

***Architectural Representation and The Future of School
Design: A Research Report***

Daniel Li
Senior Project in Digital Media
Brain
New York University
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Abstract

What does an educational institution look like when it is seen through its inhabitants? How have its inhabitants influenced its design? How do these educational institutions reflect the feelings, emotions, and affects of its inhabitants, and how is it expressed through architecture?

Throughout its history, the study of architecture and design has proven itself fundamental to the advancement of schools and of models for education. The understanding of the school as an institution of control in traditional models, as an institution for social reform according to John Dewey, and other theoretical frameworks by educational reformers such as Horace Mann were all developed in parallel with new changes in its architecture. New pedagogical practices generally come with new architectural ones, yet they are not always in conversation with one another. School architecture more often reflects cultural, environmental, and economic issues than educational ones. As twenty-first century school design has become better suited to the health and wellness of its inhabitants, new efforts in architecture and design may now seek to re-examine the architecture of learning as well. In order to design around student-centered, experiential, hands-on, and other models of education, we will need alternative ways to see and understand these processes, which will require us to generate new conversations with visual practices, whether they are architectural, graphic, sculptural, photographic, filmic, or new forms that have yet to be seen.

Review of the Design of Educational Institutions

The literature of architecture and of the built environment—as it relates to school design, classroom design, and pedagogy—for the most part maintains a perspective on the matter that is unsurprising and in most ways, to-be-expected. Architects, planners, and designers assert the importance and necessity of environment and phenomenon as a factor in designing schools and educational institutions to varying degrees, though historiographically, they tend to cover the same general narratives and timelines.

Comprehensive histories of American schools and its architecture, like that of Amy Weisser, begin with the little red schoolhouse, or the one-room-school as the earliest examples. Its structural and programmatic details are often cited to references in Laura Ingalls Wilder's 1937 novel series, *Little House*, which recount her experiences in the one-room-schoolhouses, and provides contexts for seeing the room and its seats as the essential elements, or that which makes the classroom (Lange, 2018). Yet, it is interesting as a starting point, since symbolically it represents the common and most traditional conception of the space of the school as a room with seats. The structural core of such educational experiences has always been the classroom, around which all other accommodations to facilitate education exists. Such buildings are inextricably

linked to American housing architecture, as it is defined by the typical North American stove-regulated log cabin. Because of this, there was reason to call them schoolhouses.

Reformist education and alternative modes of American schooling in the nineteenth century is first introduced through the common school movement, advocated by Horace Mann as the figurehead of a major shift into a system of standardized universal education, controlled by state rather than by a school's immediate community (Weisser, 2006, p. 198). Meanwhile, Henry Barnard, outlined a restructuring of the design of future schools to accommodate such changes in his seminal 1848 book, *School Architecture*. Most of these designs continued to operate within the one-room-schoolhouse, though now differentiated by a normalization in structure between schools, such as the arrangement of seating in rows faced towards the instructor or the "front" of the room, whose authority was marked by a raised platform. Weisser and Baker both connect twentieth century industrialization with an increase in enrollment and with a multiplication of classroom units, at the expense of environmental quality (2006, 2012). Classrooms used for differing programs ended up impeding a number of environmental factors, such as light, air, and space, that disrupted the functioning of said programs (Weisser, 2006, p. 200). This practice of duplication defined both the capabilities and limitations of this model, which became increasingly disorganized and inhospitable with such an influx of bodies.

At the same time, new school practices began to appear as "turn of the century" standards which begin to focus on more well-tempered environments. Such practices are outlined in-depth in a report for the National Clearinghouse for Educational Facilities (Baker, 2012, p. 4). Baker (2012) pinpoints ventilation, heating, air quality, and lighting as the primary and particular methods for interpreting schools, which became particularly important as the older models of schools decayed into obsolescence (p. 6). Furthermore, the introduction of auxiliary functions, listed by Amy Weisser (2006) as "gymnasiums, auditoriums, cafeterias, locker rooms, clinics, laboratories, and workshops" served to reinterpret the school as house and "sanitation, fire safety, and square footage per pupil" as necessary considerations in the design of educational buildings (p. 200). These practices started to define much of the school architecture in the early twentieth century prior to the second world war.

Following the one-room schoolhouse, Baker (2012) delineates the progression of pre-war schools as "open air schools" (p. 8). This movement of architecture was coupled by progressive educational movements led by John Dewey, whose major contributions to philosophy, psychology, and education practices manifest in the introduction of student-centered pedagogy. His pedagogical theories assert that education and learning is achieved through social and interactive processes, thus designating the school as the proper institution in which to "enact social reforms." The traditional teaching model of direct instruction—what is nowadays colloquially referred to as lecturing—was rejected in favor of more experiential and inquiry-based approaches. Through such experiences, Dewey and his contemporaries hoped to prepare children through socialization; into citizens of "civilized" society, which he sought to

influence through schooling. His theories were recorded in a 1916 book, *Democracy and Education*.

Architecturally, his ideas took form as a school centered around a library with four surrounding departments for specialized learning—the kitchen, dining room, [work]shop, and textile industries (Weisser, 2006, p. 202). These departments corresponded to certain theoretical frameworks of experience, such as the kitchen and textiles departments geared learning towards the home, whereas the shop and textiles departments seek to socialize children into the worlds of business and trade. These principles were applied at the Lincoln School opened by the Teachers' College at Columbia University, to mixed results. Though it produced notable alumni—John D. Rockefeller enrolled his son in the experimental school program—it ultimately closed and merged with the nearby Horace Mann School. Its closure and subsequent merger was precipitated by an increasing desire for technological and scientific specialization going into the world wars era, while progressive educational models tended towards familiarizing students with arts-based curricula. Furthermore, the architectural legacy of rows facing towards an authoritative teacher was not challenged much in the earlier iterations of the Dewey model. Images showed that the classrooms of the neighboring Horace Mann School were slightly more relaxed, but hardly reformative of the previous practices of space.

Though Dewey himself was not an architect, the designers and builders of such progressive schools, primarily during the Depression era, included Eliel Saarinen, father of Eero Saarinen, Walter Gropius of the Bauhaus, and Richard Neutra. Their designs were much more revolutionary in their approaches towards more modern principles of design. Environmental factors, such as those listed before, were once again primary concerns in regulating the physical and mental wellness of students and teachers.

Postwar school architecture and its discussions in the 1940s and 1950s are irrevocably shaped by the Baby boom spikes, which drastically increased demand for school facilities and consequently constricted the amount of freedom and resources which could be devoted to each school (Baker, 2012, p. 16). Architects in the 1960s and 1970s era sought to experiment with prefabrication, open plans, building reuse, and technology use (which included artificial lighting as an easy and thus cheaper alternative to natural lighting) to economize and standardize the process of building schools. In response, budgets and enrollment were in steady decline throughout the 1980s and into the 1990s as a further backlash to such practices (Baker, 2012, p. 17). Yet in this period, alternative modes of building began to surface nearing into the twenty-first century. New standards for sustainability and energy-efficiency demarcated this period. Improvements to air quality, the benefits of natural lighting, among others led to the creation of the LEED rating, which remains as the current metric for the design of schools.



Figure 1. Desks remained in rows at the Horace Mann School, as continuing the standards of previous models (Gottscho, 1933)

Review of Architectural Visualization Practices

Contemporary architecture often continues these practices of environmental, perceptual, and physical exploration. The most interesting differences are the new possibilities and accessibility to digital methods of visualization, fabrication, and design research. Parametric design, isovist analysis, 3D modeling, and image editing—to name a few—place architecture in an interesting “post-digital” position, which have likely influenced how the roles of the profession are perceived. More and more complex theoretical projects, made with advanced

technological and computational techniques or with unconventional or emerging methods of visualization. Since the twentieth century, photography and film have allowed architects and artists to represent photorealistic concepts and, consequently, manipulate realistic elements through collage, montage, and moving imagery that impart indirect meanings and affects (Montage and the Metropolis, Techniques of the Observer). Gordon Matta-Clark, an artist well known for works intersecting art and architecture, frequently used photomontage as a means exploring and documenting ideas of space and in his Anarchitecture works. Other explorers of photography, film, and visual culture especially within the realm of montaging and manipulation of perception are identified by Martino Stierli in his book, *Montage and the Metropolis*. Eisenstein with his filmic connections to architecture, Koolhaas, van der Rohe, Lissitzky, and other artists and designers whose works have employed montage as a visual technique for creating affect. Stierli himself operates in the curatorial and exhibition at the Museum of Modern Art in New York, dealing heavily with the realms of communications in visual space.

These methods of documenting, representing, and displaying architectural ideas through drawings and models has allowed for things to be called “architecture” without necessarily being projects that are ultimately realized in a publicly-usable manner. Though it is the “built” environment, architecture reminds us that it has an artistic side of conceptually radical and speculative pieces, some of which become seminal works and references in its dense canon. The Italian architecture collective Superstudio famously showcased works that were never finished or even begun building. Rather, their self-described “anti-architecture” practices were either something more sculptural, or employing painterly and collagic principles to convey some not-so-traditional ideas about architecture (Wallis, 2016). Rarely, if ever, is a Superstudio concept drawn as a standard orthographic plan or section. Instead, they’re more like landscape paintings. Most interestingly, a style of painting whose depicted realism based on observation in the so-called real world. Yet, the subject matter of Superstudio’s imagery has no sensible or material realism outside of its imagined existence.

Since around the 1990s, the proliferation of computers into personal and commercial use has finished what photography started: to revolutionize image-making through the mechanical, non-human scales of modernity, according to Martino Stierli (2018, p. 2). In certain respects, this is true. Contemporary design processes and metrics for the built environment are impossibly complex, with environmental simulators and information software that only computers can feasibly calculate, such as Geographic Information Systems (GIS) and Building Information Management (BIM), in order to represent the complex processes which now characterize similarly complex buildings.

In other ways, however, mechanical and digital processes have not truly displaced humanness in these visualizations. In architectural drawing, digital modeling and rendering provide the most “believable” depiction of imagined apartment-buildings-to-be, often shown to prospective renters and buyers. It is not difficult to see the appeal, given their prominence in commercial, entertainment, and public applications to provide deceptive realities. Beautifully-

rendered digital images and visual effects, such as a fictional New York being devoured by plants in the 2014 “horror” short film *Wrapped* suggests so, even though such a scenario is perhaps as likely to occur as a Superstudio design is likely to be built. Within *Wrapped*, though most understand the setting as New York, it’s a version which betrays the lived city that inspires it through its absence of humans.

However, alternative techniques and drawing practices have risen from a synthesis of material, hand-made, and digital processes to challenge these ideas. The montages that Stierli discusses are products of mechanical processes, yet they also challenge those processes. Its defining nature is that of a collage, but pertaining to a heterogeneity of spatial or temporal moments juxtaposed into image (photography and film). Sam Jacob, in an article for the digital magazine, *Metropolis*, both writes on and shows the current state of post-digital architectural representation, describing drawings as “Frankenstein assemblages” (2017). The significance of the word, assemblage, to this post-digital world of image-making is elaborated on by Stierli (2018), as a technical term with roots in industrial carpentry. The joining of prefabricated parts, images, objects, events, emotions, and affects can both exhibit humanness and a machine-like quality, despite the fact that it can be made entirely within Photoshop.

Needless to say, however, that photorealistic digital rendering is the dominant mode of architectural expression to a wide-ranging public. Yet, they are not so great at expressing complex feelings and attitudes towards space and time as they are to the inorganic objects that make them up. In order to properly design for human behaviors, emotions, and feelings, it seems that more interpretative drawing techniques are still necessary in order to capture it.

Synthesis

As architectural representation is concerned with the depiction of spaces, phenomenon, and affects, it becomes an interesting medium in which to document or investigate the “unquantifiables” of a school space. While programs such as LEED continue to quantify and grade air quality, daylight, and other environmental phenomenon as metrics for livability by themselves, alternative practices offer counterpoints by revealing how such phenomena amplify, disrupt, or interact with each other and with the people that exist within them. These experiences or relationships or tensions are how students and teachers—inhabitants of the learning environment—experience the school, thus making these alternative practices more conducive to democratic modes of study.

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