‘Learn By Doing’

Experiences in order to be educative must lead out into an expanding world of subject-matter, a subject-matter of facts or information and of ideas. This condition is satisfied only as the educator views teaching and learning as a continuous process of reconstruction of experience. -John Dewey

In the early part of the twentieth century, Cal Poly, San Luis Obispo grew from a small technical /vocational school along a prominent railroad line connecting northern and southern California to a bona-fide university, fueled by oil resources and a ranch/farm culture. The progressive, John Dewey inspired ideology, that things are learned best in through action, with concern for context and with requisite reflection upon the experience, has been its pedagogical backbone and motto from the beginning. Today this pedagogy is the core of action learning, contains threads of constructivist thinking, and can be seen as one of the more positive forms of inductive learning.

In the 1960’s this ethic allowed the College of Architecture and Environmental Design to be given access to and management of a portion of ranch/canyon lands adjacent to the core campus, and the first of several full-scale student projects and experimental structures began construction. While financial challenges of building at that scale have made that tradition more sporadic, structures are still erected, adapted and restored. A student design-build competition, “Design Village” began its annual spring run in the 1970’s and continues today over a three day ‘Open House’ weekend and hosts thousands of visitors in addition to over two hundred competitors, so many students are aware of the tangible legacy before formally admitted to the program.

In 1999, fifth year architecture thesis professors were asked to engage the freshmen on design via a shop activity course. ARCH 105 became staffed by senior faculty who each brought their own form of assignment to the course. The course utilized a college sponsored and professionally staffed wood and metal shop. Portion of the earlier course continued: shop safety and demonstrations of equipment, and craft-oriented outcomes of three metal joints [spot weld, solder, pop rivet] and three wood joints [mortise and tenon, dovetail, tongue and groove] out of a small kit of common materials.

The Nomadic Companion

At that time there was a graphic communications course that taught 2D and 3D drawing as well as introducing design skills such as diagramming and clarity in graphics. The newly assigned faculty used the opportunity to introduce a small design exercise using the graphic skills to translate concepts into dimension and then into realization. The project Michael Lucas developed was based on several insights he had garnered from directing several summers of the summer high school pre-professional program: that students love the empowerment understood when tangible things are developed, and that there is an enthusiasm and focus that may be tapped under the right conditions. This project was termed The Nomadic Bedside Companion, and began with a small set of requirements for the student: accommodate
several textbooks, support the weight of the maker in a seated position, contain provision for a small hidden compartment accessed by manipulating the pieces of the project, and that the project be light enough to be carried by the student. There was no size limit, and materials the now somewhat familiar wood and metals. The project proceeded with a sketch set of drawings explaining the student concept and exhibiting form and a materials list that was critiqued by the instructor. A developed set of drafted plans followed with sketch details of joints and developed materials quantities was reviewed before proceeding to the shop. Discoveries by students typically were that their materials behaved differently than anticipated, their joints required modification, and that this design process is iterative and has back-looping of information- not as signs of failure, but rather all part of the design process. Completed work was exhibited on our college lawn area, with students demonstrating [usually with great success] their Companion’s structural prowess and operational, joint or material ingenuity. The idea that a shop-based activity course for freshmen could produce quality furniture/body–scaled kinds of projects was firmly established.

paraSITE

para: beside, adjacent to

SITE: a place where a particular event or activity is occurring

parasite: an organism that lives in or on another organism (its host) and benefits by deriving nutrients at the host’s expense

With the arrival of a new Beginning Design Area Coordinator (Kelly) in 2005, a revised curricular direction ushered in a new take on the scale and focus of the design build shop activity. At the heart of the shifts regarding this portion of the curriculum was this question: “At what stage in the design education should a student be engaged in developing a lifelong passion for their subject, manifest through the artifacts of a designing and making process?” Too often, this question is posed only after several years of “beginning” education, with the assumption that the student has mastered, or at least has a firm grasp on, the basic tools of “making.” The following documents an experiment embracing the notion of immersion at an early stage of design education, an experiment that put materials, tools, and ideas directly into the hands of first-year students before a traditional pedagogy would dictate that they are ‘ready’ for the experience. This experiment was carefully framed by three fundamental approaches; facilitation, guidance, and concurrency.

For this experiment, students were instructed, in part, as such: “you will design and build a composition that will be installed under the cover of darkness. This composition should have the objectives of engaging the body in some fashion (sitting, kneeling, laying down, etc.), framing a view, and being detailed and constructed with machine-like precision. This composition should be devised of the simple elements of points, lines and planes to formulate space, allowing for human interaction and intentional editing of the context. Students are to engage and challenge the site, thoughtfully considering the placement of the design to be a manifestation of the analysis performed. In addition to this, and most importantly, these compositions will be removable and should not permanently attach themselves to the building.”

During the initial conceptualization of the project, Professors Freeby, Kelly, and Wiley decided that effective facilitation in the form of appropriate and available site, tools, schedule and support was key to the project’s success. Upon appraisal of facilities, work areas, and students’ burgeoning interest in the design process, it was determined that the building currently occupied by the subjects for studio would make an ideal location for the installations. Sites were scrutinized and selected by the professors to provide sufficient challenge to the students, while intentionally
avoiding areas that could result in a thoughtless solution or impair life safety.

Once the design teams of three students were formed, they were directed to general site locations throughout the building and were asked to define their ‘site’ based on human proportions and their initial ideas on how and where they might perform their anthropometric studies. After agreement was reached, each team generated a set of hard-line as-built drawings to document and describe their chosen environment. These drawings were concurrently used as a basis for replication of their site through the construction of digital and scale analog models. The drawings and models were redlined and returned to the students until each team had concurrent documentation that accurately depicted the location of proposed intervention. Through the process, the students inadvertently explored human proportion and became aware of things such as handrail heights, stair rise/run, and other important anthropometric building information.

Students were also required to analyze in relation to the context of the site. Teams performed analysis on the existing sites through two different techniques. The first type was called “numbers analysis.” Students were to create a representation, two or three-dimensional, that translated one or more properties of the site thorough the use of abstraction. Topics varied widely but included such topics as circulation volume, daylight/shadow exposure, and proportionSCALE to mention a few. The second form of analysis was done through the use of joiner photography. Popularized through the work of David Hockney, this technique uses an additive means to aggregate multiple photographs into a cubist-like composition. Students were encouraged to photograph important views while also taking the liberty to edit out portions of the view not important to its comprehension. This resulted in the shape of the joiner being evocative of the shape of the view, conveying another layer of understanding of the site. (See Fig. 1)

As the discovery process progressed, the project was pushed even further. The students were clearly engaged and eager for more. Additional layers were added to encourage site assessment through a series of mapping exercises. Some mapped pedestrian movement if their space was in a highly trafficked area. Some mapped wind or sound movement. Each group was beginning the all-important phase of letting their site, with all of its inherent program, speak to them. The common practice of a beginning design student not knowing “where to start” was fading. It was rapidly being replaced by an entrenched analysis and process based philosophy.

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At this point in the project, the focus shifted to design. Students were challenged with the project at hand, that of placing an anthropometrically engaging, structurally sound installation of three-dimensional graffiti that could not permanently affect the existing structure in any way. During this stage, students initially worked individually to generate both digital and analog study model ideas for their team’s site. Upon completion, they reconvened, evaluated each other’s solutions, and formed a unified proposal for their idea. Analog and digital models were constructed and presented formally to the entire studio. Each team evaluated comments and critiques from colleagues and instructors and refined a design solution. Hand-drafted documentation of the design solution included details, overall drawings reflecting site and human interaction, and accurate digital models. The instructors, who all possessed extensive and varied experience in architectural practice, evaluated and guided the detailing of materials and connection techniques. At this point, a typical studio session often began in the design lab and ended in the wood or welding shop, with digital and analog tools in tote throughout. All students utilize laptop computers as a requirement of the program, which enabled them to explore design solutions regardless of their physical location. This became crucial as ideas, both digital and analog, were constantly revised onsite as construction proceeded.

True to the graffiti concept, students were not allowed to discuss or explain any portion of the project to any other student or faculty member not directly related to the project. This dynamic required evaluation, measurement, and analysis of design solutions to occur while maintaining a low profile. This process of construction was allowed a mere five days as students were forced to contemplate and execute decisions rapidly. Each team was responsible for dividing the tasks of construction, finishing, testing, and concurrent document revision. Many groups chose to test joints and ideas under cover of darkness. This strategy also served as a commentary on their position in the program: first year students in a hot-lab scenario.

Once off-site construction was completed, the students descended on their sites at 11:00 pm on the assigned night to install their interventions, a mere thirteen days after they were first given the project. The groups that had planned more diligently were able to complete installation in
two to three hours, while several groups made field modifications and were able to see the sunrise. No student was required to stay beyond 2:00 am however, nearly all participants stayed well after their project was in place, talking, reflecting, evaluating, and assisting one another. Both instructors attended the install, staying through early morning as a means of encouragement and a source of assistance in last-minute problem solving. The mood of the night was one of excitement and anticipation, with the value of teamwork interplaying with a sense of true accomplishment and creativity.

Fig. 3. Student paraSITE installation, 2006

The following week students were evaluated by peers and college-wide faculty in terms of their installation’s successes and failures, with specific regard to areas of site challenge, contextuality, material fit and finish, accuracy of drawings, and anthropometric engagement. These first year students could often be seen through the ensuing weeks discussing and interacting with students from all five years of the architecture program. The process proved to many that these beginning design students, with a scant fourteen weeks of design education under their belts, were able to achieve amazing collaborative success in a very abbreviated period of time. They universally became comfortable with the design and detailing of a physical composition, as well as the necessary components of physical execution. Additionally, and perhaps of the highest importance, many of the students involved in the paraSITE project either initiated or nourished a passion toward the study and practice of architecture through the design-build process even at a beginning level.

paraSITE’s Progress

In the 2009-10 academic year, the professional undergraduate curriculum was targeted for a streamlining, with two former freshman tracks, traditional hand graphics, with supplemental digital courses, merging with the digitally integrated track. ARCH 105 shop course and ARCH 160 digital tools courses were abandoned, but outcomes blended into the new single curriculum, now referred to as Beginning Design. Architectural Engineering faculty recognized that their students would benefit by being included in the new curriculum as well, so, the sixty students who had executed paraSITE grew to a 160 student cohort. Beginning Design faculty were keen to reuse projects that were felt to have a high degree of combined sets of skills (such as drawing, shop and teamwork), and provided a sense of accomplishment at key junctures, such as end of an academic quarter.

The winter 2010 version of paraSITE demonstrated all the inherent benefits and drawbacks of 160 students engaged in design, shop, and site. Outcomes in terms of student work were not seen as dramatically different that previous iterations; the project continued with a high degree of resiliency, student buy-in, transfer of knowledge across sketching, software, shop development, and field mock-ups. Some Architectural Engineering students were older students who
took this course in substitution for previous studio work they had missed due to transfer issues. This was a benefit in that they had a great deal of confidence in empowering their teams in a kind of expert knowledge of structure beyond typical freshman intuition. There was also a palpable group affinity in the cohort as a whole recognizing they were part of changes in the presence of the building. This was noted during the design process, but flowered during the night installation of the work, enabled by hot dog grilling faculty.

Negative aspects of the new scale of operations were also seen. Limitations of shop capacity emerged as conflicting needs of a concurrent student furniture competition in the college. While there was concern for issues of sustainability, the process of discovery and invention, which was encouraged, stretched the ability of many of the components of the projects to defy re-use in subsequent work, and produced a great deal of waste. While a good faith effort was made by faculty is assigning locations, the scale of work and location for of some of the projects technically compromised life safety aspects of the building, added combustibles to exterior exit paths, and protrusions into accessible paths beyond ADA criteria. Additionally, some final components were modified in field installation or final fabrication that required projects to be removed. Some installations compromised grass cutting and other scheduled landscape operations. These specific challenges lend new commentary to the Beginning Design student regarding their actions. When one’s hard fought process and construct is removed to give access to a handrail, they forever will understand the responsibility that comes with their physical actions.

Fig. 4. Brushed steel sundial paraSITE, 2010

Coda

Ideas of site, order, and form emerge from the paraSITE. While the idea of parasite inspires host: dependent relations, the project requires a form of listening and engaging site, touching and engaging materials, and engaging [sometimes in disagreement] one’s peers. The symbiotic nature of creation of new place from and with space, light, wind, and bodies is at the core of architecture, and vividly conveyed to the beginner in this process and project. The instructors set out to distill critical aspects of the design & construction process in a portion digestible to a first year student. As the first cohort to experience the parasite project walked through graduation June 2010, many cited the parasite project as one of the most formative experiences of their education.

Notes


2 The Initial parasite staff included Brian Kelly, Brent Freeby and Keith Wiley; the current Beginning Design collaborators are Brent Freeby, Michael Lucas, JoAnn Moore, Bryan Ridley and Keith Wiley. The success of the project is a shared team effort.