

The Chameleon Playhouse

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Abstract: This paper presents a design and built project for a playhouse in a kindergarten facility. The design process interprets the role of architecture at the service of early childhood education: playing, exploring and learning. If one of the fundamental topics when designing for children concerns the definition of scale, this essay also questions the role of designers in children's detachment from nature. It explores how to design an infrastructure that stimulates children's imaginations in contrast with today's objects that encourage passive play.

The paper describes first children's needs of space and its influence in their behavior when playing and learning. Second, it introduces Aldo Van Eyck's playgrounds in Amsterdam as case study of design encouraging children's imagination and skills while acknowledging the value of the spaces for children in the city. And third it describes the design and built process of the Chameleon Playhouse.

The purpose of this project was to study how to establish a compatibility between design and built, theory and practice, and between nature, learning, and playing. All these, while looking for deep and complex relations that connect interdisciplinary fields related to the making of spaces for children.

Key words: *Playhouse, children, nature, dynamic space, play, learn, build, shelter, scale.*

1. Introduction

The role of nature in the learning process of the children as well as the fact that simple objects can trigger in children's capability to create and imagine seem often forgotten. Richard Louv in his book *The Last Child in the Woods* presents the risk of a new generation detached from nature. (Louv 2006) The importance of outdoor environment is that it provides an unending diversity, optimal stimulation and restoration, an opportunity for exploration and learning.

The Chameleon Playhouse was designed, developed and built during a five week internship with four 3rd year Architecture. We not only intended to revolutionize the state of the art in playhouse systems from the point of view of challenging children's capability to create and imagine, but also the design intended to encourage children to stay in a closer relation with nature. From the economical point of view we had the premise of doing the project with all donated and recyclable materials with zero \$ for a budget. For the safety, liability, structural and early childhood education points of view we worked with a group of volunteer consultants: the vice president of a playground equipment company, a

structural engineer, the Assistant Director of the kindergarten and other early childhood educators.

The goal was to design and build a system that would allow kids to create their own spaces. The Chameleon Playhouse was designed as a self standing structure which would hold a system capable of creating different spaces with movable panels. At the same time, it provided the Architecture students with the experience of learning from all the phases of a project; research, design development, liability issues, structures, and construction.

If my design education as an Architect, Habitat Designer and Urban Planner made me think different about the world, then motherhood made me think different about Design. Were we, designers, responsible for children spending hours indoors plugged in to some modern toy? Were we creating a new generation incapable of problem solving because their immediate context and playing tools did not encourage them to explore? How does current design infrastructure encourage children to discover its use? Were designers acknowledging the value of outdoor play? How we designers were applying everything learnt at School in regards to concepts of proportions, scales, space when designing for children? What can we learn from children's fabrication of "houses", with blankets, chairs, and empty boxes?

The children's physical environment plays an important role in the development of a child, Churchill once said "*you shape your environment, the environment shapes you*".

2.1 A place to play

Play is a dynamic process that develops and changes as it becomes increasingly more varied and complex. It is considered a key facilitator for learning and development across domains, and reflects the social and cultural contexts in which children live (Christie, 2001; Fromberg, 1998, 2002; Hughes, 1999, in press).

For the children to play there is a need of a physical space- the "environment". Children interact with setting, and from that interaction with their environment, the expected outcome is their development. This development can be classified under three big umbrellas: physical, cognitive and socio-emotional. With interaction I refer to the children capability of exploring, testing and learning. Children grow when they interact.

Louise Chawla- a Kentucky State University environmental psychology professor and a tireless advocate for increasing children experience in nature- differentiates three age groups in terms of how children explore physical and social environments:

- 1- The first group includes the toddlers, children between birth and five years old, have limited physical territory. They do some environmental exploration and a sense of self leading to appropriation and possession of things begins. Children these ages have a sense of oneness with the world; the “mine” is part of their perception of the world.
- 2- Age group between 6 and 11 year old. Children these ages explore their environment outside their homes, they have an appreciation of their own space and they tend to have social interaction with kids of the same sex.
- 3- Teenagers between 12-17. This group has an attachment to childhood, specially recreating places of memory. They tend to appreciate their privacy and have a trend for solitude. (Chawla 1994)

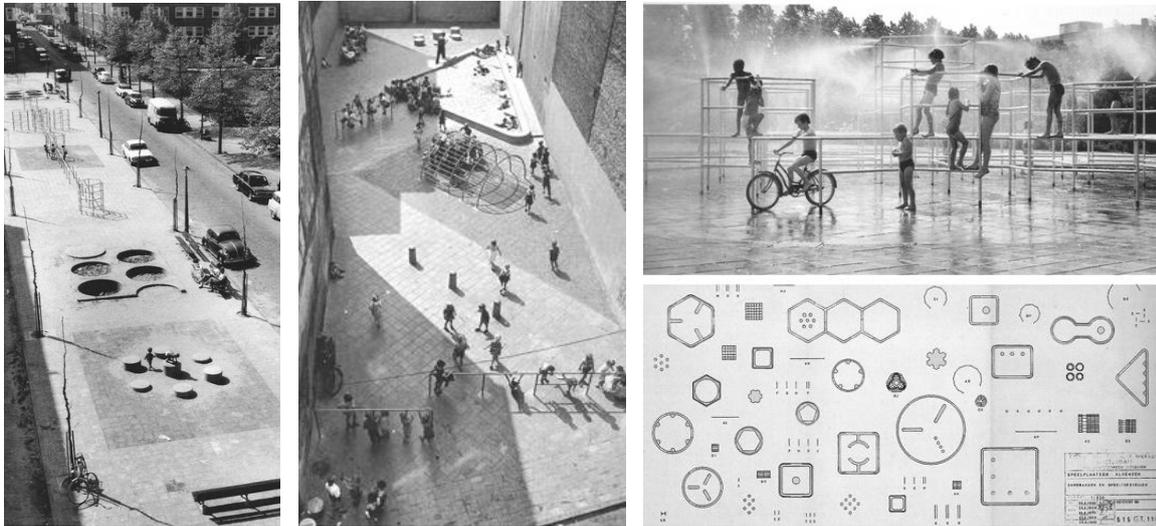
The Chameleon Playhouse was expected to have users between the first age group (3-5), its location was also considered as part of the kindergarten program since it was not only designed with the purpose of play but also with the purpose of learn.

Young children need spaces that afford or provide sense of privacy, control, security, solitude, stimulation, restoration, self expression and social interaction. All these, while at the same time providing organization, complexity and variety. By organization Chawla refers to spatial organizations; they are the pathways, the empty space, the flexibility in the use of the space, an opportunity for self choice, and opportunity for personalization. By complexity, Chawla refers to the settings and props, by providing manipulation, alteration and improvisation of the space. Under these characteristics, they play units that can deal with complexity at three different levels: simple, complex or super. By variety Chawla refers to the props as multiple ways of using one prop. The variety should be given by the places, the things to do and the sensorial stimulation. The choice for places should be both intimate and open. It can be given in the things to do, number of play units divided by the number of children. For the sensorial stimulation the variety should be given by soft and hard materials, lighting plays an important role since it creates varying moods.

2.2 Aldo Van Eyck and the playgrounds

Space is a necessary condition for play. A playful design calls not for play objects but for a design that stimulates children’s imagination. It can assume a variety of forms.

Aldo Van Eyck designed over 700 playgrounds between 1947 and 1978 in Amsterdam and all across Netherland. They were fantastic because the objects were simple: rectangular and round frames for climbing, a sandpit, a group of circular concrete blocks from jumping from one to another- objects that are not anything in themselves, but which have open function and therefore stimulate child's imagination. (Rudi Fuchs in Lefavre and Ingeborg 2002)



Figures 1-4- Aldo Van Eyck's playgrounds in Amsterdam

Van Eyck equated childhood with the ludic, the idea of the 'ludic' city projected by him in the playgrounds was part of the debate of the time. He recognized that architecture, with the works of pioneers like le Corbusier and Rietveld, had originally played a vital part in the construction of that new culture, but considered that their obsession with standardization and industrialization had gradually alienated them from their origin. (Francis Strauven in Lefavre and Ingeborg, 2002) His designs were based on the elementary components of visual language, experimenting with non hierarchical compositions in which different things are related to one another on the basis of equality.

Playground furniture became elementary, archetypal constructions whose powerful simplicity evoked different associations, the demarcation of the territories; the facilitation for different views. Van Eyck would experiment a relation between very different things in a non hierarchical way. 'This relation could assume a variety of forms: a centrifugal movement, a spiral movement, or a mender, and anthropomorphic figure, a different frame of reference at an oblique angle to the existing one, the construction of an intermediate space where different frames of reference meet' (Francis Strauven in Lefavre and Ingeborg, 2002, p 80)

Enric Miralles also identified the importance of designing for the children through a series of playhouses. Although his designs were not based in a composition of primary forms as Van Eyck's, they were unique, often would engage existing trees and far from the known form of a playhouse.



Figures 5-7 Enric Miralles' Playhouses in Germany

3.1 The Chameleon Playhouse

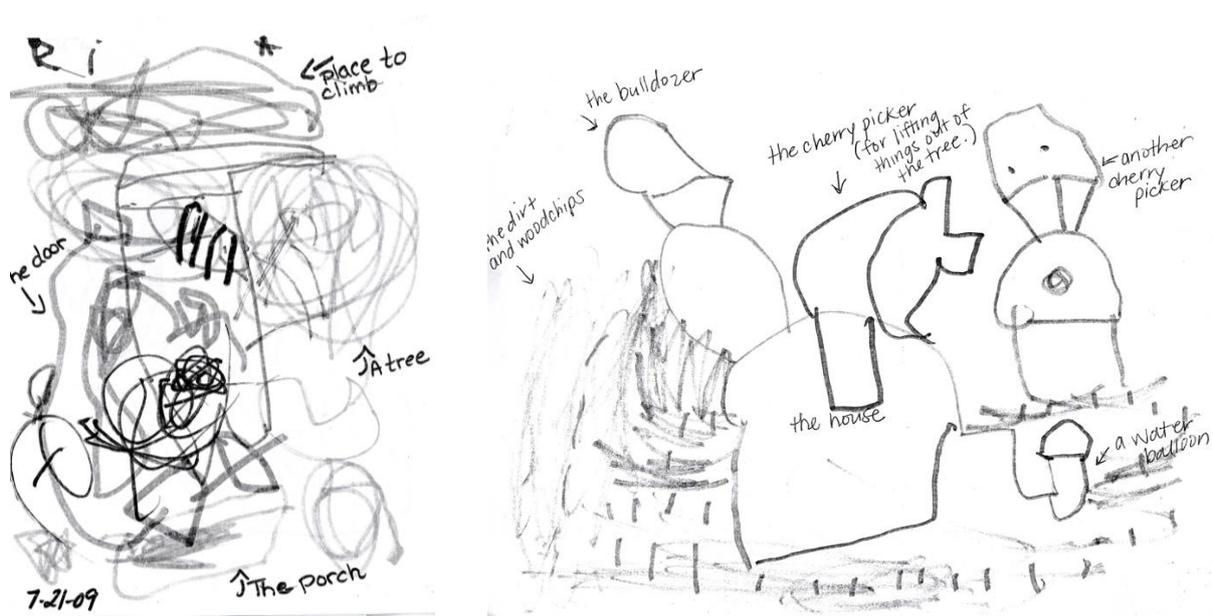
The administrator of the kindergarten has been in search of a building system that would allow the children to create their own spaces for over thirty years without being able to find something with these characteristics in the market: an infrastructure that would allow “the making of hut once it is covered by a rug”.

The need for building shelters applies to adults and children. This theoretical basis for the need of shelter emerged from Heidegger's thoughts about being in the world as dwellers; and it is emphasized by Norberg-Schulz's thoughts about creating places to dwell respecting the genius loci. From the educational point of view, Dewey's thoughts about learning by doing apply to children's experiences when building their shelters.

We first met with the preschool children and asked them to draw how their playhouse would look like. We asked them to include the elements that they thought would be interesting in their playhouse and to draw their favorite spaces. From this exercise our playhouse had to be two stories, it had to have a door and a window, it had to have a stairs, it had to have a place to hide, and most important, children had to be able to inhabit it all together.

We started looking at how the children engaged their body while playing outside, especially when creating a hut using a climber as the structure. We translated all this observation into lines; these lines became the first design proposal which was rather unique and original.

This design process, while successful from the design point of view, uncovered that it was not achieving the learning goals expected. It was sculptural by itself; it was more an object to be observed rather than an object to be explored. Creative learning and thinking were still part of our goals. Furthermore, this form would present many problems for the making of the infrastructure. We continued the observation in children's behavior in the making of the objects, how a box becomes a car, a house, or just another box to stack to build a tower.



Figures 8 and 9 children's drawings of the playhouse

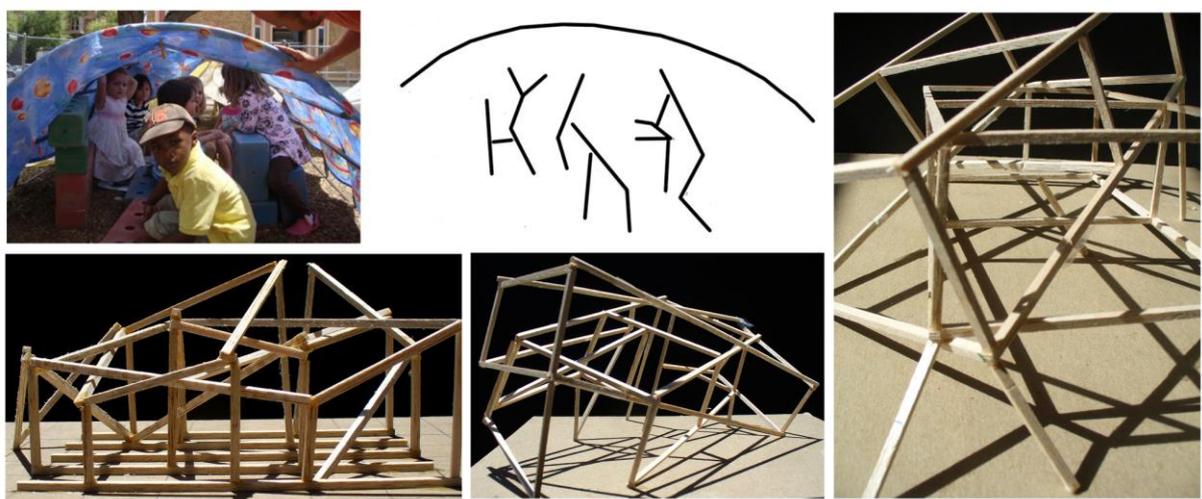


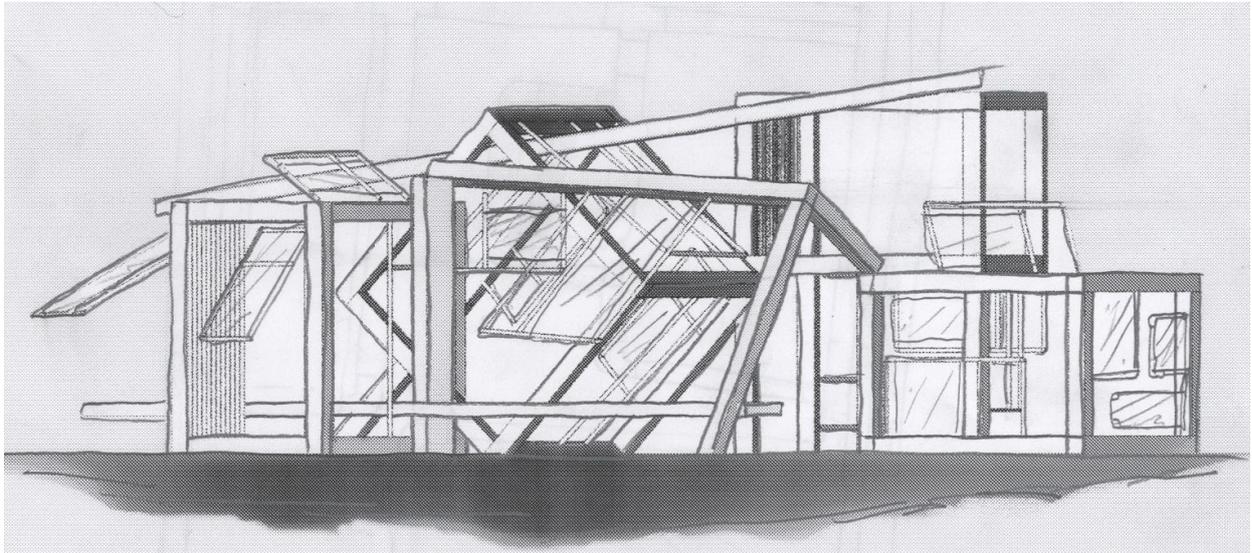
Figure 10-14 Introduction to the design process, first schematic designs for the Chameleon Playhouse

Based in these observations, the approach for Chameleon Playhouse was to design a “skeleton + skin”, a fixed infrastructure which sides could be movable and or removable. This skeleton was influenced by Aldo Van Eyck’s concept to use simple means to arrive at original concepts: it was developed as a sequence of stacked, tilted and interlocked framed cubes designed in such a way that they were the cubes that produced movement. As in Van Eyck’s objects, the cubes do not move, but they allow a child to move with all the imagination he can master. That is the genius of their simplicity. These cubed frames denoted a more abstract and transparent form than if they were to be solid, providing the opportunity to access inside them from all its sides. This compositional organization of the cubes followed Van Eyck’s theory of relativity in which connections between elements were determined by their mutual relationships rather than by a central hierarchical ordering principle. As a result, reality was no longer dominated by a permanent centre. Instead, all elements were equal.



Figure 15- The Chameleon Playhouse site plan

The organized, stacked and tilted frames are organized in the site between the two existing olive trees. A stack of cube frames are resting in a trunk of a tree, giving the sense of the tree house; on the opposite side, a bench that starts inside a cube, ends resting in the other tree. This spatial organization of placing the sequence of frames in the realm of the in-between remade the space into place. A 10’ pipe intercepts all the cubes, starting in the more elevated cube and ending in the opposite side of the playhouse, just above the bench. It transforms the parts into the whole as in the “aha” moment where the new knowledge affirms a new level of coherence between the parts and the whole.



Figures 16 and 17- The Chameleon Playhouse- south elevation.

The Chameleon Playhouse had many design challenges as well as many early childhood education goals to achieve: the site was in between two olive trees, and in between a cement track for tricycles and an existing playground. In all cases we were supposed to have 6' feet setback for safety issues, other challenges included the time frame, the budget and no skilled labor since it would be built by the students. The decision of designing the Chameleon Playhouse with a prime form: a cube would not only encourage children to explore their imagination, but it would solve most of the problem aforementioned.



Figures 18 and 19- The Chameleon Playhouse- Cubes organization

The space between the trees would have been reduced to minimal if the setbacks were to be considered from both trunks. Our safety and liability consultant suggested that if the design could incorporate the trees as part of the playhouse, then the setbacks would not be required since the trees would become part of the “playhouse structure”. Besides solving a safety issue, it gave the opportunity for the design of the Playhouse to transform the space into place while engaging the notion of playing in nature, providing the children the opportunity to be “up in the tree”, “under the canopy of the trees”, or “in between the trees”.



Figures 20-22- The Chameleon Playhouse- Playing in nature

The spatial composition of the cubed frames was designed based in the literature that defines the need in young children to claim their own space. The cubes were organized in such a way that the “in between” spaces generated individual territories in opposition to the space inside the cubes which proportions were for a group of four or five to claim their territory. The spatial organization mentioned earlier defined by Chawla as a

characteristic of a space for children, is achieved through the sequential composition of the cubes, the half-cube defining the transitional space between the playhouse and the existing playground, the bench provides a place that becomes the group territory; the bench can become a balance beam, an object where children can learn skill of balancing since it is detached from the ground but only 12” from it. The spatial organization is also given through the design of the overall “skeleton” which can be accessed throughout all of its sides. The complexity, defined by Chawla as another characteristic of the space is given by the movable PVC panels. They allow the kids to create their own spaces, the structure itself works as a permanent structure from which the children can create more spaces attaching stretch canvas with Velcro in its sides. The variety is given through the quantity and quality of the spaces, individual spaces versus group spaces, in the tree or underneath the tree and by the cubes sides are movable panels that allow the children to build their own spaces, it can be an enclosed, open, semi open space. Special attention was given to the distances between the frames to enable the children to walk through, and walk underneath them, so that they give the opportunity to claim a space and transform the space into place.





Figures 23 and 24- Children's spaces according to Chawla

The Chameleon Playhouse form was different from the “house” form that kids know, a typical playhouse shuts the imagination down rather than activating it. Conversely, the primal elementary forms of the frames have a known character, and stimulate the imagination. A cube or a box is known by the children and that primary shape by itself inspire creativity; and the sequence of cubes combined creating an informal form stimulate exploration. The framed cubes are not tied down to a particular function, but evoke all kinds of use, including unexpected ones. The Playhouse offers children the means of discovering things for themselves: for some children the cube that is stacked on top of another was the “tree house”, while for others it was the “cave underneath”; for some the purpose of the “tree house” was a mean to be closer to the canopy of the tree, to stretch their bodies trying to reach for branches of the tree, for other it was the sense of conquest of the fort, while for other was the mean to interact with the pipe connecting the cubes. This long pipe that connects the “tree house” to another two cubes was designed as a water- play element. Children would climb up the tree house with a bucket of water and would pour the water in the pipe trying to wet another child that was sitting in the bench on the other side of the pipe. The administrators of the kindergarten decided to let the children explore the purpose of the pipe. Since the playhouse itself did not provide water, the children's first explorations were: talking through the pipe, re-discovering gravity throwing elements collected from the ground s chip wood or toys, etc. They then tested and learnt notions of proportion discovering that big objects did not pass through the pipe.

The Chameleon playhouse was designed to foster the development of the imagination and energy of children with certain limits. Lower cubes were designed to fit the younger children and to make it easier for the children to enter. The tilted cube would challenge the kid to reach at both sides stretching their bodies. It would also provide a sense of refuge under the panels and an access for the taller kids. The “tree house” would be resting in the tilted cube, in the lowest cube and in the tree itself in such a way that could create space of its own underneath it and next to the tree, and at the same time it would provide the opportunity to be feel at the scale of the teachers, once in the tree house, children are at the same eye level than the teachers in the ground.

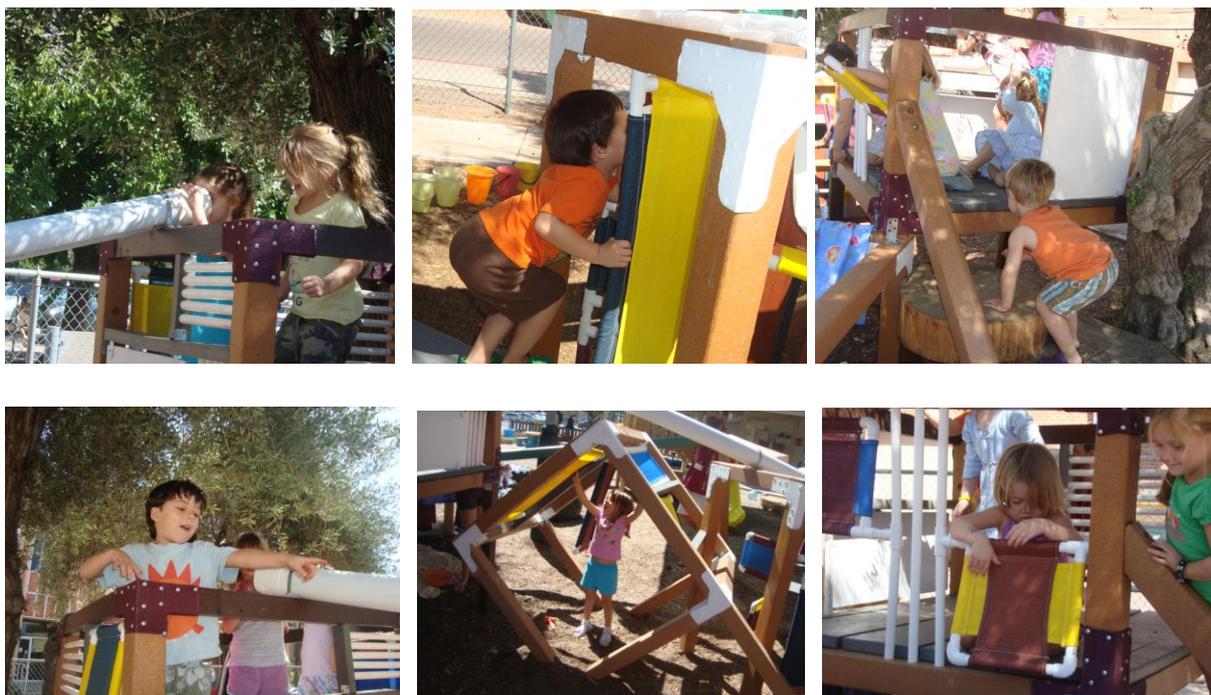


Figure 24-29 Children using the Playhouse

Donated materials were given before we started with the design of the Chameleon playhouse. The proportions of the cubes were not only given by the scale of the child but also by the optimization of the materials. We had the premise to have no waste from the cuts for the framing. Another consideration was that the PVC panels would be standard in such a way that what it would change was the quantity and compositional organization of them depending of the sizes of the sides of the cubes. The frames of the cube were made out of HPDE; a plastic material made from a combination of recycled polyethylene plastics (such as milk plastic bottles) and reclaimed waste wood fiber. HPDE is durable, splint free, low maintenance, it resists UV and salt water damage, and it is can be used by people with common tools and without carpentry experience.



Figures 30 -32- The Chameleon Playhouse- skeleton + skin

The access to the tree house was designed re- using old stumps that were in the site. They were placed in such a way that they would become the “stairs” to the tree house, but also they became the boundary from the space underneath the tree house as well as an object to help the little ones to climb up the tree house.

Following the same concept of the “framing” + the “skin”, the movable panels were a designed as a frame made out of PVC, with stretch canvas covering the frame. The stretch canvas had a multiple functions: on one side it provided the “solid” appearance to the panel, the layer that would provide the child the sense of shelter, it provided the texture and variety of colors to the playhouse and also it would work as a cooling material in the summer. The movable panels with the stretch canvas would be hosed in the summer reducing the high temperatures of Arizona summers. This, combined with the existing shade of the trees in the site would provide the children with a cooler place to play outdoors.

6. Conclusions

Building is a natural activity for children. They build their imaginary worlds and destroy them and build again all the time. During the building process, children also learn in a natural way, by doing. The purpose of this project was to relate the children's need for building with learning and playing. This was achieved through the spatial organization of the frames cubes to one another as unique elements and thereby articulating the given space as a place with an identity of its own; identity that would reflect the principles and methods of the kindergarten. A place in which the space marked out by the things is as important as the things themselves. In Van Eyck's words, "It would be much more better, I believe, that in the design of the playgrounds of the future there be a certain module developed that can be implemented. [...] I think the architect should be left free to experiment, to permit new solutions and evolving possibilities". In this case, the children are the ones left free to experiment.

Designers should consider that their "artifact/ infrastructure" should encourage curiosity and creativity, playground and playhouse environments should allow children to explore, build, climb, hide, and move about; a place that allows children to build a space or place of their own. Such places I simply call huts. The Chameleon Playhouse in its best moments serves to transform both, the children and its structure in a participatory embrace that enact new worlds and creates new boundaries and play spaces. The design for the Chameleon Playhouse brought the primary form of the cubes, and translates them in "play". Before the children would be playing in the playhouse the cubes were playing among them.

These were all important parts of architectural education. Perhaps closest to my heart is the service to the community and the expectation that we are re-connecting children with nature and encouraging them to explore again while providing architecture students the right questions to become better designers.

Acknowledgement

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Figures 31-33- The Chameleon House creators: Allen Avery, Salvatore Cosenza, and Eduardo Santamaria

References

- Louv, R.,(2006) Last Child in the Woods, 1st paperback Ed., Algonquin Books of Chapel Hill.
- Christie, J. (2001). Play as a learning medium. In S. Reifel (Ed.), Theory in context and out (Vol. 3, pp. 358-365). Westport, CT: Ablex.
- Fromberg, D. P. (1998). Play issues in early childhood education. In C. Seefeldt (Ed.), The early childhood curriculum: A review of current research (2nd ed., pp. 190-212). Columbus, OH: Merrill.
- Fromberg, D. P. (2002). Play and meaning in early childhood education. Boston: Allyn & Bacon.
- Hughes, F. (1999). Children, play, and development (3rd ed.). Boston: Allyn & Bacon.
- Hughes, F. (in press). Sensitivity to the social and cultural contexts of the play of young children. In J. P. Isenberg & M. R. Jalongo (Eds.), Major trends and issues in early childhood education: Challenges, controversies, and insights (2nd ed.). New York: Teachers College Press.
- Chawla, L. (1994a) Childhood's changing terrain, *Childhood*, vol4, pp221-233
- Lefaivre, L. and Ingerborg de Roode (2002) Aldo Van Eyck the playground and the city. Stedelijk Museum Amsterdam. Nai Publishers Amsterdam.