Cultivating Creative Minds

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Cultivating Creative Minds: The missing scale, the architecture studio's necessary evolution.

Introduction

In recent years studio pedagogy has inspired countless books and public presentations from business innovators, teachers, and best-selling authors such as Mr. Daniel Pink. Pink in his book 'A whole new mind' advocates the need to learn drawing, and the wisdom of playing games, as helpful means to advance creativity. He introduces creativity as the currency of the future. In contrast, the thinnest slice of our society now controls most of the world capital, furthermore, industrial streamlining is gradually replacing human production lines with robots and machines vanishing jobs and further depressing communities. Lastly, we in the U.S. have foolishly built our domestic economy on an ever-expanded thirst for mass consumption exhausting our planet's ability to regenerate. In short, we have constructed ourselves into a cruel and unsustainable world. Yes, the future is complex and requires further understanding through multidisciplinary collaboration and the ability to synthesize complex information into workable solutions. We know the world must be designed. And design is best served by studio education. So, for us to survive, we are called as people to abandon the competitiveness of the one (greed), in favor of the benefit of humanity. Our design challenge must be reset at the scale of our planet. While the value of design has risen drastically in recent years, our communities are still falling behind and demand justice and equality for all citizens. Health, comfort, and happiness surpass their status as stated goals, edging closer to becoming human rights. These foundational community concerns align perfectly with the architect's mission. However, we must ask ourselves, has our architectural educational model kept up with these dramatic changes? In our studios, our students seem to focus on the manipulation of building form, seeking the fleeting value they perceive in developing dramatic form. Process and discipline are replaced by software, twisting, and Boolean operations, which often result in admittedly alluring images. This observation is not to demean these incredible new innovative design tools. For they are appreciated and equally useful. But rather, to highlight the lack of understanding of them, as some students confuse tools with process, and always think the first to be the extent of the last. The design studio must be reconsidered. We hope to discuss and propose a new studio pedagogical model designed to meet the challenges we face today.

Methodology

Our search includes books, articles, web searches, examining three groundbreaking architectural schools. Additionally, we reviewed published research reports commissioned by the American Collegiate Schools of Architecture (ACSA).

The three examined architectural programs are, the Ecole des Beaux Art in France, the Bauhaus in Germany, and Taliesin in the United States. Three iconic schools that symbolize the historical continuum of contemporary iterations and adaptations of most U.S. architecture programs ever since inception in 1865 'when a course was established at MIT (Massachusetts Institute of Technology) (Bosworth & Jones 1932), followed by the Armour Institute, IIT's predecessor (Illinois Institute of Technology), and the Art institute of Chicago merging to establish their school of architecture in 1895 (IIT's website) which later was led by Ludwig Mies van der Rohe whom previously directed the Bauhaus and later became IIT's architecture program head in 1938. Mies and the Bauhaus, inarguably, has had a tremendous impact on our programs and profession. Finally, we explore Taliesin and Taliesin West (1937). A new model school founded and run by Frank Lloyd Wright and his wife Olgivanna, two influential and charismatic professionals and educators who also left their mark on architecture as a profession. One can add other iconic programs that fall within this same category, for one, the Cranbrook Academy, in Bloomfield Hills, Michigan, however, to focus the scope of the study, and to stay within the limitations of this paper, these three influences may be considered most essential and representative of the evolution and history of contemporary schools of Architecture in the U.S. This brief examination sets the stage for the second part of our curricular proposal derived from a four-year experiment at our own institution. The experiment is focused on the design studio, and its needs to evolve. Data used for this purpose is derived from qualitative analysis of the work produced. Measures include rate of success and quality of work. Our control is other work not using this method produced in parallel sections of the same studio. The expected outcome is a new method that expands students' inquiry's breadth and depth.

Three Architecture Schools' imprint on contemporary curricula

We begin with a brief review of the three selected architecture schools deemed important to the evolution of architecture education in the U.S.

Ecole des Beaux-Arts, Paris, France

In the turn of the past century, the Ecole des Beaux-Arts in Paris, became the principal destination for Americans seeking to study architecture. Many American architectural educators of the period were also trained in Paris and were called to teach in the first architectural courses in the United States, such as those at Yale, Harvard, and the University of Pennsylvania. The Ecole has a distinguished history among the most prominent European schools. It was among the first to develop methods and techniques designed to educate future architects and artists. The school organized students into ateliers (studios) (O'Connell, 2020) each working with a prominent teacher:

> Originally housed in an old regime convent reclaimed in the 1790s by arts aficionados to hold *spolia* of the Revolution, the École compound was expanded by one of its star progeny, Félix Duban, in the 1830s and became the center of an arts neighborhood, heartbeat of artistic production later in the century. The instructional core of the school, the so-called système des Beaux-Arts, featured

> an atelier structure, with students clustered in studios run by influential patrons; and a competition-based model of practice, with all exercises culminating in multi phased contests pitting students against one another for coveted prizes. *1*

In 1895 students between the ages of 15 and 30 could compete for positions at the Ecole. These included a growing number of international students, including a substantial contingent from the United States. Every year in the period between February-March and June-July, students had the opportunity to take a battery of entrance exams that would develop their standing and their potential admission to the studio. The school offered painting, sculpture, and architecture. The curriculum consisted of attending courses, completing exercises, taking tests, participating in competitions, and completing projects in studio.[2] Projects and exercises were juried by a select panel of professors. Courses included: General history, Anatomy, perspective for painters and architects, mathematics, descriptive geometry, physics and chemistry, the chemistry of colors, stereotomy and drawing plans, construction, building law, theory of architecture, literature, history of archeology, history of art and esthetics, history of architecture, drawing of ornament, decorative composition, and practical sculpture. All focused on the formation of a cultivated artist/builder. It is hard to overestimate the influence of the Parisian school on architecture education in the United States. In a published study conducted by Bosworth Jr. And Jones in 1932 for the Association of Collegiate Schools of Architecture (ACSA) one can note that the authors' survey of the 50 US and Canadian collegiate programs found many mirror instructions at the Ecole. The study also mentions direct influence from both American architects trained in Paris, as well as, several Frenchmen engaged to head the design studios of leading institutions, 'A significant factor in the picture of schools in the United States has been the practice of employing French critics of design'[3] (Bosworth Jr. and Jones 1932) These critics were exclusively men and had significant influence on the design studios syllabi of most American schools.

The Bauhaus, Weimar, Dessau, and Berlin, Germany

Walter Gropius in his manifesto proposes a new school that would erode the space between the trade crafts, art, and architecture:

> The art schools of old were incapable of producing this unity—and how could they, for art may not be taught. They must return to the workshop. This world of mere drawing and painting of draugtsmen and applied artists must at long last become a world that builds. When a young person who senses within himself a love for creative endeavour begins his career, as in the past, by learning a trade, the unproductive "artist" will no longer be condemned to the imperfect practice of art because his skill is now preserved in craftsmanship, where he may achieve excellence.

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[1] From O'Connell, L. Ecole des Beaux-Arts, Oxford Bibliographies, 2020
[2] Reglement De L'ecole, Ecole Nationale et Speciale Des Beaux Arts, Edition de 1895, Paris
[3] Bosworth Jr. And Jones (1932) A study of Architecture Schools, New York

His curriculum, and even some of the school's early exercises have persisted to this day. First year students go through an intense and specialized foundation course (Vorlehre or Vorkurs). Using exercises that many of our students still complete in our studios today. This course was intended to transmit the fundamentals necessary for any artistic work. The Bauhaus curriculum is represented by a circular diagram that layers the preparation of architects into four concentric rings.

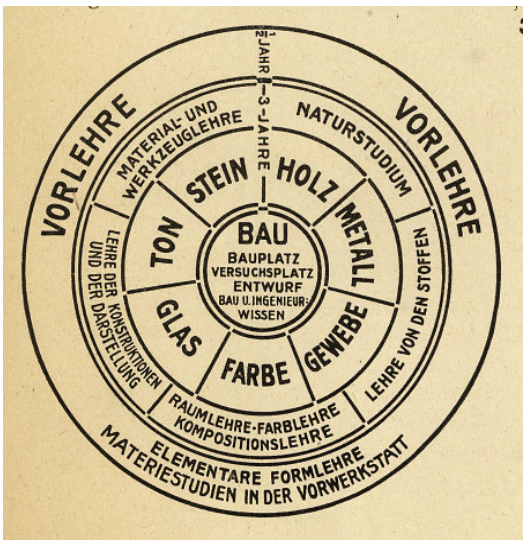

Figure 1: Bauhaus Curriculum Diagram, Walter Gropius 1922.
Source Bauhaus-Archiv.

The new school wanted to challenge current thinking and beliefs. Many schools of the period in Europe and the United States offered curricula revolving around design as indulging in forms and images of the classical orders of ancient and epic settings found in Greece, Egypt, or Rome. However, latest ideas of architecture were being simultaneously advanced, and circulated by new thinkers with strong influences from the Arts and Crafts movement of 1880 England, as well as the constructivist ideas of technology inspired design as the melding of processes between craft and industry. However, the Arts and Crafts movement was disinterested in mass production. Furthermore, Walter Gropius had been a leader in the German Werkbund. He was attentive to the needs of improving the quality of life of the populus. He sought mass fabrication to realize his goal. So, for him intellectual, artistic, and technical knowledge is essential for the study of design. 'The curriculum and the pedagogical approach of the Bauhaus brought together previous separate fields of arts, crafts, business, mathematics, engineering, and industry' (White-Hancock 2022). Students and faculty collaborated with industry on developing designed pieces sold to market and the returning proceeds were distributed to the design team including students.

Students benefited from this immersive model of making and integration. Goals and outcomes for each design are clearly understood as teachers and students teamed with technicians, industrial engineers, and business enterprises to execute their designs. The space between problem definition, users, and realization is diminished. In his manifesto (1919) Gropius states:

> The school is the servant of the workshop and will one day be absorbed by it. Therefore, not teacher and students at the Bauhaus but masters, journeymen, and apprentices

Students are expected to learn/master a trade, whether rug-making, iron work, furniture building, or jewelry. 'After becoming director in 1919 he issued a four-page brochure carrying his first Bauhaus proclamation' (Dearstyne 1986). Gropius said:

> The final goal of all artistic activity is architecture. Its embellishment was once the noblest task of the plastic arts, which were inseparable parts of the great art of building.

He later describes the program at Weimar,

> The character of teaching derives from the nature of the workshop:
> Organic creation developed out of skill in handwork. Avoidance of all inflexibility; advancement of the creative; individual freedom, but hard study…Constant contact with leaders of the craft and of industry in the province [of Thuringia]. Contact with public life and with the people by means of exhibition and other events… Promotion of friendly intercourse between masters and students outside of work; to this end theater, lectures, poetry, music, costume festivals…

The Bauhaus interest in simplicity, abstraction, and the essence of artistic expression where faculty and students blurred the boundaries between roles, left us a new way of teaching by doing and perfecting skills and knowledge. Such an open system of experimentation and discovery is bound to lead to disruption and innovation. Lessons and curricula developed by the school endure well beyond its closing in 1933. Exercises used by beginning studios of most architectural schools in the US are still modeled using projects and problems developed by Itten and Albers' Vorkurs (Preliminary Course).

Taliesin West, Scottsdale, Arizona, USA

While Bauhaus students referred to themselves as 'collaborators', those studying at Taliesin and Taliesin west were known to join the 'fellowship'. While both programs are built on the apprenticeship model, the latter implies the devotion and following of an accomplished 'brilliant creative mind'. The first talks of the blurring of boundaries between teachers and students, built on the questioning of established ways. Both schools had influential and strong personalities running them, 'fellowship' emphasizes the supremacy of the teacher over student. Both faculties introduced new learning cultures that one can enter willingly, so long they fully

commit themselves to pursuing a holistic way of life. In both schools' students mounted entertainment, cultural events, exhibits, theater, and concerts, were often held for the benefit of building community. At Taliesin, the fellowship highlighted the ultimate cultural immersion for the fellows. They not only studied, but they also lived and worked at the property. They built their own quarters, prepared meals, provided entertainment, and completed assigned shores such as maintenance and upkeep of their living desert compound. Learning from the farm in Wisconsin, Mr. Wright understood the importance of such activities in learning. During tough times, just before the great depression ended in 1939, they had to rely on resources available on the land. Food, building material, energy, and water must be developed on site in collaboration with nature. All of this was accomplished with a relentless pursuit for beauty and architecture. The result is an inspiring legacy that points the way towards a more essential, green, and sustainable model that is gentle and works positively with the land. Mr. Wright said, 'Organic architecture' his own concept of design, 'is distinguished from the facade-making which passes for modern architecture today, as you can see in our home, Taliesin West.' He believed, 'architecture is organic and part of human life,' where there is continuum between site, landscape, and interior spaces. He said:

> One must consider the site, the building, as well as the times in which it was being built, creating a harmony among all the different human and natural elements.

He then started referring to his work as 'Usonian style architecture', a reference to uniquely American architecture from the United States. His two books published by Wasmuth in 1910 in Germany 'changed the course of architecture in Europe.'

Mr. Wright began taking in students in the late 1930s. The land in Scottsdale Arizona was purchased in 1937. Taliesin West was intended to serve as his winter home and desert laboratory. The school represents Frank Lloyd Wright's ideas for educating American architects. In a New York Times Magazine interview, when asked about 'what he advises a young man going into architecture school he said:

> Well in my new book there is a lecture I gave in Chicago in 1931 and these are the things I told him concerning ways and means. To forget the architectures of the world except as something good in their way and in their time, not to go into architecture to get a living unless they loved it as a principle at work, to beware of architectural school except as an exponent of engineering, to go into the field to see the machines and methods at work that make modern buildings. I said they should immediately form the habit of thinking "why" concerning effects, challenge every feature, learn to distinguish the curious from the beautiful and get the habit of analysis. I told them to "think in simples" as my old master used to say, meaning to reduce the whole to its arts. And to abandon as poison the American idea of the "quick turnover," to avoid getting into practice "half-baked" and to take time to prepare even ten years.

Taliesin West is currently a UNESCO World heritage site. The curriculum is built on 'fellowship' executing hands-on architectural projects that are complemented

by an active calendar of lectures, evening entertainment, concerts, and theatrical performances.' As described by the Frank Lloyd Wright Foundation website. Taliesin is a remarkable educational experiment that endures and continues to inspire new architectural students.

Three pedagogical models at three different scales

The echo of these three programs still reverberates at various degrees in the halls of many of our contemporary architecture programs. As presented earlier, the Beaux Arts curriculum requires the students to acquire knowledge necessary to execute 'proper' buildings of the period. This included courses in archaeology, chemistry of color, the study of Greek orders, decoration, and sculpture, carving and bas-relief. Mostly concerned with the architectural scale of one object or structure at a time. A great deal of energy is invested on the composition, symmetry, and reinterpretation of ancient precedent including Greek, Roman, Romanesque, Baroque, and other magnificent styles of the past. Plans, elevations, and sections were specific subjects of course study. In a sense the architect manipulates solutions already available to them from past masters. Remixing and reconstructing new architectural patterns drawn from a reservoir of acceptable solutions. A difficult and costly process that could not keep pace with the upcoming public need for frugality, the age of the machine, and the industrial revolution. The built object scale drove this curriculum.

The Bauhaus curriculum introduced a new way of thinking for the arts and architecture. The school grew from the merging of guilds, craft, the arts with business, and industry. Finding solutions through an innovative blurring of boundaries among participants and the holistic integration across domains and expertise, especially between engineering and the arts. The school gave us the idea of workshops. These, through their name, imply teamwork and the synthesis of expertise for the development of a product. Field trips to manufacturing facilities (Dearstyne 1986) such as wallpaper factories, as well as collaboration among teachers and students with the aim of commercialization of design. The school designs and sells its creations. Students and faculty can get remunerated and rewarded financially from their designs. A sort of open, liberalized, progressive, and socially enterprising pedagogical system. The school's scale is internationally focused aiming to solve the problems of ordinary people, while also embracing the industrial revolution allowing design to be within everyone's reach. The esthetics are those of the essential, the minimal, and the necessary. Solutions are international, intended to work in any context. Ornamentation is a byproduct of the design and not applied to it. Rigor is in finding simplicity. Craft, business, and the industrial scale propel this work.

Taliesin brings us the importance of organic. The imperative of site and building as one. The impact of the design on nature. The importance of understanding regions and time periods for each project. Aiming to define a uniquely American architecture. Horizontality and 90-degree repetitive angles are the product of new drawing tools like the T-square and triangle, having their sway on the architecture. The importance of practical engineering and the use of local materials. Unity Temple being among the

first in the U.S. to use cast concrete as an exterior finish building material. A curriculum inspired by an amalgam between ethics derived from the agrarian sensibilities of midwestern farms, indigenous holistic thoughts of land and environment, combined with the importance of open plans and transverse horizontal spaces that allow the outside and inside to flow through the design. All-important tenants that seem to be sometimes both fading and returning to present architectural schools. In this case the pertinent scale is that of the local.

The missing scale

Our experiment aims at developing a studio learning structure that broadens and deepens the students' design work. The essence of the method is to approach design through a process of what we call 'layering of tiers.' These are designed to address a missing scale in architectural design pedagogy. The discussion must exceed the design of the object as professed by the Ecole, or the concerns of purity of essence, or mass industry and enterprise learned at the Bauhaus, or even the noble focus on land aiming for a harmonious regional fit as inspired by Frank Lloyd Wright, but genuinely consider all these lessons while also adding to them a strict dedication to social justice for all species and environments through the deep understanding of systems at the planetary scale. Designers must learn to gauge performance and strive for positive impact on all levels if we are to address an overburdened natural order. The task is monumental, and time is clearly running out. The key we propose lies in predictive analysis based on data. Our method was introduced as a response to our students' solitary fascination with object form-making, inspired by their introduction to powerful 3D modeling and representation software. The ability to extrude, twist, follow along rails, add, and subtract using Boolean operations, are all marvelous capabilities that must somehow put our young designers in a trance and prevent them from developing their ideas beyond the pure sculpting of objects. This technology is powerful and useful if employed to improve performance. It gives designers the power to develop solutions that might be closest to nature and the evolutionary process. However, the designers must also set their objectives and develop their assessment criteria.

Our Layered Tiers Method

The proposed method simply introduces along the traditional design brief (problem statement) a separate document, containing a strategic annotated 'table of content.' These two main documents combine to initiate the studio project. The final deliverable is a report organized by chapters as informed by the table of content. This new simple device grately improves the focus, depth, and breadth of the students' inquiry. Below we will present the table of content chapter structure and rationale.

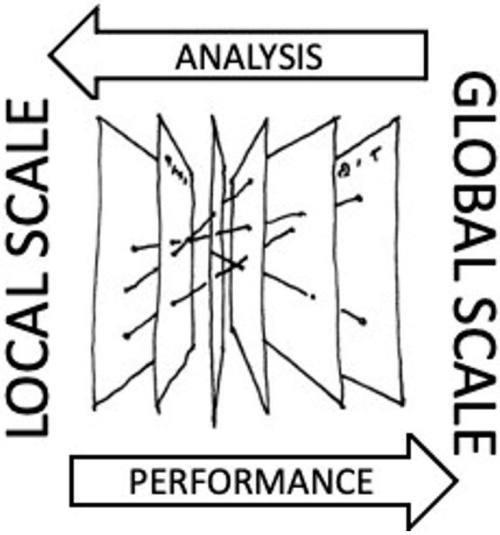

Figure 2: Layered Tiers Method Diagram

Chapter one

Clarifying the students' design beliefs so they may claim their design position. This chapter asks the students to define success for this design. They must develop their guiding principles as they respond to the problem at hand. The chapter attempts to clarify what we call 'This I believe' (TIB). The TIBs set the stage for an essential discussion regarding both design and process. Attitudes regarding approach/process, site, materials, contextual fit, ecology, culture, energy are among the TIBs examples developed by our students. The burden is on each student finding their unique voice as architects.

Chapter Two

This chapter asks the designers to 'find the art.' Understanding the context from both the natural and cultural dimensions. Decoding the site and learning its unique hidden potential. How can a new proposal connect to the existing natural system? What might be the cultural and human role here? What research and method are appropriate in this case? How can we come to understand all dimensions of a site and context? This work is focused on research and the development of methodology. Finding precedent and casework that might shed light on the questions above.

Chapter three

Entitled 'Synthesis and clarity' is the first mark on one's blank paper. Here the designer's ability to integrate by addressing their position, their research influences their ability to develop their architecture. Finding the most suitable idea requires taking one's concepts and measuring their success using their TIBs. Having several different approaches is critical. Developing multiple alternatives seems unusually challenging to our students. This step is important and often requires patience and encouragement from the studio critic.

Chapter Four and Five

Performance evaluation, simulation, and predictive outcomes are the essential stage. Beyond reflecting on the functional success of the design, the impact and behavior of the architecture is considered from structural, environmental, and material palette's embodied carbon. Digital tools such as Safayra, Cove tool, Tally and WUFI are immensely helpful at this stage of the process. Safayra helps with the passive and active environmental impact of the design. Giving live feedback as siting alternatives are considered. The software can also help with input on daylight performance for critical spaces. Cove tool informs material selection and embodied carbon's footprint.

Chapter Six

The Concluding chapter is concerned with the communication of the proposed design and the development of the final report combining all chapters into one publishable pdf book. Each project becomes a compact study of issues discovered by the designer.

Analysis, and Evaluation

The proposed 'layering tiers' method does improve the depth and breadth of students' design projects. It assists the class with the examination of design criteria that extends beyond just the manipulation of form. Based on student interviews, using this technique fosters clearer understanding of their own process and design position. The 'Layering Tiers' method reintroduces young designers to the broader scope of design. It allows them to question influential works currently celebrated by our media. The Process also equips them with a skeletal structure for meaningful inquiry when considering their own design choices.

Table 01. Analysis of student participants' success.

Year	Participants	Fail	Low Pass	High Pass
2022	14	0	2	12
2021	13	0	0	13
2020	14	0	2	12
2019	14	0	0	14

Source: Author, 2023.

Conclusions

The design studio is an important model of educating creative students. Many disciplines have translated and adopted this model to fit their own knowledge domains. In contrast Architecture schools were among the first to teach in studios but seem to have not evolved this critical part of the curriculum to include broader expertise and wider outlooks. We must review, reassess, reinforce, and open once again our curriculum to allow the studio to play its vital role in the education of future citizen architects. Where the concern is shifting from object scale to our planet's scale. Our Layered Tiers Method might offer a means to improve the depth and breadth of our students' design inquiries.

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