herself to feminist activism directed toward creating equality for women and minorities.

Through her co-founding of various feminist organizations and her community volunteer work, Weisman developed what she calls a “feminist spatial consciousness,” a way of seeing and understanding the social organization of our patriarchal
society from a spatial perspective.

Weisman writes, "The dichotomy by which patriarchal social space is organized classifies people into opposing and unequally valued groups of rich/poor; white/black; young/old; straight/gay; male/female. This organization also defines the way patriarchal society conceptualizes metaphysical space, such as heaven and hell, and physical space, such as the workplace and dwelling, cities and suburbs."

Weisman points out how social space and built space reflect and rebound upon each other. "Women will never be equal in the public workplace until the private, domestic workplace is redesigned to reflect the awareness that we are all, irrespective of gender, responsible for the places in which we live," predicts Weisman.

Not surprisingly, the fight for equal opportunities for women has consumed Weisman throughout her adult life. Toward that end, she has been involved in initiating several programs designed to increase women's professional and personal achievements and to empower women and the disenfranchised in general.

The Women's School of Planning and Architecture (WSPA), which Weisman co-founded in 1974 along with other women in the fields of design education and practice, was a forum in which to discover the particular qualities, concerns and values that women bring to the practice and teaching of architecture and planning. Operated until 1981, the school was the only one of its kind to be conceived by, founded, financed and run by women and for women.

WSPA was not created by women with a common political goal. Rather, says Weisman, "It was about women's desire to collaborate with other women, and to struggle to make greater sense of their own lives and their lives' work through this process."

In testament to the school's impact, many WSPA participants went on to found construction and development companies; design and build housing for low-income and single-parent women; and develop new areas of scholarship and feminist theory on women and environments.

Sheltering Ourselves: A Women's Learning Exchange (SOWLE), founded in 1987 by Weisman and several other women, built upon WSPA's successes. This ongoing international educational forum on women's housing issues was expanded to include more non-professional women: women of color; and women active in shaping their own communities as housing advocates, leaders in tenant management and shelter founders. The skills shared by the participants are as diverse as grant writing and housing administration to financing, construction and design.

"SOWLE empowers and transforms the lives of women by sharing information with women interested in designing, building, rehabilitating and owning transitional and permanent housing that includes support services essential to women: child and health care, family planning, job counseling and training, employment and transportation access," says Weisman.

While she is known across NJIT's campus for her innovative courses and hands-on teaching style and throughout her community for her generous involvement in social organizations, Weisman's reputation is spreading across the country—indeed, soon
In spring 1992, Weisman's five-year design studio students developed site-specific residential and community facilities for families facing the challenge of HIV/AIDS. Christopher Mann's scheme helps users develop spiritual strength and repose in their final days. The design includes a central courtyard landscaped with seasonal planting for residents, whose private rooms are located around the interior perimeter of the court. The curved walls of the dining hall, meditative chapel and garden articulate special shared spaces.

Across the world—as a result of her recently published book, *Discrimination by Design: A Feminist Critique of the Man-made Environment* (University of Illinois Press, 1992). An endeavor that took Weisman more than a decade to research and assemble, the volume is a discussion of man-made space in all its forms and how those spaces limit human beings and exclude, dismiss and devalue women, minorities and other marginalized groups. Acclaimed as an "architectural best-seller," "one of the most important books for our time" and "a pioneering contribution not only for feminists, but for all those interested in the environment and social issues," the book is a call to arms—not the arms of a militaristic, patriarchal society, but rather the arms of a people that could uphold, encircle and support the most vulnerable and needy members of society. *Discrimination by Design* is an invaluable guidebook for the architect, planner, designer and policymaker. Through its pages, the book offers insights as to how both industry professionals and concerned citizens can begin to break down the walls of gender, race and class discrimination. (For a review of the book, refer to the November/December 1992 issue of *Interiors & Sources*.

For example, Weisman claims that developing new models of supportive housing for people with AIDS (PWAs) also will benefit other groups in need of healing, shelter/care environments, including the elderly (who, along with PWAs, are the largest growing group of the health-care needy); single parents; battered women; those with chemical dependencies; and disabled persons. In addition to offering design expertise, Weisman suggests that architects should help rewrite and develop new, flexible zoning ordinances, building codes and licensing regulations to permit affordable design innovation.

"Architects need to be vocal, via public hearings and meetings of housing authorities and neighborhood planning boards supporting the creation of new housing, community centers, quality public child care and community-based health care facilities," recommends Weisman. For the benefit of the general population and to counteract the Not-In-My-Backyard (NIMBY) syndrome, Weisman says, "Educators and practicing professionals should collaborate on developing design studios, lectures and public exhibitions, as well, to raise awareness using the powerful persuasion of architectural drawings and models to help people visualize how well-designed facilities for those in need can be life-giving places of community pride and involvement."

Weisman also suggests that architects advocate the legalization of accessory apartments in suburban houses and design these units to life-safety codes, a move that would provide low-cost, suburban rental housing that supports extended family living and increases housing density without destroying more environmentally critical open land. With the increase in the aging population, the shaky economy and the majority of non-nuclear family households, accessory apartments are an affordable housing option that deals realistically with the changing ways Americans live their lives.
Weisman, herself a part of a non-nuclear family household, applied her own theories to redesigning a summer cottage she and two close friends bought in 1985. When the two friends’ career lives afforded them the chance to work out of their home, the trio decided to renovate and build on to their Long Island, NY, structure. The project was a design experiment that allowed Weisman to put into practice the principles she teaches her students—namely, how to “recycle” existing detached housing to make it more affordable, energy-efficient and better suited to the needs and lifestyles of today’s diverse households. She even assigned the transformation of her home to her second-year design studio students to introduce them to a real-life design problem.

In 1989, Weisman created her own design scheme that added to their original, modest 18- by 36-foot cottage, another 18- by 36-foot wing oriented along the side street of their corner lot. The addition’s exterior was cranked to sit along the property set back that parallels the side street, creating two equal, primary front facades with their own entries and driveways to express and support the privacy and independence of the three owners. A dining pavilion overlooking the private rear gardens sits in the “hinge” between the two volumes. The new wing is completely self-sufficient with a galley kitchen and living/dining/sleeping space.

The design was implemented so that both wings can be closed or opened to each other through a sliding wall. The addition is wheelchair accessible, except for the second-story study and meditation tower. The tower overlooks the gardens and Long Island Sound and is oriented to the sunrise and sunset, thereby acting as a passive solar chimney and cooling tower for the addition. The house and extensive gardens Weisman designed were included in the Southold, NY, Historical Society’s House and Garden Tour this past summer.

“When the house was completed in 1990,” recalls Weisman, “I presented my work to my students in a studio ‘pin-up’ with slides documenting the demolition, renovation and new construction process as well as the garden construction and planting.” The students were invited to visit the renewed structure for a graduation party the year they earned their Bachelor of Architecture degrees.

During one of her recent speaking engagements, Professor Weisman was introduced with the following praise: “She deciphers complex problems and provides realistic
The same was designed to accommodate and acknowledge in new owners: three supportive adults with both shared and independent lives, each in need of private, inviolable work space.

...and understanding of academic subject matter, per se, but the collective process through which each person is able to define life and change it. Feminist education is based on the morality of political responsibility, accountability, empathy and rigorous self-examination, and begins with defining the self and the community to which the self belongs. Feminist education means searching to fully understand the social forces that have shaped our individuality and then locating that self in the world, understanding the true nature of the 'we' that each self feels herself or himself a part of.

Defining ourselves and our space in a new way can lead us to transform our world and the people in it. Professor Weisman reminds us that it is our responsibility, and the duty of designers and architects, to instigate social change and sensitive design that will value and respect each and every person on this planet, as well as the planet itself. For Weisman, this goal is not an option. It is a survival imperative, and one we all must heed, she says, "if we are to design a society in which all people matter." 

For more information on Sheltering Ourselves: A Women's Learning Exchange (SOWLE), contact SOWLE, c/o The Women's Research and Development Center, 727 Ezard Charles Dr., Cincinnati, OH 45203.
Atelier de Le Corbusier.
Rue Nungesser-et-Collar, Bougogne-Sur-Seine
photograph by Rene Burri, 1960 (Magnum)
FEATURES

Saving the **Soul** of Architectural Education

FOUR CRITICAL CHALLENGES FACE TODAY'S ARCHITECTURE SCHOOLS

by Lee D. Mintzang

An emotional, often-painful clash is taking place at architectural schools across the country amid growing doubts over whether the traditional educational environment is preparing students for a rapidly changing world outside. A number of schools have made valiant progress in connecting what they teach to the diverse communities they serve. And at its best, the design studio is getting long overdue recognition on some campuses as a model of excellent learning.

Still, at the very moment when the profession badly needs more flexible, worldly, empathetic, and diverse graduates, too many schools remain wedded to shopworn traditions and curricula that glorify a single model of architect-as-designer, give short shrift to liberal studies, offer only brief nods to non-Western history and theory, neglect the rich potential of computer technology, and stress competition for more than teamwork.

Visits to numerous campuses, discussions with scores of students, educators, regulators, and practitioners, as well as an examination of a dozen accreditation reports prepared during the 1996 academic year, have convinced me that while the focus of the debate over architectural education has often been on the bitter divisions between schools and the world of practice, the more alarming gap is the one dividing both schools and the profession from the needs of the public which architecture could so effectively address.

The time has come for educators and practicing architects to close ranks around addressing four of architecture education's toughest challenges, each essential to the goals of leading the profession to a future of greater relevance and responsibility.

Use computers to connect students to a world of viewpoints

If there's a single symbol of the clash between past and future in architecture education, it's the computer.

The struggle, or at least one aspect of it, plays out each day at student Wes Harp's studio workstation at Mississippi State University's School of Architecture. Recently, Wes was designing an observation...
of computer hardware and software, let alone faculty training, are expensive new burdens beyond the means of some schools.

Still, 25 years into the technology age, it borders on educational malpractice that so many faculty members have yet to master computers well enough to teach them comfortably in studio. At many programs, one or two faculty continue to carry much of the burden as "computer gurus." And incredibly, one still hears of students who feel obliged to hand-trace their computer renderings to conceal from some faculty that their work was generated on a computer.

A few schools such as Mississippi State University, Texas A&M, the University of Southern California, the New Jersey Institute of Technology, and MIT have advanced the frontiers of visualization technology, and have moved aggressively to incorporate computers into design education. Roughly a dozen schools require students to purchase CAD-capable laptops. Mississippi State has sought to strengthen its own pool of computer expertise by introducing, this year, a master's degree in digital design, which has made graduate students available to help undergraduates with their computer struggles. And individual faculty have produced impressive research exploring how computers are changing the products and processes of design.

What deserves even more attention is how computers, as tools of global communication and information-gathering, can open studios to many cultures and viewpoints, and over time, even help transform the teacher-student relationship. At Carnegie-Mellon University, students are using web home pages to display their work. And a few schools have begun "online juries," in which students display their projects on web sites to be critiqued by architecture experts and faculty around the world.

At Ball State University, for example, David Mackey, who teaches a fourth-year electronic design studio, says his students use the Internet to identify and contact "remote critics"—architects around the world who are experts in the knowledge area of projects in which they're working. Students display their designs on their own home pages and "remote critics" from as far away as Italy send critiques by e-mail. One result: Mackey's own role as sole authority over student work has been transformed.

"Suddenly," says Mackey, "there are more than fifteen critics in the studio. As a teacher, I become a facilitator and fellow learner, rather than the only expert. We can now run a global design studio, which also has implications from a cultural point of view. The student is no longer presented with a single linear path to design."

Such changes aren't just cosmetic. Last spring, students in Mackey's class entered a competition sponsored by the Association of Collegiate Schools of Architecture (ACSA) to design a "hotel of the future," and his students won two of the six prizes.

It's time—indeed, past time—for more schools and faculty to join the computer revolution with both feet. Along with their impact on making design a more integrative process, computers, as tools of information, communication and analysis, can open studios as never before to the concerns and perspectives of communities around the world.

End apartheid in architecture schools

Martin Moeller, executive director of ACSA, recalls a recent "architecture career day" at a public school on Capitol Hill in Washington, D.C. "The student body at the school was mixed, but the program drew an overwhelmingly white crowd. A good mix of boys and girls, but in terms of race, it was astonishing," Moeller said.

The race record of architecture education is a continuing disgrace, and if anything, things seem to be worsening. In 1992, there were 2,172 African-American architectural students, 5.9 percent of the national total. By 1996, the number had actually dropped to 2,018, or 3.4 percent. Just 3.2 percent of all architecture faculty—123—were African-American. Of those, 40 in the entire nation were tenured. Put bluntly, it's hard to imagine that this profession can ever lay claim to leadership in shaping the built environment when it remains so unreflective of late 20th-century America.

Over the years, individual faculty, many now graying veterans of the civil rights era, have carried on lonely battles to make their schools more welcoming to minority students. Lately, the thinking seems to be that a more inclusive curriculum is key: adding non-Western perspectives, promoting scholarship aimed at documenting how persons of color have shaped architecture here and abroad, and offering more studios that connect architecture to community concerns.

Many such efforts have been documented by Sherry Ahrentzen of the University of Wisconsin-Milwaukee in a new ACSA publication, Doing Diversity. Kathryn Anthony, for example, teaches "Gender and Race in Contemporary Architecture" at the University of Illinois. "The American City Since 1940: Class, Race, Gender, Culture, Space," is taught by Thomas Dutton at Miami University in Ohio. "Asian-American and African-American Environments" is offered at California Polytechnic State University-San Luis Obispo by

256
EVEN WHEN THE WILL IS THERE, THE GOAL OF DIVERSITY OFTEN COLLIDES WITH OTHER PRIORITIES IN COMPETING FOR SCARCE RESOURCES.

Christopher Yip and Brad Grant (who has since moved on to historically black Hampton University). Nonetheless, with only tepid support from the profession, and with recent anti-affirmative action federal court rulings clouding the picture even further, schools of architecture are throwing a party to which few in the minority community are likely to come any time soon. In the short run, the number of African-American students will probably remain tiny and concentrated mainly in historically black institutions and a handful of urban public institutions.

"Unless there's a concerted effort—more than just one or two committed people in a department—I see things continuing to dwindle. Why should it be any different?"

What can be done to reverse this pattern of ineffectiveness? On campuses, the first steps must be taken by university administrators who have an obligation to provide resources for faculty and student recruitment. Presidents, provosts, and deans also have to ensure that campus rewards and priorities work for, and not against, the goal of diversity.

"I've given every dean on campus a blank check to hire minority faculty," said Dr. Derek Hodgson, provost of Mississippi State, a school that seems as sincere as any in wanting to issue a welcome to people of color. But his school also illustrates how tough the obstacles can be. Not only is it hard to find African-American faculty for the architecture program, says Hodgson, it's even harder to find persons of color willing to relocate to Mississippi.

Even when the will is there, the goal of diversity often collides with other priorities in competing for scarce resources. Said Dr. Melvin Ray, Mississippi State's vice president for research: "Let's say that as a dean, I have to decide whether to spend money to send a faculty member to a conference, or make a generous offer to recruit an African-American to a conference, or spend money recruiting for African-American students in Jackson, or make a generous offer to recruit an African-American student to a conference, or spend money recruiting for African-American students in Jackson..."
the professional or academic backgrounds of faculty badly misses the point, and could create greater mischief by arbitrarily eliminating many able studio teachers, eroding the already-weak research capabilities of architecture faculties, and endangering the diversity of faculty, which is one of architecture education's greatest strengths. Above all, it ignores the reality that while the profession may be the most important constituent of architecture schools, it is not the only one. Many students will never design buildings, and so faculty have to be equipped to educate for a variety of careers.

"I don't think a faculty member who teaches design should have to be licensed," said Gregory Hunt, dean of Catholic University's School of Architecture and Planning. "I've seen faculty who have never built a room who are outstanding as teachers."

"The profession is thinking narrowly," agreed Kent Hubbell, chair of the architecture department at Cornell University, one of the Ivy League schools which graduates a large number of future architecture teachers. "In the end, the good school is a mixture of all of the above—practitioners and scholars.

The focus for renewing teaching should be on creating a more capacious academic and scholarly climate on campus that encourages professional faculty to have a better balance of backgrounds, including practical experience and Ph.D.'s. It's up to administrators to establish a harmonious atmosphere in which diverse faculty can coexist and learn from each other's strengths and experiences, rather than becoming factionalized. Schools like the University of Oregon have helped set the stage for more collegiality by requiring faculty to teach both studio and lecture courses.

Schools also should get more serious about supporting teaching ability—rewarding excellent teachers with tenure and promotions, and remedying it where weak. In a comprehensive survey in 1994 conducted by The Carnegie Foundation for the Advancement of Teaching, nearly 60 percent of architecture faculty agreed that their schools would benefit from sustained teacher training.

"Teachers should have a professional understanding of what they teach. But the fundamental issue is, here's the range of stuff we need to teach. Is the faculty qualified to teach it?" said Jerry Finrow, the dean of the University of Washington's architecture program.

Finrow added that a key is placing the right faculty in appropriate studio levels. For example, lively teaching skills may be more important than licensure as a qualification for teaching beginning studios. "In beginning studios, faculty should be extremely good at instilling enthusiasm and helping students make the transition to young designers. A stiff guy in a beginning studio is a disaster."

Finally, and most essentially, teachers must serve as models of connecting learning to the larger purposes of the profession and communities. A program that encourages faculty to become community activists is Arizona State University. One member of the faculty is the
architectural critic at The Arizona Republic. Several others are involved in television programs about architecture, while others serve on commissions that shape projects both on and off campus.

To renew architecture schools, then, the answer lies not in mean-ax solutions aimed at banishing unlicensed faculty, but in a more rational approach. The keys are to ensure that teachers can really teach, that teachers are appropriately placed in their areas of strength, and that what is taught is firmly grounded in the notion of service to the profession and the public.

Connect learning to life

The most essential challenge is to change the content and culture of studios to prepare graduates to practice competently, as well as to lead the profession to a broader definition of its ideals.

Here, there's reason for optimism. A growing list of schools and individual faculty have lately done inspiring work in connecting studios to community concerns, and in producing meaningful research from these experiences.

The Southern California Institute of Architecture (SCI-ARC) in Los Angeles, for example, now requires all students to work on community-based projects developed by its newly formed City Practice + Research Center (CPR). Besides giving students the experience of direct involvement with a variety of community-design problems, the goal is to develop a community clearinghouse for design research. The CPR curriculum has students designing public housing for people with AIDS, teaching high school workshops in collaboration with the Esperanza Housing group in an impoverished Los Angeles neighborhood, and designing a meditative garden at the Veterans Administration Hospital in West Los Angeles.

At the New Jersey Institute of Technology in Newark, Professor Leslie Kane's "service learning studios" offer as clear an example as any of how community-oriented design studios can transform the outlook of both future architects and clients. Her studios have had students designing housing for AIDS children in Newark. They have also worked on designing sustainable buildings for the Grail Community, a Christian society in Cornwall-on-Hudson, N.Y., dedicated to empowering women globally and promoting environmental justice.

From the first day of class, students learn that Weisman's studios are dramatically different. Instead of students simply claiming work space, Weisman challenges them to think together as a team about how available studio space ought to be used to fit functions.

"I sit everybody down and tell them we are doing a 'design research collaborative.' We need conference space. We need a model-making area. We need community space. So I ask them to measure the room and come back with a floor plan. We make decisions by consensus, and then we look for good, refined ideas. We come up with a composite and proceed to build it. Only after we determine who in the class is going to do what, do students claim space. Students learn that cooperation doesn't have to stifle individual creativity. At the epicenter of this is a sharing of power."

As projects proceed, work and research are evaluated by the group as a whole in terms of its value in solving the problems of the client. Weisman also calls upon students to evaluate their own work:

"Did you meet your own criteria? Was this a valuable educational experience for you?"

Jason Klimowski, a student in the Grail studio in 1994 who now works in a Newark firm specializing in historic preservation, said his experience in Weisman's studio is still paying dividends: "The research we did then is still valuable to me. We had to learn how to present our ideas to groups, how to speak publicly, and how to meet with real rather than theoretical clients."

The clients of Weisman's studios, for their part, say the experience changed their attitudes about architects: "The design work the students did on housing for us was excellent, very creative," says Peg Linehan, a member of the Grail Community. "I never worked with an architect before, and all I had was the stereotype of someone who is very technical, and that I would have to understand the lingo. I did not expect that an architect would be interested in learning what we were about."

Says Prof. Weisman, "Students need to see the optimism in communities, the intelligence in community, and the desire to solve their problems. Architecture students can play an important role in this—providing models of what could be."

Diana LeFevre, who took Weisman's AIDS studio and is now in private practice in Hunterdon County, N.J., said the experience was crucial to her professional outlook. "The day we went to see the kids with AIDS was probably the most difficult and powerful day I've had in architecture," she said. "It was the best way to end my school career. If I could find a job that would bring me half as much fulfillment, that's what I'm seeking in my professional life."

...PREPARE GRADUATES TO PRACTICE COMPETENTLY AND LEAD THE PROFESSION TO A BROADER DEFINITION OF ITS IDEALS. This and more are the answers schools and individual faculty are doing inspiring work in connecting studios to community concerns, and in producing meaningful research from these experiences. The keys are to ensure that teachers can really teach, that teachers are appropriately placed in their areas of strength, and that what is taught is firmly grounded in the notion of service to the profession and the public.

Four challenges and more

These four challenges—using computers to open studios to a world of different viewpoints, increasing racial and ethnic diversity, putting greater value on teaching, and connecting learning to life and community needs—are certainly not the only ones facing architecture schools. But they are among the most nettlesome and, in several cases, the most chronically neglected. Yet each holds the promise of helping to create a profession more accessible and empathetic to a far broader, more diverse community.

Students need to see the optimism in communities, the intelligence in community, and the desire to solve their problems. Architecture students can play an important role in this—providing models of what could be.

The clients of Weisman's studios, for their part, say the experience changed their attitudes about architects: "The design work the students did on housing for us was excellent, very creative," says Peg Linehan, a member of the Grail Community. "I never worked with an architect before, and all I had was the stereotype of someone who is very technical, and that I would have to understand the lingo. I did not expect that an architect would be interested in learning what we were about."

Says Prof. Weisman, "Students need to see the optimism in communities, the intelligence in community, and the desire to solve their problems. Architecture students can play an important role in this—providing models of what could be."

Diana LeFevre, who took Weisman's AIDS studio and is now in private practice in Hunterdon County, N.J., said the experience was crucial to her professional outlook. "The day we went to see the kids with AIDS was probably the most difficult and powerful day I've had in architecture," she said. "It was the best way to end my school career. If I could find a job that would bring me half as much fulfillment, that's what I'm seeking in my professional life."

If you have an opinion about the ideas expressed herein, please write to us. Send letters to Education, via ARCHITECTURAL RECORD, 1221 Avenue of the Americas, New York, N.Y., 10020-1095, fax 212-512-4256, or e-mail: rec@wmgw-hill.com
Mississippi State University School of Architecture

Lecture Series

FALL 1997 SEASON LINEUP

Mississippi AIA Awards
Friday at 7:00
September 26, Glass Hall, Starkville
Charles C. Barlow, Jr., Architect, Jackson, Mississippi

Mary Miss, Sculptor, New York City
Monday at 7:00
October 6, Glass Hall, Starkville

Leslie K. Weisman, Architect, New Jersey Institute of Technology
Monday at 7:00
November 3, Glass Hall, Starkville

Special Feature: Thursday at 7:00
Nov. 13, War Memorial Auditorium, Jackson

With Your Host:

John McRae
Mississippi Valley Gas Company
Southern Natural Gas Company
Texas Gas Transmission Corporation
ENTEX, A NorAm Energy Company
Koch Gateway Pipeline Company
Mississippi Natural Gas Association

Contestants are furnished with complete rules and must meet eligibility requirements to receive:

This series is presented in cooperation with the AIA of Mississippi and the Mississippi Valley Gas Company.

This event is sponsored by Mississippi State University and the School of Architecture.

Mississippi State University School of Architecture
APPENDIX F
MATERIALS FROM PILOT STUDIES
Description of settings and participants in pilot studies in pilot studies

<table>
<thead>
<tr>
<th>AMHERST SETTING</th>
<th>CARACAS SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amherst, Massachusetts, United States</td>
<td>Caracas, Distrito Federal, Venezuela</td>
</tr>
<tr>
<td>University of Massachusetts</td>
<td>Universidad Central de Venezuela</td>
</tr>
<tr>
<td>Department of Landscape Architecture and Regional Planning (LARP)</td>
<td>Facultad de Arquitectura y Urbanismo (FAU)</td>
</tr>
<tr>
<td>Landscape Architecture Program</td>
<td>Escuela de Arquitectura [School of Architecture]</td>
</tr>
<tr>
<td>163 Students</td>
<td>1200 Students</td>
</tr>
<tr>
<td>120 Undergraduates/ 43 Graduates</td>
<td>97 Ninth Semester Undergraduates</td>
</tr>
<tr>
<td>12 Professors (full time) + Adjunct Professors</td>
<td>260 Professors (mostly part time)</td>
</tr>
<tr>
<td></td>
<td>71 Design Studio Professors</td>
</tr>
<tr>
<td></td>
<td>13 female (18.3%) / 58 male (81.7%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AMHERST STUDY PARTICIPANTS</th>
<th>CARACAS STUDY PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PILOT I: Interviews</strong></td>
<td><strong>PILOT II: Surveys</strong></td>
</tr>
<tr>
<td>2 Graduate students (female)</td>
<td>41 Fifth year undergraduates</td>
</tr>
<tr>
<td><strong>PILOT II: Surveys</strong></td>
<td><strong>Focus group</strong></td>
</tr>
<tr>
<td>61 Students (33 graduate, 28 seniors)</td>
<td>26 female (63.4%)</td>
</tr>
<tr>
<td>23 female (38%)</td>
<td>15 male (36.6%)</td>
</tr>
<tr>
<td>38 male (62%)</td>
<td>9 female (22.5%)</td>
</tr>
<tr>
<td>2 Professors</td>
<td>31 male (77.5%)</td>
</tr>
<tr>
<td>0 female (0%)</td>
<td><strong>PILOT III: Interviews</strong></td>
</tr>
<tr>
<td>2 male (100%)</td>
<td>2 Graduate students</td>
</tr>
<tr>
<td><strong>Interviews</strong></td>
<td>(male and female)</td>
</tr>
<tr>
<td>3 Professors</td>
<td>2 female</td>
</tr>
<tr>
<td>1 female</td>
<td>3 male</td>
</tr>
<tr>
<td>2 male</td>
<td><strong>PILOT IV: Interviews</strong></td>
</tr>
<tr>
<td><strong>PILOT III: Interviews</strong></td>
<td>4 Seniors (3 female and 1 male)</td>
</tr>
</tbody>
</table>
A. THE STUDIO SYSTEM

Strong presence

STUDIO CULTURE CONTINUA

Weak presence

A. THE STUDIO SYSTEM

B. DESIGN STUDIO PROJECTS

C. STUDENTS' INTERACTIONS

1. Pedagogy
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

1. Socialization
2. Pedagogy
3. Knowledge / Philosophy

C. STUDENTS' INTERACTIONS

social architecture contextual design projects object-centered architecture architecture as a non-political art]

[5. Social Values]
[4. Design Topics]

[7. Relationships]
[6. Work Dynamics]

individual work

personal self-reliance

individual critique

DESIGN STUDIO EVENTS AND CRITICAL ISSUES

- curriculum
- academic presentations
- public presentations
- studio critiques
- desk critiques
- group critiques
- other critiques
- design issues

STUDIO CULTURE CONTINUA

strong presence

weak presence

DEPARTMENTS: deadlines

innovative
APPENDIX G
OTHER MATERIALS
<table>
<thead>
<tr>
<th>Domains</th>
<th>Absolute Knowing</th>
<th>Transitional Knowing</th>
<th>Independent Knowing</th>
<th>Contextual Knowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of learner</td>
<td>• Obtains knowledge from instructor</td>
<td>• Understands knowledge</td>
<td>• Thinks for self</td>
<td>• Exchanges and compares perspectives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Shares views with others</td>
<td>• Thinks through problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Creates own perspective</td>
<td>• Integrates and applies knowledge</td>
</tr>
<tr>
<td>Role of peers</td>
<td>• Share materials</td>
<td>• Provide active exchanges</td>
<td>• Shares views</td>
<td>• Enhance learning via quality contributions</td>
</tr>
<tr>
<td></td>
<td>• Explain what they have learned to each other</td>
<td></td>
<td>• Serve as a source of knowledge</td>
<td></td>
</tr>
<tr>
<td>Role of instructor</td>
<td>• Communicates knowledge appropriately</td>
<td>• Uses methods aimed at understanding</td>
<td>• Promotes independent thinking</td>
<td>• Promotes application of knowledge in context</td>
</tr>
<tr>
<td></td>
<td>• Ensures that students understand knowledge</td>
<td>• Employs methods that help apply knowledge</td>
<td>• Promotes exchange of opinions</td>
<td>• Promotes evaluative discussion of perspectives</td>
</tr>
<tr>
<td>Evaluation</td>
<td>• Provides vehicle to show instructor what was learned</td>
<td>• Measure students' understanding of the material</td>
<td>• Rewards independent thinking</td>
<td>• Student and teacher critique each other</td>
</tr>
<tr>
<td>Nature of knowledge</td>
<td>• Is certain or absolute</td>
<td>• Is partially certain and partially uncertain</td>
<td>• Is uncertain - everyone has own beliefs</td>
<td>• Accurately measures competence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Student and teacher work toward goal and measure progress</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Is contextual; judge on basis of evidence in context</td>
</tr>
</tbody>
</table>

## Seven facets of transformation from the perspective of faculty women

<table>
<thead>
<tr>
<th>Facets of Transformation</th>
<th>Boyer and Mitgang</th>
<th>Reich</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ideals of a liberal education</td>
<td>• A more liberal curriculum</td>
<td></td>
</tr>
<tr>
<td>2. Interdisciplinary connections</td>
<td>• A more flexible, integrated curriculum</td>
<td>• System thinking</td>
</tr>
<tr>
<td>3. Different modes of thought</td>
<td>• Discovery, application, and integration</td>
<td>• Experimentation</td>
</tr>
<tr>
<td>4. Beginning design</td>
<td></td>
<td>• Abstraction</td>
</tr>
<tr>
<td>5. Communicative design studios</td>
<td>• A communicative place</td>
<td></td>
</tr>
<tr>
<td>6. Collaboration</td>
<td></td>
<td>• Collaboration</td>
</tr>
<tr>
<td>7. Caring for students</td>
<td>• A caring place</td>
<td></td>
</tr>
</tbody>
</table>

BIBLIOGRAPHY


270


A MESSAGE FROM Urs P. Gauchat, Dean
School of Architecture

The practice of architecture unleashes creative talents to improve the quality of life for all. It is an intellectual adventure that combines inspiration, judgement and informed decision-making. The education of the architect involves a rigorous course of study that encourages each student to reach his or her full potential, to work at capacity, to find personal challenges, and to create the preconditions for life-long growth. At NJIT, the study of architecture takes place in a setting that is like an extended family—built upon direct and intensive contact of faculty and student and even more importantly, upon a spirit of collaboration and cooperation among students.

Because changes in our society tend to be reflected in buildings and structures, there is great reason to be optimistic about the future of architecture and building. Our society is constantly transforming itself, creating the need for new building typologies and for a reconstituted infrastructure. NJIT is committed to educating the professionals who will be directing, designing and reinventing the building processes of tomorrow.
Transferable Skills: The Complete Professional

As a profession, architecture is based on a set of values for which knowledge and skills in the humanities and sciences are the foundation. As such, the study of architecture provides a general education drawing upon courses offered throughout the university. Typically, a student will be asked to organize his or her experiences by studying the design of buildings; design requires the technical skills of the architect but also the general skills of organization and creative thinking and the concerns and values of our civilization expressed in art, literature and culture.

The education of the architect, therefore, teaches habits of mind and skills that are transferable to many human endeavors and provides the basis for many individual careers. The idea is to educate a complete professional who is competent in the field of architecture but who also sees the role of the profession within a total social, economic and technological context. The architect must be able to interact with and understand the needs of the client, constraints by local and other government agencies, the cultural milieu, and public reaction. In essence, architects tend to find solutions that encompass the problem statement but are not limited by it.

A National Leader in Computer Aided Design

Both students and faculty of the School of Architecture have been recognized for their leadership in the application of computer aided design (CAD). Student work produced in computer studios has been featured in national professional publications such as Progressive Architecture and Computer Graphics World. Major international CAD conferences—most notably ACADIA—are organized by NJIT faculty. NJIT’s outstanding reputation in CAD has earned the trust and respect of software manufacturing firms that rely on the expertise of NJIT’s Imaging Laboratory for beta-site testing of emerging CAD programs. Examples of CAD student work appear throughout this brochure.

Imaging Laboratory

Through the activities of the NJIT Imaging Laboratory, the potential impact of computer graphics and image processing capabilities on the processes and products of architectural design is explored. Changes in technology continually present architects and architecture students with new media and images—images that alter the way buildings are visualized, interpreted, and created. As a result, the traditional understanding of architecture—through the use of conventional plans, elevations, sections, perspectives, and physical models—has been enlarged to include dynamic systems for the simulations of movement through space and multiple vantage points in interactive color and texture models, the simulation of multiple types of lighting sources and conditions, the merging of photo-realistic images of context, and the introduction of time-dependent phenomena. The Imaging Lab provides students with an opportunity to be exposed to new and developing software such as AutoCAD, 3D Studio and MegaModel.
The School of Architecture uses the New York/New Jersey metropolitan area as a laboratory where students are encouraged to work with communities in solving real problems. Fostering an education that uses the region of which it is part heightens the student’s direct awareness of the real world in which he or she will practice. In a typical community project, a local organization presents students with an actual problem: How should an abandoned industrial site be redeveloped? How should a new cultural complex be designed? Where is the optimal location for a homeless shelter? Students develop solutions as part of their studio work and the organization uses the work to generate ideas for solving its building and design problems.

In addition to student ideas, area organizations call on NJIT faculty to design solutions for actual implementation. Sometimes an individual faculty member works with the organization and in some cases organizations sponsor competitions open to all faculty.

The Bachelor of Architecture
The basic professional degree program offered by the School of Architecture is a five-year Bachelor of Architecture. Receipt of the B.Arch. is the first step toward eventual licensure as a professional architect. The program focuses on the development of professional skills in design, architectural technology, business practice and architectural precedent and the development of an ability to think across boundaries—creating general competencies in problem solving, organization of complex processes and systems, judgement, creativity and risk taking.

The B.Arch. curriculum consists of a core of required coursework and upper division options that allow for specialization and choice. The three-year core is designed to create a level of skill and knowledge that will be the basis for further study and selections toward an individual career path. In the final two years, each student can choose courses that most reflect individual interests.

The curriculum emphasizes four main areas:

• Architectural technology such as structural design and construction
• The architectural profession with attention to client needs, the practice of architecture and ethics
• The ideas of architecture in history and criticism
• Direct experience in the design studio where students are assigned architectural problems to solve that might range from a small room to an entire city block or subdivision

More About the Design Studio
The studio is the place where the entire education and knowledge base is integrated. The educational format of the studio is a hands-on, direct and intensive interaction between student and teacher. In the studio, the student learns to control the process of creation and to methodically make inquiries and solve problems. Students acquire the means to integrate the many factors under consideration into a successful project and to present ideas to reviewers and other students.

Admission: Evidence of Creative Potential
Admission to the School of Architecture is highly selective. Experience shows that those students who have demonstrated solid academic achievement and have developed their artistic or creative potential have the best chance of success. Therefore, applicants to the School of Architecture are required to submit supplemental materials in addition to the standard NJIT application for admission. The supplemental materials can be either a creative portfolio (drawings, paintings, pottery, videos, photography, sculpture, collages, costumes, stage sets, models, graphics, jewelry, performing arts, science projects, etc.) or a written essay.

Licensing
Laining the Bachelor of Architecture from an accredited school of architecture is the first step toward professional licensing. Candidates intern for three years with a licensed architect prior to sitting for a state-sponsored, four-day licensing examination prepared by the National Council of Architectural Registration Boards.

Flexible Degree Options
The School of Architecture’s large size has enabled us to foster graduate programs that offer the student many options in the journey toward becoming a professional. For instance, numerous dual degree programs allow students to accelerate studies. Students can be admitted to dual degree programs concurrently with their admission to the School of Architecture. A student can continue towards a master’s level degree, either within the School of Architecture (Master of Architecture, Master in Infrastructure Planning) or master’s programs available through other schools within the university. Most popular among these is the Master of Science in Management. Considered in this way, the architectural education is a core that allows for individual direction according to a student’s interests and abilities.
NJIT Advantages

Excellence: Money Magazine has named NJIT the third best educational value of its kind after Cal Tech and Georgia Tech. U.S. News and World Report ranks NJIT in the same category as some of the most visible and best known universities in the country.

Education for Life: Because today’s marketplace demands broadly educated professionals with a firm foundation in technology, NJIT’s undergraduate programs prepare students for further study in a variety of fields, including science and engineering, management, environment, medicine and law. Undergraduate minors in fields such as applied mathematics, computer science, economics, physics and statistics can help broaden a student’s education. The university offers numerous double-degree programs and graduate and professional degrees.

Accelerated Graduate Professional Education: NJIT offers simultaneous dual-degree programs in engineering and management, professional technical communications and many other fields. The School of Architecture offers one of the most active in the nation.

Real Life Work Opportunities: NJIT is located at the epicenter of the nation’s most vibrant and active corporate environment. The headquarters and facilities of a large proportion of the leading companies of the world, including AT&T, Exxon, Merck, and Nabisco, are located nearby. This provides significant opportunities for cooperative education, internship, and part-time employment activities. NJIT’s cooperative education programs are among the most active in the nation.

Undergraduate Research Experiences: NJIT is one of only three designated research universities in the state of New Jersey. Close to $30 million is spent annually in research activities. Leading research centers at the university include the Center for Environmental Engineering and Science, the Center for Manufacturing Systems, and the Microelectronics Research Center. Undergraduate students have a unique opportunity to team up with faculty and graduate students in pursuing research in their particular area of interest.

Diverse Environment: NJIT’s student body reflects the community and world in which we live. Students live and learn with people from many different cultures and backgrounds—a distinct advantage for professionals who must operate in an increasingly diverse and global society.

Accreditation: NJIT is accredited by the Middle States Association of Colleges and Schools (MSCAS). The B.Arch. is accredited by the National Architectural Accrediting Board (NAAB).

Campus Life: About 1000 students live on campus in three modern, air conditioned residence halls. A fourth residence hall—Albert Dorman Honors College has emerged as a leader in technologically oriented honors education. The college offers its students unique opportunities for academic growth and a fine foundation for the pursuit of advanced studies. Intensive, personalized study, scholarships, and access to a specially equipped Honors Center are just some of the advantages enjoyed by honors scholars.

Scholarships: Competitive merit-based scholarship awards up to and including full tuition are available in limited quantities for outstanding students.
A Word About NJIT

Founded in 1881, NJIT is the New Jersey's public technological university. Situated on a 45-acre residential campus in the hub of the New York/New Jersey metropolitan area, NJIT contributes to the area's development and economic growth through its programs of instruction, research and public service. Total enrollment is nearly 8000, with an undergraduate population of about 5000. The university offers full-time and part-time undergraduate and graduate studies. The university's five academic units are: Newark College of Engineering, the School of Architecture, the College of Science and Liberal Arts, the School of Industrial Management and the Albert Dorman Honors College. NJIT regularly appears in national guides to leading schools and best educational values including U.S. News and World Report and Money Magazine, which in 1997 ranked NJIT third in the nation among science and technology schools.

To Learn More:
Inquiries about undergraduate programs in architecture should be addressed to:
Professor Michael Mostoller
Director, Undergraduate Program in Architecture
NJIT School of Architecture
University Heights
Newark, New Jersey 07102-1982
Voice: (201) 596-6370/3080
fax: (201) 596-8296
e-mail: dyer@admin.njit.edu

University Admissions:
Voice: (201) 596-3300 or toll-free in the continental U.S. (800) 925-NJIT
fax: (201) 596-3461
e-mail: admissions@njit.edu
NJIT on Internet: http://www.njit.edu/
Check out NJIT's on-line admissions application!

NJIT does not discriminate on the basis of sex, sexual orientation, race, color, handicap, national or ethnic origin, veteran's status or age in the administration of student programs. Facilities are accessible to the disabled.