Parti Boxes and Palimpsests: Leveraging history in teaching design principles

Author   Kristin M. Barry
        Ball State University

Introduction

Understanding a historical discourse is essential to the success of future design professionals. A comprehensive knowledge of precedent allows for innovation and experimentation by maintaining a diversity of thought and process. Yet, engaging beginning design students in architectural and design history courses is often challenging, as the presented material is considered temporally and conceptually removed from contemporary culture. While history is an integral component of design education, it is often divorced from the greater context of the architectural design studio due to the lack of connection between the material and modern instruction. With a variety of students entering the design professions, leveraging students' comprehensive experiences and proficiencies together with a historical dialogue helps to engage them in the study of history as precedent and process. This practice redefines the purpose and definition of historical concepts and relationship to "time," while reinforcing introductory studio principles. Innovative teaching of history using studio techniques, such as diagramming and analysis, presents the opportunity to [re]conceptualize design history curriculum in a way that engages and encourages students to understand the historical record as integral to the design process.

[Re]conceptualizing History Curriculum: Leveraging Studio Principles

The infinite and instantly-available material accessible to students through digital media, websites, and other non-academic sources has made teaching history and academic research a complicated endeavor in the digital information age. While reinforcing the importance of discerning and acquiring peer-reviewed information, engaging students in traditional historical research is often met with resistance, as many are unable to see the benefit of diligence in sourcing with the multiplicity of information available. This suggests that [re]conceptualizing the motivation and methodology behind historical research could impact the beginning design education of students, and reinforce the importance of history beyond the traditional coursework.
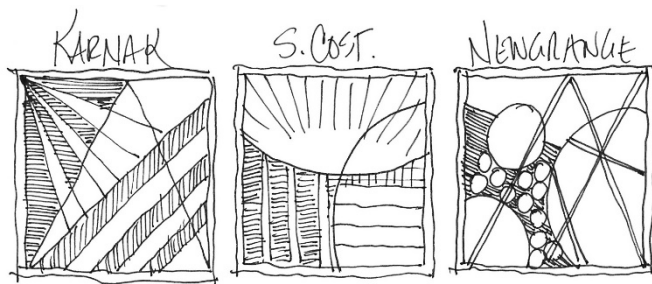
In contrast to the traditional pedagogy of design history education where students are asked to memorize and regurgitate fact, requiring students to research, process, and implement core theoretical methodologies behind the design of disparate buildings teaches conceptual diagramming and introduces the practice of utilizing history beyond precedent aesthetics. To counterbalance the desire to treat precedent study and architectural history solely as a form of aesthetic stimulation, research analysis provides a deeper reasoning for students to understand processes through time beyond mere visualization. With diagramming as the driver in this synthesis, students are able to move beyond the

literal copying of form or aesthetic and instead into a generative theoretical study, thus producing three-dimensional illustrations conceived in research and driven by design principles.

As students move through the early design process, they are exposed to the importance of technique and representation as part of their design communication and studio coursework. While studied as part of the Renaissance search for perspective, in the renderings of Étienne-Louis Boullée, or the illustrations by Archigram, these concepts are often tangential to the methodology of teaching history, and typically represent a passive approach to understanding influence. In traditional methodology, the importance of the individual component is in its final form as a representation of more thought-provoking principles, but is nevertheless finite. This suggests to students that their designs may find similar value in the complete idea, rather than the process of creation and discovery. By resetting this mentality and analyzing the value of methodology from the beginning, the historical narrative can begin to influence early design education, making it more integral and valued in the eyes of students, and reinforcing studio principles related to processes.

Parti Boxes and Palimpsests

In an essay on diagramming, Peter Eisenman states that "The diagram is not only an explanation, as something that comes after, but is also acts as an intermediary in the process of generation of real space and time" (Eisenman, 2010: 95). Often characterized as partis, these diagrams force the designer to simplify, and augment the concept as part of the design process. While many process diagrams used in the creation of historical architectural artifacts are lost to time, the latent ideas are discernable in the finished product, and together make up the design of the whole. The study of the completed building, while valuable to an early design education, is better understood through a study of the processes of its design and creation, where diagrams inform both the design process of the original building, as well as the interpretive process of the study. To interrogate these historical design methodologies and reprocess the information into new diagrams, students in the first of two sequential architectural history courses were asked to conduct extensive academic research on individual buildings or design complexes as part of a world historical narrative. In accordance with pedagogical and curricular goals, the project was intended to introduce methods of scholastic research, and allow for innovation in contemporary design through the lens of the parti diagram.

The first iteration of this was the Parti Box project, which asked students to research and produce multiple parti diagrams associated with the design of historic buildings, and then arrange these partis into a three-dimensional layered box [Fig. 1]. The assignment included both a physical model and an accompanying research brief describing the design processes, methodology, and thinking behind the construction of the historic architectural artifact. Students completed the project in pairs and selected

Figure 1: Development sketches of potential Parti boxes by author, 2015.

buildings from a list provided by the instructor to ensure that extensive information was available on each building. The list also guaranteed that research was required to discern essential concepts in the design without being too aesthetically-driven, and that the projects covered a wide variety of times periods to be studied that semester, demonstrating the idea that this was a consistent theme throughout the history of architecture.

Students were specifically given the restraint of the box (24"x24"x6" in the Fall of 2015, 12"x12"x6" in the Spring of 2016) to ensure consistency in the submission, as well as framing for the diagram. The box was derived as an abstraction of historical generative perspective practice, where the bounding cube creates the frame for a three-dimensional layered object or perspective construction. Early perspective studies such as Daniel Barbaro's *Pratica della Prospecttiva* (1569), provided the inspiration for developing the diagrams within a constructed frame, while Aldo Rossi's *The Analogous City: Panel* (1976) suggested the varied use of partis to arrive at a layered diagram. Students were asked to consider both in creating their interpreted diagrams of individual buildings, as well as discern latent ideas, geometries, and design practices in the historical record.

The resulting projects varied both in how students used the boxes as part of the design process, or as a frame for the otherwise independent diagram. A project on the Pantheon in Rome by Adam Horkay and Zach Rooker used the frame as a way to distribute light into the newly constructed architectural space, as a method of interpreting the significance of the oculus to the experiential quality of the building [Fig. 2]. The other parti diagrams that they derived from their research described the importance of the coffering to the organization of the structure and arrangement of the sphere within a cylinder for the sanctuary. Cassidy Davis and Krystel Marino's interpretation of Santa Maria del Fiore similarly reduced the main partis of the building into four layers intended to create different composites when viewed from each side [Fig. 3]. The complete diagram was envisioned as a new understanding of the historic architectural space, with attention paid to the simplicity of the diagrams and how they might interact. Davis in particular referenced the benefits of entrepreneurial learning in this instance and its positive effect on a deeper understanding of the building and time period, going on to say that, "Having to create a diagram for the most important or interesting parts of a building (without being too literal) was a fun challenge. I think basic diagramming [is] almost an afterthought when it [comes] to studio projects, but they are really helpful when trying to easily explain an aspect of a building" (2018: 1). Davis' assessment that the diagrams could skew toward being too literal to the historical architecture presented an interesting challenge following the first year of the project

Figure 2: Parti Box for the Roman Pantheon utilizing the frame as a way to distribute light into the diagram. Project by Adam Horkay and Zach Rooker, 2015.

[Fig. 4]. Several students, without prompting, conceptualized the box as architectural space, suggesting a revision in instruction would help students relate the individual diagrams more to each other.
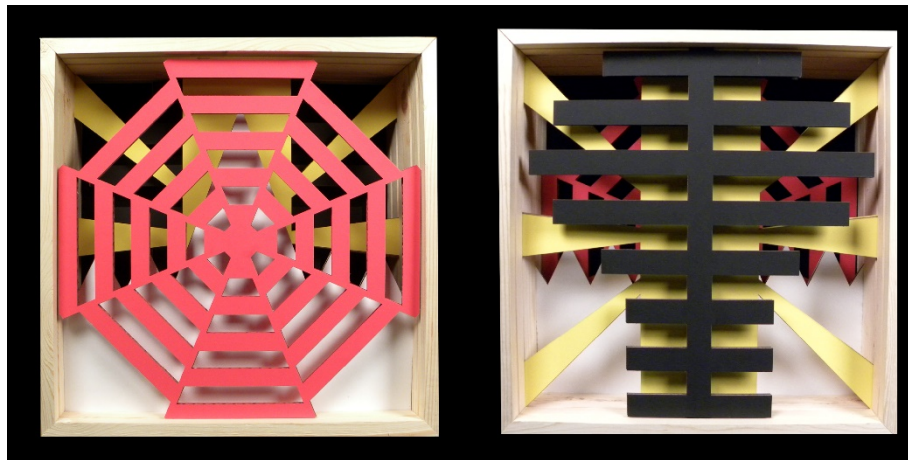

Figure 3: Parti Box for Santa Maria del Fiore demonstrating two different parti diagrams depending on the viewer's perception. Project by Cassidy Davis and Krystel Marino, 2015.

Figure 4: Parti Box for the Erechtheion with literal translation of sculpture and columns. Project by Katherine Weslowsky and Miranda Spaulding, 2015.

As a result of the first year of the project where the boxes presented layered 2-dimensional diagrams, the project was run the next year (Fall of 2016 and Spring of 2017) with modified instructions to encouraging students to design engagement between diagram layers. The subsequent Parti Palimpsest project was built on the concept of memory and culture in historic buildings. Alice Aycock's discussion of "collective historical memory" and "individualized experiential memory" and its place in the formation of architectural sculpture presented an opportunity for students to evaluate the buildings and created their own diagrammatic architectural sculpture, free from the box assigned to the previous class (2009: 86-105). As a tribute to collective architectural history as well as the individual experiential moments in each piece of historic architecture, the palimpsest provided an opportunity to engage both of these types of analyses when derived from the students' research. The palimpsest could offer a closer tie to the consideration of time within the historic design process, which was not a requirement in the Parti Box project. It also presented the opportunity to address interaction of the layers not just in the diagram, but in the historical building, as conceptualized by Rowe and Koetter in the Collage City: "To move now from the consideration of a collision of physical constructs to the further consideration of collision, this time on a psychological and, to some degree, a temporal plane" (1978: 119). The parts can no longer be only characterized as individual, but as a whole that

adapts over time, presenting the opportunity for students to better utilize the representation as part of the design learning process.

The Parti Palimpsest project therefore asked students to specifically investigate the interaction between the multiple parti diagrams referenced in the historic building, to create a three-dimensional diagrammatic model free from a frame and also able to addresses change and memory in the building over time. The list of buildings presented to this class was modified to feature architectural constructions that had multiple phases or which took several generations to build, such as New Saint Peter's Basilica or the Hagia Sophia, ensuring that the research and diagrams would represent time as a critical connection between the layers. It also encouraged students to address complete histories of buildings, including those with complicated timelines and a variety of functions over time, as with the Hagia Sophia.

The modification in prompt resulted in projects that were much more structured in interaction and multiplicity, with an awareness for the history of the design process, and the resulting aesthetic and theoretical change. Project such as Brianna Barr's Parti Palimpsest of the Hagia Sophia [Fig. 5] demonstrated the benefits of moving beyond the constrictive box in creating a comprehensive, multi-faceted palimpsest. While the individual layers representing the mosaic, column grid, and centralized plan are evident, they are connected by an inverted dome at the center, representing the importance
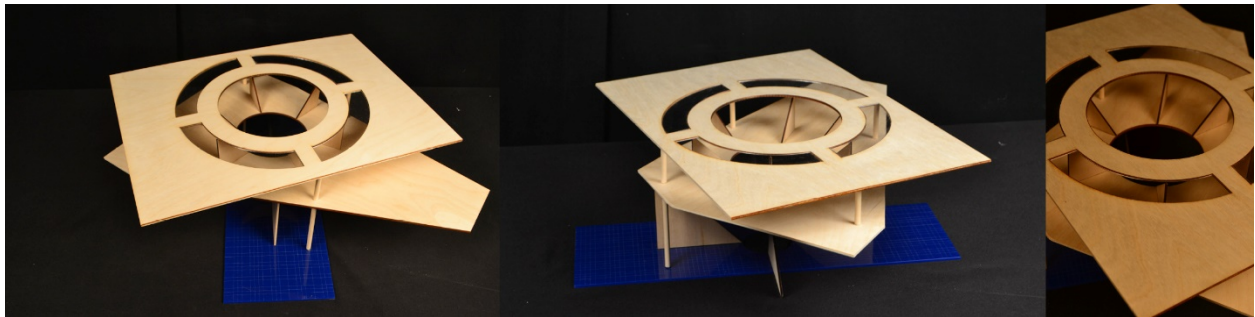
of the dome and structural pendentives to the construction and survival of the monument over time. The structural supports for the inverted dome allow light into the layers, representing the ring of clerestory windows lighting the main dome in the building. Barr's final impressions reinforced the importance of entrepreneurial research for architectural history, particularly how to understand historical concepts and their relationship to the built environment: "Normally abstract projects are difficult for me, but this parti project really taught me a lot about the importance of understanding an idea down to the root. Once you understand the initial idea and how it manifests, it is much easier to analyze the entire concept and understand not only how certain principles were used but why" (2018: 1).

The purpose of the research project and resulting models is to leave the students with a full understanding of the design rigor invested in the building and how this motivation was leveraged to produce critical architecture. To that end, students are essentially asked to read the architecture (as well as the history) to understand motivations in the creation of the piece. In doing so, the process

Figure 5: Parti Palimpsest of Hagia Sophia, Istanbul showing interacting layers and strategic use of materiality. Project by Brianna Barr, 2017.

teaches design literacy (how to read design documents and imagery), while reinforcing the importance of accessing and assessing historical writing.

Teaching Studio through History

In the beginning years of design school, courses are not necessarily treated as autonomous, and instead park of a comprehensive curriculum intended to synthesize many related architectural subject areas under the broader categories of concept, analysis, etc. Diagramming remains one of these important universal concepts when asking students to apply processes in different types of coursework. In an interview with Mark Garcia, Bernard Tschumi's thoughts on history and diagramming emphasize the principle that concept drives the future of the design process:

> Whether it is the dimension of time, or in the double colonnade of the Louvre, San Pietro in the Vatican or the Villa Savoye or the Farnsworth House, every time it is a cartoon but it still contains a concept, a certain moment in the history of architecture and the ways people looked at architecture. So because there is no architecture without concept, the diagram can become central to my discovery of new concepts, three- and four-dimensional, architectural concepts (Gracia, 2010: 201).

The purpose of precedent is to learn lessons from history in the way that architecture is conceptualized, designed, and engaged. The diagram is central to this process, but is rarely conceived in reverse, after the building is completed. As Davis realized as a student, understanding not only the completed historical building, but the process of creating it is impactful to how students will use that information in their own design process. In their book on representation and perspective, Pérez-Gómez and Pelletier cite Schübler's treatise (1719) as demonstrative of the perspectival hinge, where perspective study is used to conceive of three-dimensional architectural space (2000: 72-73). While this has significant impact on the practice and history of drawing, when combined with the palimpsest a layered three-dimensional perspective [Fig. 6], the practice has infinite possibilities for use as a method within architectural design practice.

Additionally, the understanding of how historical architecture is derived presents a way to engage students in architectural history through the language of the design studio. In a curriculum where studio is a prominent piece of design education, creating positive relationships between design methodology and related subject areas can further integrate design and design thinking as universal concepts applicable to most coursework.

Conclusions

The purpose of entrepreneurial education remains to engage students in the learning process through making and conducting research on their own, which provides an effective learning methodology when accommodating complex histories. The heterogeneity of the projects provide a lesson in understanding the importance of history as students work to translate a homogenous historical record. This project sought to transform architectural history into a community endeavor, where students are versed in the chronology, specialize in particular movements, and educate their fellow classmates on the importance of various historical design processes. As Barr realized through the process of her project, "I've had to create abstract projects previously, however I have never understood the intention behind those projects because I feel as if I walk away having learned nothing. This parti project in particular truly helped my understanding of abstraction and why it is important to understanding a concept" (2018: 1). The infinite diagrammatic possibilities that arise from students interpreting historical movements suggests a new way of looking at design history and how it can be impactful as part of the greater beginning design education.
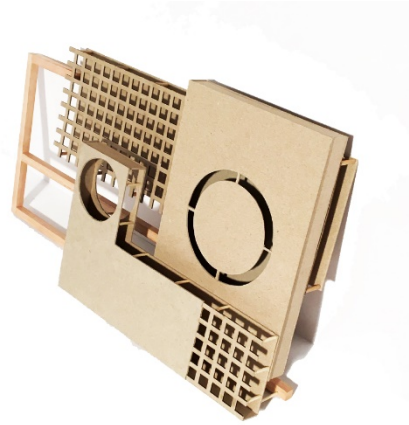
Figure 6: Parti Palimpsests of Hagia Sophia and Sakayamuni Pagoda. Projects by Ethan Talbot and Mack Pearson, 2017.

References

1. Aycock, A. (2009). Indelible Marker, Palimpsets, Thin Air. In: M. Treib, ed., Spatial Recall: Memory in Architecture and Landscape, 1st ed. New York, NY: Routledge, pp. 86-105.

2. Barbaro, D. (1569). La pratica della perspettiva di Monsignor Daniel Barbaro eletto Patriarca d'Aqvileia, opera molto vtile a pittori, a scultori, & ad architetti. Venitia: Camillo, & Rutilio Borgominieri fratelli, al Segno di S. Giorgio.

3. Barr, B. (February 21, 2018). Personal correspondence with author.

4. Davis, C. (February 24, 2018). Personal correspondence with author.

5. Eisenman, P. (2010). Diagram: An Original Scene of Writing. In: M. Garcia, ed., The Diagrams of Architecture, 1st ed. Chichester, UK: John Wiley & Sons, pp. 92-103.

6. Gracia, M. The Diagrams of Bernard Tschumi. In: M. Garcia, ed., The Diagrams of Architecture, 1st ed. Chichester, UK: John Wiley & Sons, pp. 194-203.

7. Pérez-Gómez, A. and Pelletier, L. (2000). Architectural Representation and the Perspective Hinge. Cambridge, MA: MIT Press.

8. Rossi, A. (1976). "La città analoga: tavola / The Analogous City: Panel", Lotus, 13, pp 4-9.

9. Rowe, C. and Koetter, F. (1978). Collage City. Cambridge, MA: MIT Press.