THE NEW STUDIO:
BREAKING A LONG TRADITION

Paul T. Skaggs, IDSA
Brigham Young University, Chair of the Industrial Design Program
paul_skaggs@byu.edu

INTRODUCTION
Termed “the classroom of the future” (Leiboff, 2010), the studio method of instruction is receiving attention in the academic media. It has also been implemented in the field. The National Science Foundation (NSF), for instance, is promoting studio-like instruction in engineering and the sciences (National Science Foundation, 1996). This new method of teaching necessitates new kinds of teaching spaces. For example, MIT’s new engineering building will have numerous configurable studio classrooms (MIT, 2012). Even though studio instruction is considered the future of education, design education has been using this method of instruction for nearly a decade. For this reason, members of the Industrial Design department at Brigham Young University (BYU) were asked to give a presentation on studio instruction and studio space to the Engineering faculty and subsequently to committee members of the Center for Creativity, Innovation, and Learning at BYU, both of which are exploring new kinds of teaching spaces.

The presentation, which focused on the basic principles of studio instruction and the kinds of teaching spaces it requires, generated a great deal of conversation about studio instruction and its associated settings, prompting us as faculty members in the Industrial Design department to reflect on our own studio experience. We realized that the way we look at studio space and studio instruction has changed over the last 10 years. Many of the principles that formed the core of studio space and instruction have evolved as the design profession, design methodologies, design students, and design tools and technologies have changed. The focus of the studio has moved from making things to making meaning. Based on the influence of these changes on our instruction and studio space, we realized it was time for us to move away from the workroom mentality of the traditional arts and crafts–based studio and toward the more current business model of the studio as a war room. This process required making decisions about what to keep, what to modify, and what to discard in the studio and what to focus on and what to deemphasize in the curriculum. This paper outlines the history, the basic principles, and the focus of studio instruction as well as our reasons for breaking with this long tradition and the ensuing results.

MEDIA ATTENTION
The academic attention generated by the studio method of instruction has made it popular in both K–12 and college environments. The studio method is based on the desire to move away from the traditional lecture-based pedagogy and toward a project-based pedagogy in which faculty members serve as mentors by providing projects, observing learning, answering questions, providing feedback, and listening and watching more than lecturing. Students work together to learn, and activities are structured to emphasize collaborative, active, student-based discovery (Leiboff, 2010). North Carolina State University, for example, has developed the
“Student-Centered Active Learning Environment with Upside-Down Pedagogies,” or SCALE-UP (the “upside-down pedagogy” refers to the reversal of Bloom’s taxonomy [Bloom, 1956]). SCALE-UP is a learning environment specifically created to facilitate active, collaborative learning in a studio-like setting. It has been adopted by more than 150 colleges across the United States and around the world, and some, including MIT, have adapted the program to fit their particular needs (SCALE-UP, 2013). The new engineering building at MIT, for example, has multiple studio-teaching classrooms based on what MIT calls “Technology Enhanced Active Learning,” or TEAL. As mentioned, the National Science Foundation (NSF) is also promoting studio teaching in engineering and the sciences. The NSF feels that studio teaching is consistent with the goals summarized in National Research Council reports, including the National Science Education Standards (1996). Another NSF report, Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology (National Science Foundation, 1996), also promotes studio-style learning. These reports emphasize the benefit of students becoming actively involved in science and thinking like scientists. In its executive summary, the NSF report recommends that “all students learn [science] by direct experience with the methods and processes of inquiry.” While doing, thinking, and inquiring, students learn science and also develop key skills, including collaboration, teamwork, communication, and responsibility (NSF, 1996).

INTEREST AT BYU
Current media attention has created a new awareness and interest in studio environments and instruction at BYU. The departments of Engineering, Instructional Psychology, Humanities, and Education have all expressed interest in incorporating studio instruction into their disciplines. The College of Engineering became interested while fundraising for a new building and creating plans for allocating learning spaces. This interest was created by the new MIT engineering building and its studio-instruction spaces.

STUDIO-BASED INSTRUCTION IN INDUSTRIAL DESIGN
Studio-based instruction has been a focal point of design education for over a century (Droste, 1990). It was adapted from the early training of artisans with the purpose of supporting and building real-world skills (Boyer, 1996). Today, most studio models in design education trace their roots to the approaches that were developed in the Bauhaus school under the direction of Walter Gropius and Johannes Itten, who promoted learning design by actually working on designs (Droste, 1990). As the Industrial Design department at BYU has been utilizing the studio method of teaching for more than 40 years, the Engineering department asked us to give a presentation to them on studio instruction and planning studio space.

PRESENTATION ON STUDIO INSTRUCTION
The presentation was made to the Engineering undergraduate committee with representatives from the following departments: Mechanical Engineering, Electrical and Computer Engineering, Civil and Environmental Engineering, and Chemical Engineering. Also included were representatives from the School of Technology, including Construction Management, Technology and Engineering Education, Information Technology, Manufacturing Engineering Technology, and Industrial Design. The presentation highlighted the history of lecture-
Studio-based instruction and how it became the prevalent method of education today—in essence, the lecture-based system was founded when the industry that education served focused on tactical skills. In our presentation, we indicated that the industry is changing and that education must be modified to meet its new requirements. According to Ken Robinson, author of *Out of Our Minds: Learning to Be Creative*, the method of education hasn’t changed as much as the industry has (2001).

As mentioned, we outlined the main components of studio instruction in our presentation:

**STUDIO INSTRUCTION FORMAT**

Studio-based instruction is more conducive to project work than it is to course work. Learning occurs in relation to the project and the students’ efforts to understand his or her own requirements for completing the project successfully, thus the students learn by doing. This project-based format allows for more trial and error because there is time to recover from mistakes or to change directions. This is determined by the length of time allowed for the completion of each project. Studio instruction generally focuses much more on the students thought process than on the implementation of a final idea. In the Industrial Design program our studio projects focus on seven different learning experiences: form plus the functional aspects of ergonomics and mechanisms; form plus meaning, context, and brand; design research methodologies; implementation strategies; structured creativity; user experience; and expression.

**ROLE OF THE STUDENT**

In large part, students are responsible for their own learning. Students are involved in finding, defining, and understanding the context and scope of the project. They are also involved in organizing and clarifying information into clear concise outcomes. Students determine what methods, tools, skills, and knowledge to apply to meet the specific project parameters. Students are also involved much more in managing their own time in that they have less frequent and specific due dates. Studios are highly collaborative rather than focused solely on the individual. For example, students’ studio work is made public to allow peers and mentors to participate in their thought process. Their work is critiqued by peers, professors, and outside experts. Students learn to accept these critiques as powerful tools that can help them define and refine their ideas. Studio instruction is also less formal, creating more comfort for students by allowing them to move around, talk, play, and interact.

**THE ROLE OF THE PROFESSOR**

The professor no longer professes but acts as a guide or mentor to students, focusing on helping them think, discover, and apply more than on simply disseminating information. The Mentor provides projects that will teach the desired learning outcomes for the course. This means that the Mentor has more contact hours with the students as he or she works to guide them in their thoughts and actions. Mentors need to be judicious with feedback to the students or the results become the mentors and not the students.
ADJUSTMENTS
Studio courses are usually smaller in size (fewer than 20 students), because of the requirement for the mentor to devote time for each student to review and critique their work in a class period. New methods of studio instruction have been developed for much larger class sizes for example if you are reviewing and critiquing a group not the individual a mentor can cover more students in the same period of time. Studio courses are also longer than typical lecture courses; usually, a studio class is 2–3 hours long and meets twice a week. Studio course projects are longer than typical classroom assignments. A studio project can last anywhere from three weeks to a semester long. In addition, because the project requirements vary with each class, the studio course spaces need to be flexible. Flexibility allows for change to meet the needs of each new project. While most universities would say they are student-centered, the classroom space is usually teaching-centered. In studio courses lecture is no longer the primary mode of instruction, which changes the idea of the professor at a podium augmented by technology. In the studio the technology can move into the background rather than be the focus of the space. Ideal studio space would encourage collaboration among students and mentors so the spaces need to be conducive to collaboration. It is not always feasible to have dedicated space for each class, so learning spaces should be flexible so that they can be reconfigured for different classes within a relatively short period of time (Oblinger, 2004). All furniture in the space is portable to allow the space to reconfigure easily. For example, in a recent project with Black Diamond, a manufacturer of high-end outdoor sports equipment, we needed to clear a space to set up tents in the studio. Size, time and space can enable or inhibit a student-centered approach to learning.

INFLUENCES ON CHANGE
As stated, preparing for this presentation and the conversation that ensued caused us to reflect on our own experience in the studio, how studio teaching has changed over the past 10 years, and what influenced these changes.

CHANGE IN BYU’S CULTURE
In 1998 the Industrial Design department at BYU moved from the College of Visual Arts to the School of Technology in the College of Engineering and Technology. This process prompted us to look at our philosophies, methods, and tools to try and determine what actual best practices or what was tradition from our visual arts past, and what the design program should and could look like in a college of engineering. We found that we were as out of place in the College of Engineering as we were in the College of Visual Arts. In the College of Visual Arts, we were the technologists; in the College of Engineering, we are the artists. We had to determine what was important for us to throw away, or to modify, or to keep in the program. Of course, the studio method of instruction was important to us, and we had to work hard to convince the college to give us studio spaces, which was interesting, in view of our recent discussions about the value of studio instruction and space in the college.
CHANGE IN THE DESIGN PROFESSION
As the focus of the design profession changes in the world, so does the focus of design education. The industrial design profession seems to be focusing less on tactical problem-solving skills and more on strategic problem-finding and problem-defining skills. Based on the idea of making human connections through creating aesthetics and solving problems, the focus has more and more moved to making meaning. Michael Winnick, head of business development at GravityTank, said, "With the increasing commoditization of the back end, low intellectual investment portion, a service that most OEMs in China can now offer as part of their service, industrial design firms need to restructure to focus more on the product definition end, the early research, the strategic design planning and platform innovation end of the development cycle in order to generate revenue and stay profitable" (Bhan, 2004).

In Redesigning American Business, Bruce Nussbaum underscores this shift: “Design in America isn’t about form but innovation, in the guise of new products and services.” With the design industry’s shift in core competencies from drawing to thinking, from styling to innovating, from shaping things to visualizing new paradigms, what are the opportunities for designers today? (2004).

CHANGE IN DESIGN METHODOLOGIES
These changes in the profession have introduced, and in some cases focused on, particular design methodologies, especially the more strategic front-end problem-finding and problem-defining skills. These methodologies require designers to get out of their spaces and observe, experience, and record people, activities, spaces, interactions, and objects as they relate to the problem at hand. As David Kelly said in the NBC Nightline report, The Deep Dive, “a designer sitting at his desk [or in the studio] is not getting the job done” (1999). With the focus having shifted to the “extreme empathy” or understanding side of design, designers are no longer working in the studio but are working in the field, observing, experiencing, and talking to people in their environments. As these strategy roles become more important than the tactical skills, the workroom becomes more of a war room, a place for designers to make their research visible so as to organize, simplify, and clarify data in order to discover compelling insights.

CHANGE IN STUDENTS
We have found that the dynamic of the group of students moving through our program makes a difference in the individual students learning. Their relationships with each other are not built through living together but through playing together. But where do they play? Outside. The students do not need to be collocated to be connecting and sharing. Technologies such as texts, e-mails, social networks, image-sharing sites, cell phones, etc., allow students to connect and share anywhere. Where are the students during class time? They are out doing design work. In the past, the students’ collaborative efforts were focused on other designers in the studio; now, collaboration is focused on other disciplines in other colleges and with people outside the university.

In the past, our students have worked in personal studio spaces. Each student took ownership of his or her space, what we called “nesting.” We provided a desk, a chair, storage, and a pin-up board for each student. Over the
years, students have begun carrying fewer personal tools. Now their tool kits are small enough that they can carry them with them, ready to design at any moment and in any space. This eliminated the need for personal storage in the studio. In addition, because the students work in teams, the personal tables have been replaced with large work tables. The small pin-up boards have been replaced with large magnetic white-board partitions. Very seldom do we see students pinning up multiples of their own individual research and concepts; rather, they pin up multiples of team research and concepts. This has also changed how we critique project work: we critique the team, not the individual students. We think this kind of team collaboration is significant because it more closely mirrors what the student's professional experience is likely to be.

**CHANGE IN TECHNOLOGIES**

In addition to the personal technologies that allow students to connect with each other, there is a variety of other technologies that allow us to produce models and prototypes faster and more efficiently. The tactical work of the not-too-distant past would be done at a desk—a place to think, sketch, model, and build product concepts. Now we sketch on Cintiq's and model in a computer lab. We build using laser cutters, CNC mills, and a variety of rapid-prototype technologies. At times, these technologies are shared resources and are not located within the design department.

**VALIDATION**

BYU hosts an annual two-day design symposium with speakers, workshops, and portfolio reviews. It allows us to receive feedback on our students' performance through comparison to their program peers and peers from other design programs. Paul Backett, industrial design director for Ziba, commented, "BYU continually impresses with solid, unflashy but well-considered design work that solves real problems and addresses human needs. They inspire an incredible level of user empathy; students here, more than almost any other school, are clearly not designing for themselves. The BYU work ethic is one of the strongest I've encountered, with students tenacious enough to make short work of obstacles that would completely frustrate the typical ID grad." (2011)

Kasey Jarvis, design director at Black Diamond (previously for General Motors and Nike), said, "I've been digging through resumes and portfolios for our open internship position . . . and I've been very impressed with the portfolios and resumes of the BYU students that have applied. I've received around 300 applicants for our internship position from all over the world, and the ID students from BYU are among the best."

The last industry sponsored project completed by the BYU ID program was with Black Diamond, a manufacturer of high-end outdoor sports equipment. The deliverables requested by Black Diamond were not product concepts in the traditional sense. Instead, they were looking for insights into their users and their primary marketing channel, REI. The students spent six weeks on research as teams and six weeks on implementing their insights—not an artifact but a compelling narrative. The students did not ignore the concept forms, but the real interest from the sponsor was the narrative—focusing on the strategic, not the tactical. At the project presentation at Black Diamond, Jeremy Saxton, lead designer, commented, "I was especially impressed with how much work the students put in . . . . The designs looked sharp and the explanations were clear and impactful. All present [the
presentation was given to Black Diamonds executive design team] were really excited by the fresh perspectives, and the students left a great impression.

When are 2\textsuperscript{nd} year ID students were asked about their first studio experience, they explained that it helped them “see things as they really are” (truth), and prompted them to “ask the right questions and dig and dig for answers.” They experienced the power of collaboration and learned that “different opinions are valuable.” They learned how to “accept critiques” and how to “be bold and confident in making judgments and decisions.” They learned how to “be creative within constraints” and how to “work through the invisible obstacles.” Considering these outcomes, it is clear that the studio experience will positively impact the students’ future employment.

**SUMMARY**

Because of long-standing traditions in design, some members of the Industrial Design faculty at BYU have struggled with some of these changes; however, the evolution of the culture, the design industry, the students, and the technologies have impelled us to consider the past and the future and to make changes that we feel will help our students in their future employment in the design industry. Some of the changes have been prototypes that we have visualized, validated, and continue to iterate. We will continue to explore how, what and where we teach. We are constantly asking ourselves what is up and what is down, what is in and what is out, what to save and what to delete.

**REFERENCES**


SCALE UP (2011) http://scaleup.ncsu.edu/