

Visual Literacy in Architecture Education

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Abstract. Visual literacy aids architecture and design students in decoding embedded meaning in our built environment, helping them address a myriad of issues from construction to cultural resonance. As a creative field, this built visual lexicon creates a foundation from which to vet project-specific issues, allowing students to reinterpret visual data in the process of creation. Colin McGinn (2004), in his book *Mindsight* posits that the phenomenon of envisioning new realities from the internal manipulation of previous visual experience is cognitive imagination. The question becomes how students can be taught to see in such a way that they intuitively look beyond visual composition to analyze what forces socially, environmentally, economically, politically, and culturally drove the design. As global practice has simply become design practice, architects and designers must find ways to address culture and bring a voice to those who are marginalized in our built environment. Architecture responds to the needs of the people, and as designers increasingly practice in cultures other than their own, they need to find ways to connect with disparate groups deeply. Traditional research methods play an essential role in this process, but as architecture is experientially understood, the study of visual literacy can unlock the three-dimensional manifestation of the inherent complex social and cultural data locked within architecture. Like the cyclical design process itself, this method of inquiry and analysis moves from one method (visual or traditional) and back again building in refinement as each cycle adds another layer of information. Yet to propel the field forward and especially to address marginalized voices this process must also allow for the translation of this information and the creation of new realities. This chapter investigates design education by studying the use of cultural coding and cognitive imagination in architecture education.

Keywords: Architecture education, culture, design process, imagination, visual literacy

The rich multi-factorial nature of architecture can be best studied in person, although through the proliferation of digital images made possible by the world wide web has allowed the visual analysis of buildings to be more accessible than ever before. The study of visual literacy in architecture is done through two primary methods of analysis. The first involves collecting images and coding them for a given criteria such as how the building is responding to cultural practices and environmental conditions. The second is utilizing images as a tool of reflection where the viewer contemplates an images while imagining a spatial construct which lays outside of the frame of the photograph. McGinn's (2004) notion of

cognitive imagination where one takes a variety of images and combines them in one's mind, forging a new spatial reality from fragments of previously seen spaces, aids architecture students in creating informed alternative realities. Through cognitive imagination, students can address the complexities of design in both an efficient and effective manner. When aided with analog and digital tools of inquiry cognitive imagination can help architecture students push beyond the actual to conceptualize new possibilities in design. Using the visual literacy techniques of image coding and mind's eye image construction as their foundation students can assemble advanced bodies of knowledge through the synthesis of shifting and varied

sources uniting disparate categories of data into a new whole. By doing so they can address the complex forces including, social, cultural, political, environmental, and economic forces which inform the process of design.

The manipulative mental process of “viewing, altering, and combining images is called cognitive imagination (McGinn, 2004). Through this process one shapes and unifies distinct images or parts of images forming them

into a whole that has not been realized before (see Figure 1). This aptitude can be harnessed by architects to create three-dimensional constructs forming space and experience in their mind’s eye. This tool of iterative spatial and experiential investigation can, therefore, aid the design process. These imagined constructs can be assembled from prior experiences, refined through remote viewing, or for veteran architects, based on learned intuition.



Figure 1. Matthew Dudzik. Shifting Perspectives: Mexican Identity. 2017. Photomontage. Courtesy of Artist.

Mind's eye envisioning as defined by McGinn is when the mind reconstitutes components of an experience instead of the traditional theory that the image in one's mind is a memory of a sensory experience. As such, the mind's eye does not just recall that which it has seen but constructs new realities within this inner vision. This type of alternative spatial scenario creation allows architects and students of archi-

tecture to iteratively design and expeditiously explore advanced concepts. In addition, McGinn reasons that imagery exists separately from the recalled perspective of the mind and is not reliant on the quality of what has been perceived or on the sensory object itself.

By collecting, sorting, and mentally constructing visual images, the designer tests various design opportunities. The ability to envi-

sion and shift the plane of ocular reality offers the architect the possibility of creating with empathy and designing for the cultural context. Visual literacy in the design process can be seen through Kavakli and Ball's (1998) work where students sketch chairs from memory. They were then asked to create a new design of a chair. The researchers found that "there is an intimate relationship between the cognitive and perceptual processes that are brought to bear on the recall and design tasks and idea sketching" (Kavakli & Ball, 1998, p.485). A study by Donna Wilson (2012) took this visualizing further by asserting that persons who are creating based on the use of mental imagery methods have increased cognition and recall of the texts that they read.

When envisioning in one's mind, designers can both complete the frame of the section and visualize alternative realities. This process of dissection and recreation, made possible by visual literacy, can help the designer comprehend the numerous influences at play in the design of the built environment. By creating mentally, especially when influenced by images embedded with latent cultural content, the designer can reconstruct pieces of information in ways that allow for invention. This can lead to a greater sensitivity of both experiential and technical considerations in design.

The inherent intricacy of mind's eye envisioning is intensified by the numerous functional, technical, social, cultural, and environmental needs of a project. In addition to visualizing spaces, investigating them through an iterative process encourages comprehension and consideration. Architects explore contemporary creative practice through the integration of known conditions, elements, and factors. This investigative and imaginative method of visual assembly, dissection, and recreation is based on visual literacy and mind's eye spatial construction, allowing designers to conjure innovative connections amongst architectural components. By doing so the student shifts the lens and scope of the investigation to either emphasize a distinct element or "zoom-out" to examine the design comprehensively.

At its core, a design studio where students are given an architectural program and ask to

create a building responsive to the users, site, and cultural in which it is placed, should be a thinker-space that offers a dynamic, challenging yet supportive and rigorous environment in which to test ideas. By envisioning oneself beyond known situations, the architect can picture the unrealized with better cultural understanding allowing the student to design with genuine empathy for the end-users. By utilizing visual literacy to decipher and interpret data from images while researching the culture of a given place, the designer can use iterative practice to formulate a meaningful design (see Figure 2).

McGinn (2004) suggests that the internal eye is a system of both recollection and formation of one's cognitive imagination. He argues that through this process, "we can suspend judgment and effectively survey endless possibilities" (p.162). Architects must unite the intuitive and investigative to construct new and meaningful environments that are responsive to place and climate.

IMPORTANCE OF CULTURE

Globalization has rapidly propelled the profession of architecture to an international stage. With this new broader arena, the professions need to develop a deep understanding of the cultures in which they build. As global practice has become standard practice for architects, they must work to understand both local and global best practices in design and construction. This type of critical cultural response is crucial to produce architecture that meets the varied requirements of a given place or people. Necessary areas of consideration include experiential concerns: social norms and cultural practices, as well as technical concerns: appropriate environmental responses, building practices, material availability, and governing economic realities. By decoding latent cultural meaning in images and conducting field study the architect can be more responsive to the need and desires of the community.



Figure 2. Matthew Dudzik. *Alternative Realities*. 2010. Photomontage. Courtesy of Artist.

After all, while the practice of architecture may be global, the person using the building is from a local community; therefore, the building must be designed to be responsive to that culture. Visual literacy is utilized as a part of a cyclical process of designing, critiquing, and altering based on new information which when coupled with traditional research methods aids the architect in engraining an informed cultural perspective in their designs.

Architecture is experiential, leading inhabitants through a series of thresholds and places of dwelling both functional and at times animative. This is a multisensory journey and the experience of moving toward and through a structure has the opportunity to engage each of the senses while also making cultural connections to the place and for the people for which it was designed. Certainly, one of the most power-

ful senses in navigating and decoding embedded architectural meaning is the visual. When using the visual literacy technique of image coding the designer must also reference scholarly text and data driven approaches. Bringing together experiential and technical considerations in a way that is appropriate for a given society is a complex undertaking and one which demands a rich cultural understanding.

Bauhausian modernism, the school in German which originated a visually pure architectural language and which later evolved into the 'International Style,' attempted the homogenization of architectural language through purporting that one visual style is appropriate across the globe. Brolin (1976) suggests that the International Style lacks an understanding of the culture and place in which it is located, making the buildings appear

generic and listless. He concurs with others who have argued that while modern international architecture purports to be "the logical outcome of a rational approach to design with new materials and techniques" (p.15) that this is simply a rationalization for stylistic preference rather than an inevitable outcome. Brodin concludes by saying, "public apathy [about modern architecture] is largely because the majority of people are disturbed by the sterile appearance of modern buildings and are not interested in the intellectual ideas that the buildings represent" (p.9). However, it should be noted that a more progressive reading of modernism would note the numerous successful examples of buildings that have been integrated into their cultural and social landscape.

To examine architecture's cultural response in its most insulated way we can look towards illustrations of how prevalent cultural currents have affected architecture in the ancient world. Two illustrations of which are the sites of Parthenon in Greece and the temple area at Machu Picchu in Peru. Both drew on cultural perspectives, rituals, and beliefs as well as local environmental conditions to create ceremonial sites tied to the people and landscape for which and on which they were built. Rodriguez (2007) compared the two during a lecture at Virginia Tech, stating that when one leaves the Propylaea gate on the Acropolis in Athens, all one can see is the Parthenon, sky and the stone at its base. It is a perfect monument to what humankind can accomplish and speaks to ancient Greek ethos. On the other hand, when one enters the Sacred Gate in Machu Picchu one sees the sacred mountain framed. Rodriguez stated that this happens again and again in Peruvian sites where religion converges with nature, the worship of Mama Pacha, the condor, and the snake.

The need for architecture to respond to the genius loci, the spirit of place, and our collective cultural zeitgeist remains necessary today. Culture is a broad term and encompasses the beliefs, actions, and products of society. In the same way that one can see how fundamentally tied culture and the built environment were in ancient civilizations, it can be recognized the intrinsic need to create architecture today that

recognizes, respects, and functions for all. King (1990) parallels these thoughts when he posits that all "professions which deal with the realities of the built environment need, (and in many cases, also want) to understand questions concerning the long term economic, social or political outcomes of particular design policies or decisions" (p.397). By doing so, architects and designers can employ culturally relevant practices to generate significant and fitting spaces.

The need for architecture to be more responsive to the social, economic, and cultural needs of society has started to generate critical discourse on the subject. Rapoport (2005) investigated how environmental-behavior studies, anthropology, and other relevant fields [such as visual literacy] can produce healthier and more inclusive environments. He noted that numerous advocates of modern architecture think that technologically progressive societies share a communal context, but he postulates that each culture must also reference and be influenced by its past and its climate. He also stated that "one way of expressing this connection is through visual traditions, but these have been intentionally excluded from modern cities throughout the world" which led to lamentations that "the spiritual loss is real and people of all cultures sense it" (p.12).

In reply to these appraisals, Winchip's (2010) book scrutinizes visual culture through six categories, that are offered using an internationally transdisciplinary structure and as such study both the discrepancies and conjunctions of world events. She noted that Haussmann's redesign of Paris was an example of the complexity of integrating various social, political, and environmental concerns into design. Winchip (2010) explains that insurrectionists utilized the twisted and slender street layout of the old city to obstruct certain areas. She writes that the unplanned cityscape gave the revolutionaries a strategic advantage. Urban lanes were obstructed with each period of civil turbulence from the 1789 French Revolution to the 1848 February Revolution. These blockades were made famous by the painting, *Liberty Leading the People*, by Eugene Delacroix and in the book, *Les Misérables*, by Victor Hugo. Subsequently, a new urban layout was

necessary to assist the army and restrict the ability of people to impede free flow on the streets. Haussmann's new design for Paris comprised "large, open areas and wide boulevards" (Winchip, 2010, p.13).

The revolutionary redesign of the urban plan was not merely a defensive tactic but also a visual one. Winchip (2010) noted that "Napoleon [III] wanted a city plan that reflected the glory and power of France by adding more civic buildings, parks, gardens, and modern amenities, such as gas lighting, underground sewers, and adequate healthy water" (p.14). Haussmann's redesign of the city of Paris reinvented the formal order of urban planning and was constructed from 1853 to 1870. This urban organization archetype "establishes a formal architectural order with grand processionals and open public spaces," that harkens back to Roman public structures and "reflects the power and glory of Paris" (p.14). The redesign which started because of military concerns grew into a publicity campaign for the state to express the vibrant economic, cultural, and political climate of the time all the while integrating technological advances that enhanced the health and welfare of the public. It demonstrates the complexity of the forces that affect the built environment and how its visual identity not only correlated with but also propelled political power and national identity.

Travis (2010) focused on an under-represented culture in the design world when he examines the essentials of African American and black design in an attempt to recognize their cultural consideration in the built environment. He stated, "I contend that it is when a building, buildings, set of buildings, or spaces/ places reflect and serve the people of the community for which they are intended" (p.316) that design is successful. He purports that culturally resonate design "lifts the spirit and provides shelter and functional use that fosters positive aesthetic and tactile relationships" (p.317). He suggested that there is a dearth of awareness of how architecture can produce "a sensual environmental design interpretation that speaks to African or black sensibilities in ways that other art forms have evolved, expounding that "concepts or themes of blackness reveal themselves in art, music, sculpture,

writing, poetry, dance, religion, and so many other aspects of the African or black experience" (p.317-318) but have yet to be fully realized architecturally.

Furthermore, Travis establishes parameters for the assimilation of African or black culture in the built environment. The tenets he has recognized for including and being empathetic to black culture are conceptualized through ten principles. Like previous architectural treatises from Vitruvius and Palladio, his list of values gives architects and designers a basis from which to design. Within any given setting cultural relevancy in design engages the community in a crucial discussion of the meaning of place and fundamental ethos of the society. Since culture is both a focused and all-encompassing amalgamation, the architect must embrace the unique character of a place and its people into a design.

EVALUATIONS OF ARCHITECTURE

Critiques of modern architecture frequently suggest that buildings lack an understanding of the role of the built environment in the larger cultural context. Robert Venturi (1966) addressed this topic in his book, *Complexity and Contradiction*. He stated, "a valid architecture evokes many levels of meaning and combinations of focus: its spaces and its elements become readable and workable in several ways at once" (p.16). He posited that when the architect fails to address the complexities of placemaking "the building becomes a diagram of an oversimplified program for living — and abstract theory of either-or" (p.17).

Brolin (1976) asserted that design had "failed wherever the architect disregards the social and aesthetic values of the user" (p.8). He suggested that this occurs when structures do not assimilate to their "environmental, social, or cultural context." Brolin suggested that "the disillusionment with modern architecture came about because architects imposed their values on a public that did not share them" (p.44). The application of his assertions can be seen in the unsuccessful acclimatization of Western

designers who produce with their cultural context in places where it is either not recognized or valued. Predominant examples include William McDonough's Huangbaiyu, a sustainable town in China (Sacks, 2008), and Michael Graves' Miramar Resort on the Red Sea (ElMasary, 2006).

Rem Koolhaas (1996) argued that globalization and regionalization are vital elements of modernism, which he concedes are paradoxical ideas. Discussing postmodernism, contextualism, and regionalism, he posited that, "the important thing is that they are all seamlessly and effortlessly part of an overall process of modernization a process which in no way is connected to modernity as an ideological, let alone artistic, movement" (p.235). He urged that architecture is no longer linked to meaning and place-making but rather has become an artistic brand applied without consideration to the culture or climate in which it is built. He joined Venturi in his apprehension that placelessness "may be the real essence of globalization" (p.235).

Venturi, Brolin, and Koolhaas spoke to the need for design to be germinated from its context and formed for the people who will eventually occupy its spaces. While Brolin supported a more established conception of cultural relevancy, Koolhaas (1996) maintained that "architects have to develop the humility to see ourselves as part of a process, as particles that submit to laws other than those of our genius" (p.235). To design a building that represents distinct cultures architects must address not just that which is, but study the multifaceted nature of culture to conceptualize that which can be. Utilizing image coding visual literacy aide's architecture students in understanding the synthesis of cultural, social, and economic forces that are embedded in architecture.

TOOLS IN THE CLASSROOM

To allow new ideas to germinate, the studio must be a thinker space that fosters individual and collective creative pursuits. By supporting each student's interests and research agendas,

relative to a given topic, the collective studio benefits from a more diverse vision of key project considerations. The studio round table critique, where all members of the studio share with one another, allows the individual student to test his/her ideas while allowing classmates the ability to see the project from a different perspective. Honesty, accountability, and rigor must be fostered through this process and the sharing of products produced by both analog and digital tools.

With a foundation in visual literacy and traditional research methods, intentional exploration can be done through hand drawing, three-dimensional modeling, physical prototyping, and other virtual or analog tools of investigation. In this process, technology is simply an instrument that requires the user to unlock the potential of the tool to explore critical issues discovered through research and visual study. Developments in technology have changed the tools and some-times the pace of the design process but they have not fundamentally changed the need for designers to assimilate to the experiential and technical realities of a given place or culture. This cultural foundation grounds a project and creates a lens through which to vet the success of a scheme regardless of the tool of inquiry.

The art of intentional viewing allows designers to both decode images through anthropomorphic investigation and to create spaces through completing the volume in their mind's eye. As such visual literacy is both a tool of investigation and one of contemplation, imagined alternative realities spurring deeper research. Visual study is critical for architects to be able to effectively create buildings in cultures and climates other than their own. Starting with images pertaining to a given project, climate, and culture, the designer can understand technical and experiential factors. Through cognitive imagination, the designer also can contemplate that which lies beyond the frame of reference and potentially beyond reality.

If we are to look at what the Beaux-Arts would refer to as the diagram of architectural origin — the Parti — fundamentally, it is a visual device to establish and test a set of parameters for design effectiveness. Parti pris means a bias or a mind made up, an assumption that informs

an approach, but how do designers establish key criteria within a scheme? While this may be done slightly differently in various professions within the built environment with architects traditionally organizing based on programmatic adjacencies and interior designers at times adding a metaphorical layer both distill complex spatial requirements through this diagram. Through utilizing mind's eye envisioning and cultural coding techniques visual literacy aides the designer in understanding how the complexities of our built environment synthesize within a given scheme. As design offers unlimited possibilities it embraces the hypothesis as a fundamental process of construction, which directs a project toward a given set of goals by leading it through a guided path of inquiry.

An example of this process was used by Whitney and Fritz in their interior design studio for Commercial Office Design at SCAD in 2009. The sequence of assignments began with students collecting visual and written data on a client of their choosing and synthesizing their research into a three-minute video about the culture and ethos of the organization. With this deeper understanding of their client's motivations, they selected five photographs that reflected those aspirations. Then, for each photograph, they sketched ten two-dimensional drawings of a portion of each image and wrote five keywords that corresponded to each picture. Finally, the students chose one of those two-dimensional images to inspire their Parti from which they designed the three-dimensional layout of the office space base on this abstraction in tandem with their greater body of research on the client. Students also created their concept statements off of the keywords found through their analysis of the five selected images. By using this Parti model, the final project had a consistent design and communication language, which reflected the client's mission. This method could also be utilized to gain a more global perspective and serve as a method of societal inquiry as it did corporate identity here.

Developing powers of seeing with intention allows architects and designers to formulate culturally significant spaces. The example above by Whitney and Fritz shows through

investigation, contemplation, and iterative inquiry, a visual lexicon can be constructed and utilized to shape the design processes. The purposeful decoding and examination of images can allow designers to build a body of knowledge guided by analytical parameters. These inquiries can be as diverse as vernacular approaches to environmental design to gender identity in architectural ornamentation. The purposeful application of visual exploration, which is transformed by one's cognitive imagination allows architects and designers to analyze and assimilate both visual and technical data. This process of engaged visual inquiry allows students and professionals to research the interconnectivity of design parameters in our built environment. This visual-spatial data analysis informs visual practice and the creation of ethical environments.

Much like psychotherapy, new cognitive realities take both time and freedom to envision. A supportive studio environment asks vital questions not to seek a directed learning outcome but rather to allow driving forces to be discovered and reflected upon. This process of analyzing and synthesizing data is key to creative pursuits. By allowing the mind the space to address the knitted complexity of a given design project the student can see that a problem is not black or white but rather brown the mixture of all colors in uneven balance. Through an analytical approach, the student can utilize a variety of tools to parse out various components or fundamental pairings for a given project. This allows for a foundational understanding of key influences and facilitates the student synthesizing these complex and at times, contradictory driving forces.

As design educators recognize the significance of seeing, many offer field trips, visual presentations, and in situ examinations of the site. Hand sketching is one technique utilized to help the student interpret what they are viewing and to represent those elements that are the most significant to what they are trying to highlight. This method promotes drawing skills as well as cultivates an awareness of the layered factors influencing the built environment (see Figure 3). Through these structured visual exercises, awareness is brought to the experiential, technical, and

ephemeral considerations of design. This type of engagement requires active viewing and interpretation of visual data. While students may purposefully unpack what they are seeing without sketching the addition of this hand to eye to mind connection reinforces visual data and requires a hierarchical relationship to be

placed on each element. However, when in situ explorations are not feasible, images help to democratize the study of architecture, allowing a greater number of structures to become accessible than any one person could see in a lifetime. Visual inquiry can, therefore, be done through both immersive and remote viewing.



Figure 3. Hsu-Jen Huang. Travel Sketches. 2019. Watercolor sketches. Courtesy of Artist.

There are advantages to the confines of the photograph as well. Through the framing section presented in each image, the photographer can control the viewer's gaze. This can reinforce the importance of an element or create a sense of mystery to what lays beyond the frame. In both instances, the photograph creates a tool of reflection one which can be the starting point for greater study and investigation. Gathering, categorizing, and dissecting images can give the designer a better understanding of the essential complexities of our built environment. This process allows the fluid gaze of the viewer to examine and decode countless considerations affecting human experience and the construction realities of architecture. As data is extracted the designer responds to the essential complexities of architecture while also investigating the social, economic, political, and environmental culture of a specific location. These visual practices focus on the designer's ability to extract coded cultural data from

images and use that information to conduct more focused research. Visual analysis through coding images for a given criteria allows architects to create associations that might have been formerly unobserved, and the processing of this information through the mind's eye allows the designer to envision multi-sensory experiences and create architecture that responds to the particularities of its place.

In addition to analog and internal tools, technology is shaping the way architects see and understand the process of design. Diverse technologies are being utilized to examine the spatial and visual complexity of the built environment through gaming and three-dimensional imaging. These alternative virtual approaches to seeing allow for the dialog within the mind's eye to be visualized digitally and shared with others. Like sketching or model making these are tools of communication, and as with any tools each one creates opportunities while having inherent limitations.

To engage with learned digital exploration, educators have used gaming software to demonstrate the multifaceted relationships amongst various components of architecture and its practice. Diverse software including Unreal Engine, Rhinoceros, and Revit, are employed by architecture students to produce digitally interactive environments allowing students to scrutinize a design through iterative examination. Further applications of technology to the design of the built environment include a myriad of expanding tools used for anything from the communication of design ideas to the production of construction documents.

McGonigal (2011) argued that gaming is an innovative learning environment where virtual reality improves spatial cognition and rule orientation. To involve the participant and build awareness naturally, she offers four rules-of-the-game. The first of which is to establish a goal. This gives players a sense of purpose and something for which to strive. The second is to have a set of rules or parameters that motivate players and drive them toward "more creativity and foster strategic thinking." The third rule-of-the-game is to create a real-time feedback system that acts as a "promise to the players that the goal is achievable and provides motivation to keep playing." Finally, the fourth is that participation should be voluntary. Players need to have the freedom to enter or leave a game at will. Thus, autonomy creates a safe and pleasurable environment allowing what are intentionally stressful and challenging elements of the game to remain engaging to players (McGonigal, 2011, p.21). These rules also apply to the framing of design projects assisting architecture students in designing with empathy by allowing them to experience a virtual three-dimensionally constructed environment. This immersive method of design can advance architectural understanding through a more critical examination of prebuilt conditions.

An illustration of gaming being used as an architecture education tool is Disentanglement and Gates, which was created to teach professional practice in architecture. Hall, Pacheco, Dudzik, Cataldi, & Cookson (2013) note that "new technology offers potential to drastically reinvent design education and better prepare students for professional careers"

(p.31). The authors worked with the National Council of Architecture Registration Boards (NCARB) to employ gaming software for an interactive game that addressed the complexity of interconnected decisions made in the professional practice of architecture. The authors state collaborative and competitive aspects allowed students to interact with professionally practicing architects from across the globe. They also noted that the method of gaming allowed them to "further simulate practice settings by factoring in issues such as multi-disciplinary teams, time management, client relations, economic factors, energy use, and international practice" (p.31). Hall et al. explained that the game uses "the concepts of entanglement and gating—key concepts to interactive game design and relevant to architecture practice" (p.32) to discover the union of seemingly disparate decisions. The variety of experiences in the game allows students to make collaborative, interactive, choices based on real-world circumstances and events.

A gaming software employed by architects is *Unreal Engine*. It allows the designer to create a three dimensional computer model of their design which can be animated to allow for virtual walkthroughs of the building, allowing the designer to explore spatial conditions, previously held only in their mind's eye. Realistic movement through a building allows for the architect's hypothetical concepts of progression through space to be further studied. This allows designers to ideate structures that are more considerate of the inhabitants' needs and further tied to the local environmental conditions of a place.

A negative aspect of advanced digital tools is that designers may jump into a complex tool before they have a basic understanding of governing parameters and by doing so either circumvent necessary processes or slow down the advancement of the project. Two and three-dimensional design software generate imaging systems that allow a scheme to look comprehensive while the design may be ill-conceived. The ability of designers to utilize computer software to rapidly generate a three-dimensional model allows students to examine space quickly but is not necessarily conducive to

designing in a socially, environmentally, or culturally responsive manner. Visualization is a powerful tool and once the designer sees the image of a building, that tangible generation of schematic intent may overshadow more thought out attempts of the mind's eye to produce culturally informed designs. Additionally, the programmed constraints of advanced computer-aided design software can lead many students to follow the path of least resistance rather than examine alternative environments that may be more appropriate to the ultimate user or site.

Advanced and emerging technologies are tools, like hand drawing, model making, and cognitive imagination, to envision, examine, and document designs. Without evidence-based design or an understanding of cultural conditions, a designer can too readily rely on digital tools as the guiding force of the project. Instead, the architect should utilize more advanced tools to understand the site, the users, and their culture(s).

CONCLUSION

Cognitive imagination utilizes visual literacy and mind's eye viewing to create an integrated approach to designing for the cultural relevance of the people and places for which a scheme is generated. Combining visual literacy practices with traditional notions of research allows architects and interior students to cultivate the ability to see both cultural realities and to ask vital questions about prevailing societal circumstances. Through this process, architects can decode data held in the image as well as utilize mind's eye processing and cognitive imagination to form meaningful places. This iterative process engages designers in a deep cultural understanding and builds a visual lexicon that aides in actively examining critical cultural issues. By embracing the inherent complexity of social and environmental cultural considerations architects can recognize when paradoxical conditions may be able to build stronger communities.

Through research architects can unpack cultural meaning and create designs that

resonate with the local communities. This process is ultimately about empathy and consideration for the other which can be conducted through both visual and traditional methods of research and inquiry. Architects must progress past their worldview and societal norms to recognize and understand the people for whom they are building. This practice of analysis and investigation can propagate a new appreciation for the *genius loci* — the spirit of place — of a given context.

By making representations of cultural spaces more available the image democratizes information and aides in architectural visual literacy. As the complexity of modern practice escalates, it is vital to holistically scrutinize architecture by balancing emerging tools of production with creativity, innovation, and evidence-based design. To attain this equilibrium intentionality of cultural practice must be impelled. Visual exploration, arguably, offers the most empowering tool for architects to unpack the complex social, economic, and political contexts of design.

Visual exploration allows the viewer to use his/her cognitive imagination — the mechanism through which an individual can process, manipulate, or create spatial data internally — to study the complexities of our built environment. However, visual practice also requires rigorous investigations beyond the visual. These may include technical analysis, interviews, cultural readings, or other methods of data collection.

REFERENCES

- Brolin, B. C. (1976). *The failure of modern architecture*. Macmillan Publishing Co. Inc.
- El Masary, S. (2006, December 12). *Design must fit culture*. Interview by Whitney, M. Virginia Polytechnic University, Blacksburg, VA.
- Hall, G., Pacheco, C., Dudzik, M., Cataldi, L., & Cookson, A. (2013). Disentanglement and gates. *Design Intelligence - Technology Trends and Innovation Survey*, 19(3), 31-35.
- Jani, V. (2011). *Diversity in design: Perspectives from the non-western world*. Fairchild Books.

- Kavakli, M., R., S. S., & Ball, L. J. (1998, October). Structure in idea sketching behavior. *Design Studies*, 19(4) 485–517.
- King, A. (1990). Architecture, capital and the globalization of culture. *Theory, Culture & Society*, 7(2/3), 397-411.
- Kitto, H. D. (1951). *The greeks*. Pelican.
- Koolhaas, R. (1996). Architecture and globalization. In W. Saunders (ed.), *Reflections on architectural practice in the nineties*. Princeton Architectural Press.
- MacPhee, G. (2002). *The architecture of the visible*. Continuum.
- McGinn, C. (2004). *Mindsight*. Harvard University Press.
- McGonigal, J. (2011). *Reality is broken*. The Penguin Press.
- Rapoport, A. (2005). *Culture, architecture and design*. <http://www.lockescience.com>.
- Rodriquez-Camillion, H. (2007, October 28). *Machu Picchu sacred site*. Interview by Whitney, M. Virginia Polytechnic University, Blacksburg, VA.
- Sacks, D. (2008, November 1). *Green guru gone wrong: William McDonough*. <http://www.fastcompany.com>
- Travis, J. (2010). Black culture in interior design --- Hidden in plain view; 10 principles of black space design for creating interiors. In C. Martin, & Guerin, D. (eds), *The state of interior design* (pp. 317-325). Fairchild.
- Venturi, R. (1966). *Complexity and contradiction in architecture*. Museum of Modern Art.
- Wilson, D. (2012). Training the mind's eye: "Brain movies" support comprehension and recall. *The Reading Teacher*, 66(3).
- Winchip, S. M. (2010). *Visual culture in the built environment*. Fairchild.
- Wright, R. M., & Zegarra, A. V. (2001). *The Machu Picchu guidebook*. Johnson Publishing Com.



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