Customization and Autonomy : Characteristics of the Ideal Design Studio Instructor in Design Education

Ji Young Cho

Assistant Professor, College of Architecture and Environmental Design, Kent State University, Kent, USA

Abstract Design studio is a unique type of course in architecture and interior design education, in which learning is based on student–instructor interaction and learning by doing; yet little research has been conducted on student perceptions of the ideal design studio instructor. The purpose of this paper was to identify characteristics of the ideal studio instructor from student perspectives. Three award-winning design studio instructors' studio activities were observed, and the three instructors and their 40 students were interviewed. As a result, characteristics in four categories were identified. The author argues that providing customized feedback and allowing student autonomy are the two distinct characteristics that students value in design studio as compared to students in other fields or type of courses. The findings provide valuable insights to design educators who would like to strengthen their teaching studios by listening to student voices.

Keywords: Design Education, Design Studio, Pedagogy, Studio Curriculum

1. INTRODUCTION

Design studio is a unique course format in art and design education where learning occurs based on student–instructor interaction and learning by doing. Students solve complex and open design tasks under the tutelage of an instructor who is usually an experienced practitioner (Austerlitz, Aravot, and Ben-Ze'ev, 2002). Design studio is also considered the core of architectural and interior design education and an important course in the pursuit of a professional degree because it models actual professional design practice and represents the largest number of credit hours of coursework in the program (Anthony, 1999; Bunch, 1993; Cuff, 1992).

Different from the lecture class, in which the student's goal is likely to accept knowledge that the instructor transfers through concrete instruction, design studio centers on students' active learning and hands-on activities (Wilson and Jennings, 2000). In the studio student learning depends neither on textbooks nor concrete instruction, and neither exams nor tests typically measure student learning outcomes. Instead, the quality of

students' design demonstrates learning outcomes. For example, a criterion for accreditation of an architecture or interior design program is the evaluation of learning outcomes of student studio projects. Teams of expert evaluators from accreditation boards in North America, such as the National Architectural Accrediting Board for architecture programs and the Council for Interior Design Accreditation for interior design programs, visit schools and evaluate student work according to clearly defined criteria.

In any type of education, the learner's role is important in acquiring information (Ormrod, 2004), but the instructor's role in design studio is highly significant because primary knowledge is delivered through student-teacher interaction surrounding the students' design processes (Anthony, 1991); and one-on-one discussion is "particularly contingent on [the] teacher's pedagogical skills" (Goldschmidt, Hochman, and Dafni, 2010, p. 286). Student-teacher interaction is a rich source of knowledge (Goldschmidt et al., 2010), and the design studio instructor acts as a tutor, studio master, coach, judge, juror, and role model (Austerlitz et al., 2002; Anthony, 1991; Cuff, 1992; Goldschmidt et al., 2010; Schön, 1987).

In spite of the significance of the design studio instructor's role in design education, little research has been produced on students' perceptions of the ideal design studio instructor in architecture or interior design education. Although the opinions of students may differ according to their school experience or individual styles and educators do not have to depend only on student opinion, student voices are important resources because they can reveal expectations; and if students offer any common responses, they can motivate design educators to reflect on their own teaching.

Thus, the purpose of this paper was to extract the characteristics of the ideal design studio instructor from student responses. The term characteristic was used in a broad sense and includes personality, teaching method, teaching behaviors, and skills. The

Corresponding Author : Ji Young Cho, Assistant Professor
  College of Architecture and Environmental Design,
  Kent State University, Kent, USA
  Tel : + 1-330-672-9720 e-mail : jcho4@kent.edu

term ideal was defined as "a standard of excellence" (Online Webster Dictionary, 2011). Thus in the current research, the characteristics of the ideal design studio instructor means "those whom students want to encounter in their own studio because of the excellent teaching the instructor provides." By observing three award-winning design studio instructors and interviewing them and their 40 students, the author discovered the characteristics of the ideal design studio instructor.

2. BACKGROUND

2.1 Lack of Discussion of Traits of Design Studio Instructors

A review of the literature showed a lack of scholarly reports on studio instruction and teachers in architecture and the interior design field, which many researchers have pointed out (Attoe and Mugerauer, 1991; Cennamo and Brandt, 2012; Grasha, 1996; Moore, 2001; Ochsner, 2000; Schön, 1984, 1987). Studies of design studios have tended to be more about design projects or the design process instead of instructors and the student-instructor relationship (Austerlitz et al., 2002).

Design studio instructors tend to begin their teaching careers without training or preparation in teaching, relying primarily on intuition or their own experience as students (Attoe and Mugerauer, 1991; Oschner 2000). Even though instructors engage in some preparation, such as working as a teaching assistant or training through faculty support centers in higher education, such training is directed more toward lecture classes than the artistry-based design studio. In addition, studios are often taught by practicing architects and interior designers without formal training in teaching. In a study of the pedagogy of architecture education, Moore (2001) argued that "faculty . . . are most likely to respond that they teach in the manner in which they were taught—a self-perpetuating proposition" (p. 60). Grasha (1996) pointed out that most teachers start teaching "without mentors or clear direction, obliged to transmit knowledge and skills as best . . . [they] could" (p. 250). Cennamo and Brandt (2012) noted that "little attention has been paid to student and teacher participation structures through which design knowledge is co-produced among instructors and students within the studio" (p. 839).

The lack of discussion of instructors may result from the complexity and the difficulty of studying teachers' pedagogy and behavior. The study of instructors requires the researcher's long-term involvement in their teaching contexts to identify teaching philosophy, teaching methods, and styles. It also necessitates acquiring data from student interviews to understand students' experiences with the teacher's methods.

Another possible reason is that discussions about instructors sound somewhat haughty and challenge their authority in the design discipline (Goldschmidt et al., 2010; Grasha, 1996). Rooted in medieval apprenticeship and vocational training, the culture of the design studio originated in the French École des Beaux-Arts, where young architects were apprenticed by the atelier master, who was a practitioner as well as its patron and leader (Carlhian, 1979; Weatherhead, 1941). The instructor-student relationship in the atelier was like that of the apprentice-master, and masters had absolute authority in design. This tradition continues to influence contemporary architectural education (Boyer and Mitgang, 1996).

2.2 Design Review Process and Instructor's Role in the Design Studio

Design studio instructors provide each student with criticism, a private tutorial fit to the individual student's stage of development in design. Face-to-face criticism given at a student's desk is referred to as a desk critique, through which knowledge is delivered and co-created (Cennamo and Brandt, 2012). Design critique is "the combination of criticism and intimacy" (Austerlitz et al., 2002, p. 107) and stimulates "students' reflection on and discovery of their developing design knowledge" (Cennamo and Brandt, p. 842). Design studio is also a place where students learn new skills, graphic and verbal language, and ways of architectural thinking (Ledewitz, 1985).

Design projects are usually open-ended and ill-structured, and students are sometimes encouraged to solve complex problem beyond their own skill set (Little and Cardenas, 2001). Design projects evolve through multiple iterations with the encouragement of instructors (Little and Cardenas, 2001). Thus the ability to create an environment where active interaction takes place is significant for student learning in studio (Ochsner, 2000; Schön, 1987). Outstanding practitioners are not said to have more professional knowledge than others but more 'wisdom,' 'talent,' 'intuition,' and 'artistry'" (Schön ,1987, p. 13).

With regard to the traditional perspective of the studio instructor as master, an alternate and more current perspective is that of the studio instructor as coach or facilitator (Goldschmidt et al., 2010; Moore, 2001; Schön, 1987). Schön (1987) argued that architecture education is a branch of professional education that differs from other disciplines based on "technical rationality," which is an epistemology of practice derived from positive philosophy, in which professional practice is considered an application of technical, testable, objective, and cumulative knowledge (Parton, 2000). According to Schön, however, such a model cannot capture how real practice works, how the design problem is framed, and how knowledge is generated in real professional practice. A real design problem is messy and indeterminate; knowledge in practice is tacit and implicit, and it does not derive from rigorous research-based science but from a dialogue about the situation (Parton, 2000). Schön argued that education in a professional school is a matter of "learn[ing] to make or perform," and its goal is to acquire artistry through "practice and coaching" (1984, p. 2). An architecture studio should be an example of education for artistry. He also asserted that emphasizing technical rationality in professional education decreased the tendency to educate students of artistry and increased the tendency to educate them as technicians.

Moore (2001) created four metaphors for architecture professors as teachers—the scientist, the practitioner, the cleric, and the social activist—based on two criteria: the type of knowledge transacted and the character of the teacher-student interactions. The types of knowledge transacted in those interactions are expert and personal. Expert knowledge is delivered to and gained by students, and personal knowledge extends beyond the describable and speakable to how one should act and think. The character of teacher-student interactions falls into two categories: formal style and facilitator style. Formal style refers to interaction during which a teacher passes wisdom to students; facilitator style refers to interaction during which a teacher delivers learning skills and both students and teacher construct learning together (Moore, 2001).

Moore (2001) also argued that the traditional pedagogy of design studio naturally accommodates the cleric, who imparts personal knowledge and engages in formal student–teacher interaction in a manner that resembled master–apprentice interaction. He proposed, however, that the practitioner, who imparts personal knowledge and facilitates interaction emphasizing "dialogical interaction between teacher and student" (p. 68) is more desirable for design studio pedagogy.

Goldschmidt (2002) proposed three typical profiles of design teachers: instructor as (a) source of expertise or authority, (b) coach or facilitator, and (c) buddy. Instructor as source of expertise or authority is a model in which the instructor transfers knowledge and know-how to students, who extract knowledge from the instructor; instructor as coach or facilitator is a model in which the instructor guides and coaches students to develop and maximize student potential, and instructor as buddy is a model in which the instructor and students enjoy equal relationships and the instructor encourages students to join the professional community and culture through the socialization process (Goldschmidt et al., 2010). In a study of three different profiles of studio instructors' dialogue with students, Goldschmidt et al. (2010) found that the instructor as source of expertise or authority was most assertive in discussions, but the instructor as coach contributed to the majority of the discussion in a way that allowed students to consider the two of them equally important partners, which the researchers concluded is the most fruitful strategy. These studies demonstrate the importance of student-instructor interaction and the instructor's role in constructing learning.

3. RESEARCH METHOD

Participants in this study were three award-winning design studio instructors and their 40 students at three different Midwestern universities in the US. The three instructors were selected from recommendations made by each school chair or associate dean, who identified them as outstanding educators among teaching award(s) recipients at their respective universities. Primary data were obtained from student interviews and observations of the three design studios (Studio A, B, C). Two student interviews were conducted: one in the middle of semester and the other at the end of semester before final grades were issued. Observations of each studio were regularly conducted once a week for one academic semester. Through informal teacher interviews, the rationale for using specific teaching strategies was obtained.

Senior undergraduates in an interior design/prearchitecture program were enrolled in Studio A, where their project was to design a chapel. Graduate architecture students at a private university were enrolled in the elective Studio B, where their project was to design a Montessori school. Graduate architecture students at a public university enrolled in Studio C, their first core course, where their project was to design a car exhibition gallery. The instructors in all three of these courses had at least 10 years of teaching and practice at the time of the observations.

Observations were conducted to identify student-instructor interaction, common teaching strategies, instructional qualities, and students' design evolution. The other reason for observations was to improve understanding of the specific context and situations that students described in the interview process. Student-instructor discussions and student interviews were audio recorded with the permission of participants.

Student interviews were conducted individually, and each took 20 minutes. Students were asked about their opinions in following three areas: (a) the three best features of their instructor; (b) three shortcomings of their instructor; and (c) three features of the ideal design studio instructor. At the end of semester, these questions were asked again. Changes took place between the first and second interviews, and differences emerged. Some items mentioned as best features in the first interview were listed as the least favorite at the end of semester. Apparently, students realized that some features listed as favorite did not work for them in the long term. Because student opinions after an entire semester's experience better represented their attitudes, data from the second interview were used for analysis. In addition, students listed more least favorite features at the end of semester. Some students listed only two characteristics instead of three, so the total number of the responses did not equal three times of the total number of students.

Student responses and data from observations were transcribed and coded following the content analysis method, which entails identifying themes and patterns (Bloomberg and Volpe 2008). Coding is defined as "the process of organizing the materials into 'chunks' before bringing meaning to those 'chunks'" (Rossman and Rallis as cited in Creswell, 2003, p. 192). Because no defined or developed characteristics of the ideal instructor have been recorded in design studio literature, the author took an inductive approach to data analysis. Through the process of coding observation and interview data, the frequency of students' responses and teachers' studio behaviors were counted and compared, and common themes were identified.

4. FINDINGS

4.1 Four Categories of Student Responses

Regarding the qualities of the ideal or excellent teacher, no consensus appears in the literature (Grasha, 1996); however, good teaching manifests itself in multiple ways, and certain core attitudes and behaviors exist (Das, El-Sabban, and Bener, 1996; Helterbran, 2006).

Through the inductive coding of student responses, four themes surrounding the characteristics of the ideal design studio instructors emerged: (a) interpersonal attitude, (b) communication and manner of delivery of knowledge, (c) teaching strategies for design development, and (d) knowledge of subject matter. These four dimensions are not mutually exclusive because of the overlapping nature of teaching.

The category and nomenclature of these dimensions were reviewed and revised based on the literature review, which showed that diverse dimensions were used in identifying the elements of ideal, excellent, or effective teaching. In the literature on ideal teachers, the terms ideal, effective, excellent, or good modified the word teacher together or often interchangeably (Das et al., 1996; Pozo-Munoz, Rebolloso-Pacheco, and Fernandez-Ramirez, 2000). For example, according to Pozo-Munoz et al. (2000), the characteristics students associate with the ideal teacher should have related to "teaching competency" and "the relationship between teacher and student" (pp. 256-257), which were similarly found with regard to teacher effectiveness as well. The dimensions of the

ideal or effective teacher in the literature basically grouped into teacher personality, manner of delivery/course structure, teaching methods and behaviors, and knowledge (see Table 1).

Table 1. Comparison of Dimensions of Ideal Teacher or Effective Teacher

Researcher	Topic	Dimensions	Comparison with the dimensions in the current research findings
Jacobson, 1966	Effective behavior of teacher	Interpersonal relationships Availability to students Personal characteristics Teaching practices Evaluation practices Professional competence	A A A C C C
Grasha, 1996	Teaching style	Personal traits Teacher's role Classroom behavior Characteristics Teaching methods	A B C C C
Das, El-Sabban, and Bener, 1996	Characteristics of an ideal teacher	Personal qualities Teaching qualities Professional qualities	A C C
Harris, 1998	Effective teaching	Personality Teaching behavior in classroom	A C
Helterbran, 2006	Effective instructor practices, attitudes, and skills	Personal qualities of the professor Professional/instructional qualities Knowledge and presentation	A C D, B
Stronge, Ward, and Grant, 2011	Teacher effectiveness	Personal qualities Instructional delivery Learning environment Student assessment	A B B C

Note: A, B, C, D denotes the following dimensions respectively: A-personality; B-manner of delivery/course structure; C-teaching methods and behaviors; D-knowledge

Interpersonal attitude refers to the instructor's attitudes toward students and her or his personality as shown through attitudes, such as willingness to help students, approachability, and encouragement. Communication and manner of delivery of knowledge refers to the way the instructors communicate with students during class and the way they structure courses. Teaching strategies for design development refers to pedagogical techniques that instructors use to facilitate students' design capabilities. The knowledge of subject matter refers to the body of knowledge that the studio instructors possess and deliver.

4.2 Best Features of the Three Instructors

Regarding the three best features of their instructor, students offered diverse responses, but commonalities emerged among them. The 40 students listed 93 items total, and many of them overlapped. Table 2 presents a summary of best features of students' instructors, examples of corresponding responses, and frequency of responses.

Table 2. Summary of Best Features of Students' Instructors

Features Dimensions	Features	Examples of student responses	Frequency
Interpersonal attitudes	Is available, approachable, easy to talk to, engaging, willing to help	"He is easy to talk to in desk crit. He never tells you that you should not do this, which I appreciate. A lot of other professors do not respond to you enough, but he really tries to do as much as he can."	11
	Has a good personality (kind, patient, comprehensive, thorough)	"His understanding and comprehensive personality [is the best feature]. He tries very hard to understand students' point of views when individuals encounter whether personal problem or problem with the studio project. And he is very encouraging, and it made me want to do better in everything."	8
	Encourages/ motivates	"He was not only the best professor that I have ever met, but always listens to my problems and try to help me stay strong and positive. He never loses confidence in students and always brought me up when I started to doubt myself."	5
	Is prepared	"The way he is prepared"	1
	Is passionate, enthusiastic	"His passion for architecture"	1
	Is intimate and friendly	"He is intimidating and at the same time very friendly."	1
Communication and manner of delivery of knowledge	Is open and flexible (fosters autonomy)	"He is extremely open to any of your ideas because he ultimately say you are designing it not him."	10
	Communicates clearly	"Easy to understand what he wanted"	4
	Articulates well	"He articulates his thoughts amazingly."	2
Teaching strategies for design development	Challenges students to expand ideas	"Challenges students to expand and develop initial idea"	8
	Helps students to develop ideas	"Give direction without making the student do the teacher's design"	5
	Offers constructive criticism	"I like his way to give criticism. He never said 'This is wrong'; he pointed you in the right direction, saying, 'Look at this.'"	5
	Offers rich references, suggestions	"He made solid suggestions on developing the architectural aspects of my design work."	5
	Emphasizes issues that match students' interest	"I like how he paid attention to detail."	3
	Offers frank opinions	"He is not afraid to tell you it's good or bad."	3
	Uses pin-ups	"I like the pinups since I can see everybody's work."	3
	Perceives students weakness in design process	"He has good intuitive sense on when an idea is not working."	2
Knowledge of subject matter	Possesses sufficient knowledge, experience	"He has an incredible body of knowledge. He has seen so much work that he can tell you 'this architect did this, try to solve this problem' and show a bunch of ways in which you can try to solve a problem because he just knows so much."	16
Total count			93

Note: Students comments were reproduced in the students' own words.

First, in terms of interpersonal attitudes, the most common responses were as follows: available, approachable, easy to talk to, engaging, and willing to help. A good personality, supported by adjectives such as kind, comprehensive, patient, and thorough, was next; the ability to encourage and motivate ranked third. Students mentioned the instructor's availability when they needed advice and the ease with which they could talk to him or her as the best features of their instructors.

Second, regarding communication and the manner in which knowledge was delivered, conspicuously the top ranked was not being too specific and maintaining an open and flexible classroom environment. Students apparently preferred flexible design studio environments instead of prescriptive and overly structured ones. The ability to communicate clearly and articulate well were next.

Third, regarding teaching strategies for design development, the most common answer was that the instructor challenges students to expand ideas. Next were helping students develop their own ideas, offering constructive criticism, providing rich references and suggestions, and emphasizing specific topics or issues in which students are interested (e.g., physical model, detail, light, material, or interior space). All of these related to providing feedback coinciding with students' interest and ideas. In other words, they considered feedback customized to their own interest important and the ability to provide it as a good feature.

Fourth, in terms of knowledge of subject matter, students responded that rich knowledge and experience were good features of their instructor.

4.3 Least Favorite Features of the Three Instructors

In terms of the least favorite features of their instructors, students offered diverse responses; but some commonalities emerged. In total, 51 items were listed, and some of them overlapped. In the interview students were asked to list three least favorite features, but most students listed either one or two instead of three (see Table 3).

First, in terms of the interpersonal attitudes, talking too much, failing to listen to students, and changing his or her mind easily were the most common answers. The next was creating an intimidating environment and lack of availability.

Second, regarding communication and the manner of delivery of knowledge, students listed the instructor's per-sistence in his or her ideas and in prescribing and restricting the course environment. Confusing and vague commu-nication was next.

Third, regarding teaching strategies for design develop-ment, conspicuously top ranked was lack of feedback customized to student interest, which means that the instructor provided similar feedback to all students instead of comments customized to each individual. This tendency shows how much students valued an instructor's ability to provide feedback tailored to their interests.

Fourth, in terms of knowledge of subject matter, lack of knowledge of technology was the most common response.

4.4 Characteristics of the Ideal Design Studio Instructor

The last question dealt with characteristics of the ideal design studio instructor students want to have in the future. A total of 76 items were listed (see Table 4). Overall the list resembled that of the good features of their own studio instructor in Table 2. Apparently, students' experiences with their instructor influenced their perceptions of the ideal design studio instructor.

Table 3. Least Favorite Features of Students' Instructors

Features Dimensions	Features	Student response examples	Frequency
Interpersonal attitudes	Talks too much	"I forget what he was originally talking about because he talks too much or gives too much, so I forget what the real critic was for today. I lose the essence."	3
	Does not listen	"A couple of times I wonder whether he really listens to mine since there is so much going on in his head, but sometimes I think he is distracted and talks about similar things for a long time."	3
	Changes mind easily	"He said one thing one day and completely changed his mind the next; this made things hard."	3
	Is intimidating	"Sometimes he is very intimidating"	2
	Is not available/ too busy	"Towards the end of the semester he was often out of town."	2
	Is moody	"He gets moody too easily, and sometimes him being moody affects atmosphere in studio"	1
	Talks about others' faults	"Sometimes he likes to find and talk fault with student to other students"	1
	Regards students as novice	"Sometimes he overlooks the fact that we are students who try to learn."	1
	Fails to encourage	"I think he could benefit from being more encouraging of student development while still telling them areas in which they can improve."	1
	Lacks sense of humor	"He never does joking."	1
Communication and manner of delivery of knowledge	Prescribes and restricts	"Sometimes he tries to prescribe design ideas too much, and it is too transparent what he likes." "I wish he let the individual project develop itself with less restricted and preconceived ideas. There was a tendency for all the studio projects to be similarly prescribed in regard to certain elements, such as site strategy, basic organization, and the massive roof presence."	6
	Is confusing and vague	"Sometimes it is vague in what he is looking for. I guess specifically in a certain project, it's hard to tell what exactly he is looking for."	4
Teaching strategies for design development	Lacks ability to provide customized feedback geared to student interest	"Not interested in overall design concepts" "He tells each student similar ideas that led the students to have similar diagrams." "There were some concepts that I wanted to explore which he offered no advice about."	16
	Insists on a big printout	"His insistence on the big printouts every class"	2
	Conducts class at a rate that is too loose or too fast	"He is slow in criticism."	2
Knowledge of subject matter	Lacks knowledge of technology	"He is unable to assist with new technology."	3
Total count			51

Table 4. Features of the Ideal Design Studio Instructor

Features		Student response examples	Frequency
Dimensions	Features		
Interpersonal attitudes	Has a good personality (kind, honest, patient, positive, comprehensive, thorough)	"Sincerity; always want[s] to improve their students and help them become better designers"	7
	Encourages, motivates	"A good instructor will be able to encourage a student who has a poor design and instruct him or her about how to develop it into a great design."	6
	Is a good listener	"One who listens and tries to understand students"	5
	Is available, easy to talk, willing to help and motivates	"One who is willing to talk about your project you haven't thought yet"	5
	Is passionate, enthusiastic	"Their enthusiasm in the project"	2
Communication and manner of delivery of knowledge	Communicates clearly	"Good at sharing knowledge"	4
	Is open and flexible (allowing autonomy)	"A person that can allow a student's strengths to come through in the design and not overpower with their own ideas"	3
	Articulates clearly	"The ability to describe space"	2
	Knows when to encourage	"Knows when to encourage and when to discourage an idea"	1
Teaching strategies for design development	Helps students develop their own ideas (Provides customized feedback)	"Allow people to take their own path on their project but yet give guidance when they need it" "Ability to drive the students without pushing them into" "Helping you figure out how to put your design and to production taking from your head"	10
	Offers constructive criticism	"Give constructive feedback" "Teaches us how and the details of why instead of just telling us to do something "	7
	Challenges, encourages thinking outside the box	"And give me out of box"	5
	Offers rich references, suggestions	"Showing students lots of information"	4
	Exposes students to new ideas	"Introduce us to new ideas, techniques and designers"	3
	Has real world experience	"Real world experience to guide and prepare students life as architect"	2
	Lacks expectations	"Not high expectation"	1
	Has high expectations	"He lets you know what he expects and when things do not meet his expectation. He instills a type of fear in students because he expects the best from us"	1
	Employs hands-on methods	"Hands-on"	1
	Uses pin-ups	"With pinups, we can see everyone's collective ideas. That's really helpful, I think"	1
Knowledge of subject matter	Possesses sufficient knowledge, experience Is versatile in old, new media	"Knowledge of all aspects of architecture, including construction" "Well-versed in all new and old medias"	6
Total count			76

First, regarding interpersonal abilities, students most often identified a good personality as a feature of the ideal design studio instructor. Offering encouragement and motivation, listening, and being available, willing to talk, and helping and pushing students were cited next.

Second, regarding communication and the manner of delivery of knowledge, students listed clear communication as an important feature of the ideal design studio instructor. The next was the ability to create an open and flexible environment that allows student autonomy in the studio. Ability to articulate was cited next.

Third, in terms of teaching strategies for design development, the prominent answer was the ability to help students develop their own ideas. Next were providing constructive criticism, challenging students to think outside the box, and offering rich references and suggestions. These are all related to providing customized feedback and diverse options. Students showed that they want a teacher who can help them develop their own ideas, not the teacher's ideas. They said they want to be challenged to think outside the box through exposure to new ideas, but they also want to develop their own ideas instead of facing new ideas at each meeting.

Fourth, regarding knowledge of subject matter, students want to be taught by someone who has a thorough knowledge of the field as well as rich experience upon which to base feedback and suggestions.

4.5 Common Teaching Methods among the Three Instructors

The three observed studios varied in terms of the nature of the project and the students' academic status. In Studio A undergraduate senior studio students designed a chapel, in Studio B graduate students designed a school in an elective studio course, and in Studio C graduate students designed a car exhibition space in their first studio course. Nevertheless, two common themes emerged through observations: (a) use of precedents and having hero architects and (b) good verbal and visual articulation.

First, the three instructors actively used precedents, such as examples of architecture, architects, artwork, and theories to guide students' design evolution. The stages at which the precedents were introduced ranged from design inspiration development to presentation stages. The instructor in Studio A showed rich examples of architects' work to improve students' design and presentation skills, but they were customized for each student instead of showing the same works to all students. He frequently referred to the works of a number of architects, including Louis Kahn, Steven Holl, Renzo Piano, Alvar Aalto, and Tadao Ando. He defined those architects as hero architects whom he admired.

The instructor in Studio B used precedents from images and drawings of architecture, artwork, and readings about architectural and art theories. He suggested different artwork to each student as an inspiration for ordering principles for their design and asked

them to read the philosophy of Montessori education so that they could apply the principles to their school design. The main architecture precedents were the works of Herman Hertzberger, Aldo Van Eyke, Frank Lloyd Wright, and Louis Kahn.

The main source of precedents for Studio C was the work of architect Louis Kahn. The instructor used Louis Kahn's Kimbell Art Museum as a precedent to study architectural vocabulary and language as well as photography and model-making skills. The purpose of the project was to design a car exhibition space using the principle of the Kimbell Art Museum. The instructor said he believed students learn by studying precedent architecture.

Second, articulation is the other common strategy used by the instructors to assist students in developing designs. Students have limited understanding of architecture compared with their instructors, and they are relatively weaker in articulating their design intentions and ideas than instructors. The three instructors were proficient at perceiving each student's strengths, weaknesses, struggles, and difficulties, discerning the intentions of students even without their full description. Once they recognized students' design intention or impasse, they provided feedback and guidance with clear articulation to help them see where there ideas had stalled. Articulation coincides with the findings from the student interviews. Students considered articulation and clear communication as characteristics of the ideal design studio instructor. Schön (1987) asserted that a coach's artistry consists in his or her ability "to draw on an extensive repertoire of media, languages, and methods of description in order to represent his [or her] ideas in many different ways" (p. 297).

5. DISCUSSION

5.1 Prominent Characteristics of the Ideal Design Studio Instructor: Domain Specific or General?

In this research, four categories were generated inductively from student interviews; prominent characteristic in each category are summarized in Table 5. They are as follows: (a) good personality, encourager, and good listener, (b) ability to create an open environment allowing student autonomy and clear communication, (c) ability to provide sufficient customized feedback and challenging students, and (d) knowledge.

Table 5. Prominent Features of the Ideal Design Studio Instructor from the Study Findings

Dimensions	Features
Interpersonal attitudes	Good personality Encourager Good listener Availability
Communication and manner of delivery of knowledge	Communicates clearly and articulates well Creates an open environment allowing student autonomy
Teaching strategies for design development	Helps students develop their own ideas (Customizes feedback, give alternate idea)
	Offers constructive criticism Challenges thinking outside the box Provides rich references, suggestions
Knowledge of subject matter	Possesses sufficient knowledge

Are these characteristics then design discipline-specific or common across disciplines? In a study of student perceptions of ideal instructors of history, biology, or psychology in the US, Kusto, Afful, and Mattingly (2010) found that both general professorial traits as well as discipline-specific traits exist. Characteristics unique in design studio may reveal the nature of student-instructor relationships and pedagogy in design studio.

In a literature review on effective teaching, Harris (1998) found that continuous feedback and knowledge are two characteristics of effective teaching. Broder and Dorfman (1994) in a study of effective teachers in agricultural and applied economics at one university in the US found that effective teachers possess knowledge and the capacity to deliver it; in addition they are motivational, open-minded, willing to help, and easy to talk with. Das et al. (1996) in a study of ideal instructors in Spain by students from business, humanity, technology, law, and science found that willingness to help students, knowledge of subject-matter, ability to present information in a logical sequence and clear communication as traits listed by students. In a study of student perceptions of the teaching of sociology and social policy in one university in the UK, Forrester-Jones (2003) listed "approachability, enthusiasm, availability for discussion, and ability to build a good rapport" (p. 67) as traits of effective teachers. In a study of the mathematic classes in Belgium, Opdenakker and Van Damme (2006) found that concern for students, flexibility, and professional knowledge and experiences are important elements of teacher effectiveness. In addition, from a study of college student perceptions of teacher education in the US, Helterbran (2008) found four components contributing to good teaching: content knowledge, pedagogy skills, knowledge and appreciation of the multifaceted nature of students, and personal characteristics. The traits suggested in previous literature conducted in diverse geographic locations and disciplines show that good personality, approachability, clear communication, and knowledge align with the findings from the current study; but allowing autonomy and providing customized feedback were not included in such findings.

In the architecture field, among the scant research, Attoe and Mugerauer (1991) provided 14 traits of excellent design studio instructors from interviews with 20 award-winning architectural design studio teachers, who received teaching excellence award(s) from their universities (see Table 6). However, their findings were based on descriptions obtained only from teacher interviews so that they did not show how students experienced their traits.

Among the 14 traits, use of student interests to plan course content; fulfilling the role as coach, counsellor, and parent; and applying the Socratic method seem to coincide with allowing autonomy and providing customized feedback. The Socratic method involves one-on-one interaction in which teaching is done through questioning instead of exposition and lecture (Attoe and Mugerauer, 1991). Playing the role of coach, counsellor, and parent facilitates a teaching style characterized by discovery and exploration, not dictation and prescription. Use of student interests to plan course content demonstrates the teacher's willingness to acknowledge issues of concern to students.

Table 6. Fourteen Traits of Excellent Studio Teachers, adapted
from Attoe and Mugerauer, 1991, pp. 41-51

Three considerations	14 characteristics
The teacher as self	Has vitality
	Is genuine and energetic
	Believes that teaching is a mission
	Has a strong bond between teachers
Personal style	Teacher's personal interests and style match with the course
	Fulfills role as coach, counselor, and parent*
	Instills curiosity
	Applies the Socratic method*
Course format	Uses student interests to plan course content *
	Holds high expectations
	Drops students into the middle of problems
	Encourages collegiality among students
	Works hard in preparing course
	Has high standards

Note: *Traits that coincide with finding from the current research.

In summary, when comparing findings from the current study with those in previous literature—although a more thorough review is necessary—several characteristics exist across the disciplines: good personality, encourager, good listener; communicates clearly and articulates well; and knowledge of subject matter. Two other aspects appear prominently in the design studio: (a) ability to create open environment allowing student autonomy and (b) ability to provide sufficient customized feedback.

5.2 Autonomy and Customization:
Two Distinctive Aspects of a Design Studio Instructor

Then why are the abilities to allow autonomy and provide customized feedback distinct in design studio? These two characteristics were considered important by students for two possible reasons: (a) the uniqueness of the nature of the design problem, and (b) the uniqueness of nature of design knowledge.

First, design is an ill-defined and wicked problem-solving venture (Rittel and Webber, 1973) that does not lead to one single absolute answer. Well-defined problems are those whose solutions are already prescribed and can be solved with appropriate knowledge without further information; however, ill-defined problems are those in which the ends and the means are unknown and require a creative interpretation and approach (Rittel and Webber 1973). Uniqueness, uncertainty, and value conflict characterize each design situation, which lies in "indeterminate zones of practice" (Schön, 1987, p. 6).

Students also bring to design problem solving their own values and agendas—functional, environmental, psychological, social, cultural, and aesthetic aspects of architecture (Bhatia, 2006). By creating an open environment allowing autonomy, instructors acknowledge students' design intentions and values and let them develop their ideas; and students can approach the design practice creatively. Through customized feedback, instructors help students to develop their intentions and values in an architectural way.

Second, the nature of design knowledge is unique in design studio. Design knowledge that students learn from the studio instructor is not explicit but tacit and implicit (Polanyi, 1967). It is both positive and normative (Lang, 1987). It is artistry—"the kinds of professional competence practitioners display in unique, uncertain, and conflicted situations of practice" (Schön, 1987, p. 22). An instructor coaches a student "by reflecting on the student's action and by demonstrating new ways of thinking" (Austerlitz et al., 2002, p. 107), and students learn two dimensions from the instructor: substantive design skills and the competence of artistry.

Student interviews revealed that knowing students' interests and guiding them based on those interests are significant traits of the ideal design studio instructor. Student learning is successful when students' and masters' interaction results in what Schön (1984) called convergence of meaning. The master reads students' drawings and tries to match interventions with their understanding and problems; then students try to grasp the master's meaning and to test their new understandings by "translating them into a new performance" (Schön, 1984, p. 6). Ideal design studio instructors hold conversations and discussions until they attain a convergence in their understanding and agreement with the students through articulation and customized feedback. Design studio teachers are not only the media for the delivery of knowledge and experience, but also the media for learning artistry.

Students who came from majors other than architecture compared the professors in their previous majors with their current design studio instructors during interviews. A total of 14 students of the 40 came from different majors, including business, biology, or history. They cited differences in the level of interaction and personal contact, structure of the class, degree of communication, and frequency of presentation and review process. One student mentioned that customization and understanding students' personalities are unique among architecture faculty members:

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

Another student noted more interaction in design studios than in other types of classes: "It is completely different. Here [in architecture] we are working during the process together. I think my studio instructor is also a part of this project. Here, it is more interactive."

Still another contrasted the structured environment with the autonomous environment and thinking process, noting the difference: "In architecture, the way to work depends on you; it really depends on your level of excitement."

Students in the three studios commonly stated that having a good instructor greatly influenced their design development and evolution: One said, "The designer we become is from the knowledge and experience we take from our instructors."

Another stated, "The success of a student's work comes from the balance and good communication. It is difficult to proceed if the instructor is not completely on board with your ideas."

6. SUGGESTIONS AND IMPLICATIONS

6.1 Implications for Design Educators

Several suggestions for design educators emerged from this study. First, educators must find ways to facilitate student-instructor interaction and learning artistry. Educators should acknowledge that the pedagogy of design studio differs from that in other courses based on technical rationality and should question whether the traditional master-apprentice relationship is desirable or another pedagogy, such as coach or facilitator, would work better. Teachers sometimes create mystery-mastery in order to protect their authority and do not provide open instructional conversation (Schön, 1987). In the mystery-mastery situation the master (instructor) excessively obscures her or his message, resulting in students' lack of confidence and increased awe of the teacher (Goldschmidt et al., 2010). Studio instructors should provide valid information to students for informed decision making.

Second, with regard to the course plan and curriculum development, educators must consider the relationship between the degree of allowing autonomy and customized feedback and the level at which the students are enrolled. Beginning students tend to be more dependent; however, advanced students tend to have strong attachments to their projects and take ownership of them (Cho, 2011; Goldschmidt et al., 2010). For beginning students, providing coherent core experience with more structured classes may work better, but for advanced students allowing more autonomy and customization works better. Educators must also guide students to withhold their own prior knowledge, remain open to a trust relationship with their instructor, and listen to the teacher's suggestion with open minds for successful learning.

6.2 Limitations and Direction for Further Research

The current study was limited in two ways. First, the relationship between the level of enrollment and student perception of the ideal studio instructor was not analyzed. Thus, whether student perceptions are coherent or different across years of enrollment has not been determined. Second, because of the limited number of students from one geographic region, findings are not generalizable.

However, even though the culture and detailed structure of design studio may vary from school to school or country to country, its basic format is similar in that students solve design problems and their instructor gives feedback on the students' design solutions. No matter how the curriculum changes, the essential element of design studio is teacher-student interaction (Ku, 2013). Thus, the findings from this study will provide insights not only to educators who are in the similar geographic regions but also those who engage in design education as a whole.

The limitations in the current study naturally lead to directions for future research. Developing a questionnaire and conducting a quantitative survey with a larger number of participants with different culture and regions would help to identify whether allowing autonomy and providing customized feedback are the two distinct characteristics of the ideal design studio instructors compared to those in other fields. In addition, comparison of perceptions of beginning students and advanced students, of students and instructors, and of design majors and majors in other disciplines allow researchers to identify and develop more thorough design pedagogy.

No single best way or definite plan leads to becoming an ideal; however, identifying traits of ideal teachers is "a positive step toward strengthening teacher education and classroom practice" (Helterbran, 2006, p. 126). More research on this topic will benefit both educators and students reciprocally with the development of a sound pedagogy and an increase in effective learning in the design studio.

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