Interdisciplinary Practice in Industrial Design, Vol. 48, 2022, 64–72
https://doi.org/10.54941/ahfe1002017

The Studio as a Hub, Not a Home

Paul T. Skaggs[1,2]

[1]IDSA, Professor in the Industrial Design Program, Provo, UT 84602, USA
[2]Brigham Young University, Provo, UT 84602, USA

ABSTRACT

The studio method of instruction, termed "the classroom of the future," is receiving a great deal of attention in the academic media. MIT's new engineering building, for instance, will have numerous studio-instruction classrooms. The National Science Foundation is also promoting studio instruction in engineering and the sciences. Industrial Design has been using the studio method of instruction for more than 40 years it is even mandated by our accrediting body National Association of Schools of Art and Design (NASAD). Because of this long history Industrial Design was asked to give a presentation about studio instruction to the Engineering faculty at BYU. The presentation focused on the principles of the studio class and where it works well and where it may not. What faculty and students' responsibilities for a successful studio instruction? The interest and conversation that was generated from the presentation caused members of the Industrial Design faculty to reflect on our own history of studio instruction. Industrial design realized that the way we look at the studio experience has changed. Many of the principles that form the core of studio instruction have evolved as the design industry, design methods, students, and technologies have changed. As design educators we have experienced and struggled with these natural changes and how they have impacted studio classes and design students. As a result, we began to look at our methods to determine what the tradition from the arts and crafts past was and what is truly needed in design education today. Industrial Design had discovered that over time we had moved away from the student nesting workspace mentality of the traditional arts and crafts–based studio and toward the more current business model of the studio as a war room. The studio had moved away from a home to a hub for the students. This change has mirrored what is happening in the design industry as it has moved from focusing on tactical problem-solving skills to more strategic problem-finding and problem-defining skills. This paper outlines the history, basic principles, and focus of studio instruction and what has prompted the moving way from studio tradition.

Keywords: Studio teaching, Teaching spaces, Project based instruction, War room

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 industry. 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, 2005).

Even though studio instruction is considered the future of education, design education has been using this method for nearly a decade. For this reason, members of the Industrial Design program 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 program 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 of this break.

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, offering 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 created specifically to facilitate active, collaborative learning in a studio-like setting. This program 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, 2011). 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 NSF is also promoting studio teaching in engineering and the sciences. The NSF believes 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*, 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 (National Science Foundation, 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 in studio instruction while fundraising for a new building and creating plans for allocating learning spaces. This interest was generated by MIT's new 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 and Mitgang, 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 program 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-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 has not 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 coursework. Learning occurs in relation to the project and the students' efforts to understand the 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 learning from trial and error is determined by the length of time allowed for the completion of each project. Studio instruction generally focuses much more on the student's thought process than on the implementation of a final idea. In the Industrial Design program, our studio projects focus on seven 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 in studio-based instruction. 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 project parameters. Students are also much more involved in managing their own time because 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 the students' 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

In studio-based instruction, the professor no longer professes but acts as a guide or mentor to students, focusing more on helping them think, discover, and apply 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 while working 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) to allow the mentor time to review and critique students' work during each class period. New methods of studio instruction have been developed for much larger class sizes; for example, if the mentor is reviewing and critiquing a group, not an individual, they 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, often lasting anywhere from three weeks to a semester. In addition, because the project requirements vary with each class, the studio course spaces need to be flexible 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, a change that alters 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. An ideal studio space encourages collaboration among students and mentors, so the spaces need to be conducive to collaboration. Dedicating space for each class is not always feasible, so learning spaces should be flexible—able to be reconfigured for different classes within a relatively short period of time (Oblinger, 2004). All furniture in the space is portable to make reconfiguring the space easy. 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, our preparations for this presentation and the conversation that ensued caused us to reflect on our own experiences 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 program 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 were actual best practices and what were traditions from our visual arts past and what the design program should and could look like in an engineering college. 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, 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 space—an interesting paradox considering 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 moved increasingly 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 (2004) underscored 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?

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 ABC News *Nightline* report, "The Deep Dive," "A designer sitting at his desk [or in the studio] is not getting the job done" (qtd. in Koppel, 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 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 student's 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, and so forth 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 their space, a process we called "nesting." We provided a desk, a chair, storage, and a pin 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 change has 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 boards have been replaced with large magnetic whiteboard partitions. Very seldom do we see students pinning up multiple copies of their own individual research and concepts; rather, they pin up copies of team research and concepts. This focus on teams 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 students' professional experience is likely to be in the future.

CHANGE IN TECHNOLOGIES

In addition to the personal technologies that allow students to connect with each other, a variety of other technologies 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 tablets and model in a computer lab. We build using laser cutters, CNC mills, and a variety of rapid-prototyping 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. The event allows us to receive feedback on our students' overall performance through comparison to their program peers and peers from other design programs. Paul Backett (2011), 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.

Figure 1: Black Diamond studio research campout.

Kasey Jarvis, chief design officer at Under Armour (previously design director 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 Industrial Design program was with Black Diamond. The deliverables requested by Black Diamond were not product concepts in the traditional sense. Instead, the company was looking for insights into its users and its primary marketing channel, REI. The students, as teams, spent six weeks on research and six weeks on implementing their insights (Figure 1)—not an artifact but a compelling narrative. The students did not ignore the concept forms, but the sponsor's real interest was in the narrative—focusing on the strategic, not the tactical. At the project presentation at Black Diamond, Jeremy Saxton, the 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 Diamond's executive design team] were really excited by the fresh perspectives, and the students left a great impression.

When our 2nd-year Industrial Design students were asked about their first studio experience, they explained that it helped them "see things as they really are" (truth), and it 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." When we consider these outcomes, it is clear that the studio experience will positively influence 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 evolutions 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 coming employment in the design industry. Some of the changes have been prototypes that we have visualized, have 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

Backett, P. (2011) Designing the ideal industrial design program. Core77 Online Design Magazine Website: http://www.core77.com/blog/education

Bhan, N. (2004) While you were out: Changes in the global design industry. Core77 Online Design Magazine Website: http://www.core77.com/reactor/12.04_niti_bhan.asp

Bloom, B. S. (1956) Taxonomy of educational objectives: The classification of educational goals. White Plains, NY: Longman.

Boyer, E., Mitgang, L. D. (1996) Building community: A new future for architectural education and practice. Princeton, NJ: The Carnegie Foundation for the Advancement of Teaching.

Droste, M. (1990). Bauhaus. Bauhaus-archiv fur Gestaltung. Berlin, Germany.

Koppel, T. (Anchor), Kelly, D. (Guest). (1999) The deep dive *ABC News Nightline*. ABC Universal Media, LLC.

Leiboff, D. (2010) Studio classroom: Designing collaborative learning spaces. Campus Technology Digital Magazine Website: http://campustechnology.com/articles/2010/05/19/studio-classroom-designing-collaborative-learning-spaces.aspx

MIT. (2005) Technology-enabled active learning. MIT iCampus Website: https://icampus.mit.edu/projects/teal/

National Science Education Standards. (1996) National Academy of Sciences.

National Science Foundation. (1996) Shaping the future: New expectations for undergraduate education in science, mathematics, engineering, and technology (Report No. nsf96139). Washington, DC: National Science Foundation.

Nussbaum, B. (2004) Redesigning American business. Bloomberg Website: http://www.businessweek.com/stories/2004-11-28/redesigning-american-business

Oblinger, D. (2004) Leading the transition from classrooms to learning spaces. http://net.educause.edu/ir/library/pdf/EQM0512.pdf

Robinson, K. (2001) Out of our minds: Learning to be creative. Chichester, West Sussex, UK: Capstone.

SCALE-UP. (2011) http://go.nscu.edu/scaleup