Kit of (odd) Parts: From Still Life to Conjectural City

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Introduction

A kit-of-parts can be loosely defined as a limited set of pieces which can be assembled, disassembled and reconfigured into various unlimited constructions. Kit-of-parts theory has been applied to many disciplines, including manufacturing, engineering, robotics and even information technology. As an architectural teaching tool however, the kit-of-parts is most renowned as the nine square grid problem, which was first developed in the mid-20th century by John Hejduk and Bob Slutzky. Since then it has been widely used by educators to teach design composition as a formal issue. Originally this problem was comprised of an exact and restricted set of wood parts with precisely defined measurements. The limited parameters focused on possibilities for arrangement that established order and spatial relationships.

The reductive aspects of this assignment reflected the minimalist style that dominated that time. Many artists and architects who were part the modernist movement in the 60’s were reacting against abstract expressionism by turning away from gesture and emotion, toward a more pure and essential geometry. This can be seen in the work of Mies van der Rohe, and artist, Donald Judd. The nine square grid, as it was originally outlined by Hedjuk, was in accord with the modernist ideals of its time.

Over the years, design educators have continued to debate and modify the use of kits, providing rich ground for pedagogic discussion. While most educators agree that the kit-of-parts can provide a strong beginning to a curriculum by helping students develop a vocabulary with which to analyze form, structure and composition, there has also been strong criticism for neglecting important principals and considerations of design education like context, site, program and materials. Contributing to this debate in 2003, Professor Timothy Love published an article in Harvard Design Magazine.

“The nine-square grid and its progeny can be considered formative in the redirection of pedagogy in American architecture schools, although it was not pervasive until the late 1970s ... While the influence of these exercises can be considered positive for having energized and inspired avant-garde practice, the specific attributes of the exercises can also be criticized for what they left out. Most important, the term of the exercises severed the relationship between the sense of play afforded by sophisticated syntactical operations and the qualifying “content” of an architectural problem, whether the program or the rules of a constructural system.”

He goes on to argue that instead of rejecting the kit-of-parts, educators might consider injecting it with “an overlay of content to instigate the architectural process.” This content could be a site, a program, specific materials, or a narrative—as long as it relates to real life. But the content, he emphasizes, “must be introduced not as the Big Idea but rather as small-scale everyday intentions.” The intersection of materials like wood and steel, for example, provides a means “to include the corporeal world.”

The Kit of Odd Parts

This paper outlines an experimental project in which students were asked to create and then work through problems using a uniquely non-traditional kit-of-parts. This eclectic kit-of-parts was used throughout the duration of the course to teach the students about composition, representation, drawing systems and design thinking. Unlike the nine square grid problem, the kit used for this class was eclectic and varied.

Introduction to Architecture Design and Graphics, is a general education course, open to both majors and non-majors. As an introductory class it straddles art, urbanism, literature and basic design skill building. The lack of time, money and technical facilities devoted to this course made it impossible to fully develop a typical kit-of-parts sequence. These impediments led
to questions about the necessity for a kit to be so rigid and strict. Could students, for instance, learn the same basic design skills from a more makeshift kit? Could they develop an understanding about architecture as it is described by Hejduk.

"The nine square grid problem is used as a pedagogical tool in the introduction of architecture to new students. Working within the problem the student begins to discover and understand the elements of architecture... to probe the meaning of the plan, elevation, section, and details. He learns to draw. He begins to comprehend the relationships between two dimensional drawings, axonometric projections, and three dimensional (model) form. The student studies and draws his scheme in plan and in axonometric, and searches out the three-dimensional implications in the model. An understanding of the elements is revealed, an idea of fabrication emerges."

Furthermore, assuming that students could begin to grasp the elements of composition, construction and drawing systems, what else could an odd kit-of-parts teach them about improvisation and inventive techniques for architectonic design and creative practice? In order to answer these questions, an investigation began.

**Merz Principle**

The *Merz Principle* is a theory developed by the architect Yona Friedman in reference to Kurt Schwitters and his famous Merzbau construction. In what could be considered a manifesto or philosophy, Friedman assumes that reality is a process or series of processes, as opposed to a sum of information. He describes the *Merz Principle* as a "random agglomeration of things that form a whole."

The kit outlined in this paper advocates for a design approach that accommodates a range of disparate parts that don't fit neatly together. It argues against pure modernist ideals, proposing instead that *bricolage* be used as a methodology for aesthetic construction and creative planning. The French word, *bricolage*, means *do-it-yourself, improvisation or tinkering*. The word has been adopted internationally by artists to represent a process of creation using various materials that happen to be available. These materials could be mass-produced, hand crafted or cast off as trash or junk.

**Three Projects**

At the beginning of the semester, students were asked to fill a shoebox with regular and irregular wooden blocks, panels, rods, and other found objects. The only rule was that some of the blocks share the same size (any single unit of measurement, such as 3 inches in length) and all the materials fit together neatly in the box. Students were encouraged to use wood scraps from a woodshop—cutting sets of them down so that they conformed to a single unit of measurement, which was not specified. Students were also encouraged to hunt for found objects with diversity of shapes and texture including, screens, round shapes, grids, curves, fragments, rubber bands, putty, or fragmented objects. All objects that could fit neatly in the box were fair game.

**1. Still Life Composition**

In the first project, students employed the kit as a tool to explore a 1:1 relationship with objects in the context of still-life drawing exercise. Like a typical still-life drawing exercise, the goals were to learn how to represent light, shadow and volume through an understanding of value, shading, and texture. In addition to this, students also learned about composition and translation of compositions from 3D to 2D.

*Fig. 1 Example used as a demonstration for contents that might be included in the kit.*

*Fig. 2 Still Life drawings by Alma Crawford-Mendoza*
The assignment was to build a sculptural configuration that considers all the elements of composition—solid-void relationships, repetition, balance, flow, tension, and focal point. Once the composition was in place, they were to enhance the visual effects of light and shadow on their structure with a clamp light. Then, using a view-finding device, such as a camera, they were asked to make two still-life drawings: one from above, looking down on the arrangement, and one side or frontal view.

The use of found objects and recycled materials encouraged students to think about both the history of those materials—which contributed to the overall narrative of the composition—as well as the quality and intersection of those materials, which implied differing measures of interconnectivity and structural complexity.

2-Drawing Systems

For the second section of the class, students employed their kit-of-parts to learn about drawing systems. This section was divided into three parts: flat projection (plans, elevations, and cross-sections), axonometric projection, and perspective. The abbreviated instructions are outlined below along with images of student examples.

Flat Projection: Using the kit-of-parts, build a model construction that fits within an 8x10” rectangle drawn on 9x11” paper. Make at least four flat projection drawings of the model—2 elevations, one plan, one cross section. Scale is 1:1.

Axonometric Projection: Build an orthographic model that fits within an 8x10” rectangle on paper. Make a 1:1 scaled plan of the bottom of your model on graph paper. Turn the plan to a 45-degree angle and lightly transfer it to an 18x22” sheet of Bristol paper. Then project it upwards according to the model.

Two-point Perspective: On Bristol paper, make a 2-point perspective drawing of an imaginary abstract construction. Use your kit-of-parts to help you conceptualize the features of structure.

In both the Still Life project and the Drawing Systems project, students were able to use their kits to learn freehand drawing techniques used in design. In this way, students gained an understanding of beginning design as it was described by Hejduk above.

The final project differs radically from the nine square grid problem. With a nod towards Collin Rowe and Fred Koetter’s book, Collage City, this project explores the notion of bricolage in relation to urban planning and design. For Rowe and Koetter, bricolage is seen as a way for city planners and designers to embrace our pluralistic past, which can include an array of architectural structures—from ancient ruins to newly
constructed urban buildings. Like Rowe and Koetter, Yona Friedman also views the city as an agglomeration of parts that, over time, is destined to ruin if its users and designers do not understand the capacity for these parts to have new life.

This project developed in response to Yona Friedman’s assertion that, “Intelligence starts with improvisation.” If a kit of odd parts could help students to conceptualize the spatial representation of objects on a 1:1 scale, what could it teach them about speculative design in relation to the wider scope of art, architecture and environmental planning?

3-Conjectural Cities

At the start of this project, students were presented examples of radical architectural designs such as Archigram’s Walking City, Frank Lloyd Wright’s, Broadacre City, Paolo Soleri’s Acrosanti, along with other visionary thinkers like Buckminster Fuller and Hundertwasser. Included in the presentation was a short synopsis of utopian thought, beginning with Thomas Moore, and highlighting the influence that literature and philosophy has had on architectural design throughout history.

Our discourse was greatly enriched by guest speaker, Matt Bua, who came to our class to talk about his work. Bua, a visual artist, creates makeshift architectural structures out of mostly found material. He has shown his work internationally at public spaces including Mass MoCA, Art Omi, and PS1/MoMA in New York. He also co-authored a book called Architectural Inventions, which catalogs an array of vernacular, experimental, and visionary architectural drawings made by contemporary artists and architects. After his talk, Bua initiated a collaborative exercise in which tables were pushed together and students combined their kits to create a giant model of an imaginary city.

Needless to say, this was a lot of fun. But it also had educational value as it introduced students to new and inventive methods of appropriation, integration, and narrative in the context of an imaginary city.

The assignment began with a reading of Invisible Cities, by Italo Calvino. Afterward students had to write a fictional essay in which they introduced and described one particular building in one of the book’s cities. This detailed description was to include, among other things, the building’s purpose, site, shape, scale, materiality, light. This was their architectural invention in literary form.

For the final presentations, students had to create four drawings of their invention (and its site) using the representational skills they learned in the previous two projects. The drawings had to be done on 18x24” paper and could be constructed with any media including collage. One drawing had to communicate the thematic concept they developed in their essay. This could be done with text, graphics and images combined.
taught students that architecture is not just about designing habitable spaces, its also a speculative practice, which could include social dreaming, and futurescaping. And its scope extends deep into the cultural fabric that includes literature, art, philosophy, and science.

**Conclusion**

The paper suggests that a less standardized kit-of-parts can teach student about key architectural drawing techniques and creations in space. At the same time it works to foster a sense of resourcefulness and flexibility among students. It promotes inclusivity, while it presents the more difficult challenges related to the integration of form, idea, and material. As a beginning design tool, this kit of odd parts extends beyond 20th century preoccupations with form, abstraction and concept towards 21st century notions of heterogeneity, adaptation and resilience.

Taken together these three projects cover a lot of ground, from the pragmatic drawing skills used in a still life, to theoretical propositions set forth in visionary urban planning. Some might argue that this is in fact too broad for first year students. But, on the other hand, architecture is a broad discipline, and first year students should get a glimpse of the various ways it infiltrates our culture.

This project exposed students to the notion of architectural design as a fictional medium—one whose primary purpose is not just to design buildings but to propose alternate realities that provoke discussion and debate. It introduced students to radical designers of the past, making them aware of their cultural contributions. Most importantly, however, this exercise taught students that architecture is not just about designing habitable spaces, its also a speculative practice, which could include social dreaming, and futurescaping. And its scope extends deep into the cultural fabric that includes literature, art, philosophy, and science.

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6 Ibid.


10 “Yona Friedman”


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