Hawaiian Architecture:
Developing Responsible Stewards of Our Land

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May 2012

Submitted towards the fulfillment of the requirements for the Doctor of Architecture Degree.

School of Architecture
University of Hawai‘i

Doctorate Project Committee

A. Spencer Leineweber, Chairperson

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We certify that we have read this Doctorate Project, and that in our opinion, it is satisfactory in scope and quality to fulfill as a Doctorate Project for the degree of Doctorate of Architecture in the School of Architecture at the University of Hawaiʻi at Mānoa.

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ABSTRACT

Ka poʻe kahiko, the ancient Hawaiians recognized the relationship between the natural world and their existence as an integral part of their survival. They perpetuated and exemplified sustainable, ecological, and economical principles of conservation and encouraged those principles into their daily lives. These values also accessed a deep reflection for the type of structures that were built on the land and in the ocean. These traditional Hawaiian buildings are formed from natural laws and conditioned by material properties symbolizing the creative powers of the earth and sky. The intentions of the ka poʻe kahiko was to live with nature by honoring their gods, respecting the land, and developing harmonious relationships amongst themselves.

In this thesis, traditional Hawaiian architecture practices, learning methods, and cultural norms are explored and successful elements identified. These elements and research of the literature are incorporated into a foundation for a Native Hawaiian undergraduate architecture concentration. However, the challenge for current architecture education research is to understand how cultural practices influence students, and in turn, how the understanding of modern design approaches can be used to improve, extend, and promote cultural transformation for the current architecture program. Implementing a relevant process of student reflections, survey, kūpuna interviews and analysis of community-based projects is included to illustrate how Hawaiian architecture education strategies can be effectively integrated into the current program.

<u>DEDICATION</u>

Mahalo Ke Akua

To my parents who raised me from birth,

Hubert Park

and

Frances Alice Kaonohilani Park

They taught me never to give up and be the best that you can be!

To my birth parents,

Dr. (Kahuna Nui) Reverend Edward Iopa Kulani Kealanahele

and

Reverend Marguerite Kuʻuleialoha Kealanahele

They gave me life and the tutus of yester-years.

and

To my spiritual guide,

Mother Earline Jacqueline Francesca Leon

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Hawaiian Language Glossary

Passages in which Hawaiian words are used will be quoted exactly as printed from ʻŌlelo Noʻeau: Hawaiian Proverbs and Poetical Sayings by Mary Kawena Pukui. They offer the reader "a unique opportunity to savor the wisdom, poetic beauty, and earthy humor of these finely crafted expressions. Each new reading offers a deeper layer of meaning and understanding of the essence and origins of traditional Hawaiian values.[1]" Also in keeping proper use of Hawaiian words, an "s" will not be added to Hawaiian terms to signify plurality, which instead must be taken from the context.

Throughout this thesis, the kahakō andʻokina are applied consistently. This researcher's approach is to use the kahakō and ʻokina for words from this researcher's studies in Hawaiian language and words that are new but can be found in the Hawaiian dictionary. In addition, kahakō and ʻokina are not applied to excerpts from texts used throughout this thesis unless the authors themselves used them.

ahupuaʻa	A traditional land division unit, under the control of a sub-chief, which generally extended from the mountains to the sea, including the near shore fisheries.
ʻāina	Land.
Aliʻi	Chief or person of high hereditary rank.
Aliʻi nui	Highest chiefs are associated with the construction and dedication of a *heiau*.
aloha	Love, affection, compassion, sympathy, kindness, grace.
ʻeke	Basket, sack, pocket, and bag.
Hawaiian	People of Hawaiʻi.
heiau	Temple, pre-Christian place of worship.
hoʻola	Life, small piece of tapa.

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[1] Mary Kawena Pukui. *ʻŌlelo Noʻeau: Hawaiian Proverbs and Poetical Sayings.* (Bishop Museum Press. Honolulu, HI: 1983), xi.

'ie   Woven basket.

'ike   To know, see, feel, experience, understand.

imi   To look, hunt, search, seek.

kahuna   Priest, sorcerer or expert in any profession.

kapu   Taboo, sacred, or prohibited.

kauhale   Group of houses comprising a Hawaiian home.

Kanaka Maoli Hawaiian native, indigenous human being, man, person, individual.

konohiki   A land agent or overseer, usually of an *ahupua'a* and its fisheries.

kuleana   Responsibility.

kumu   Teacher, tutor base, foundation.

kupuna   Respected elder or ancestor.

laulima   Cooperation, joint action, group of people working together.

lōkāhi   Unity, agreement, unison, harmony, agreed.

luakini   Large heiau where ruing chiefs prayed and human sacrifices were offered; to

                perform temple work.

maka'āinana The common people, usually farmers and fishers.

mo'olelo   Story, history, tradition or legend.

'ohana   Family, relative.

pule   A prayer or blessing.

ulana   To plaint or weave as with *makaloa, hala*, or *niu*.

wahi pana A celebrated, noted or legendary place.

Resource for Hawaiian words was taken from the Mary Kawena Pukui and Samuel Elbert. *Hawaiian Dictionary.* (University of Hawai'i Press. Honolulu, HI: 1986).

INTRODUCTION
"Hoʻolauna ana"

This research thesis, <u>Hawaiian Architecture: Developing Responsible Stewards of Our Land</u> arose out of this researcher's experiences at the School of Architecture at the University of Hawaiʻi Mānoa campus. Initially, the research began by investigating the ancient Hawaiian ways of teaching, learning, and practicing traditional knowledge. However, upon further examination, this researcher found that the ancient Hawaiian architecture such as the heiau [sacred temple], hale [house], fishponds [loko iʻa], loʻi [irrigated terrace], kauhale [group of houses], and puʻuhonua [place of refuge] had not been included as learning tools from an architectural perspective. The proposal was then revised to recognize and include the ancient Hawaiian architecture typology. By doing so, this thesis seeks to create a curriculum for a Native Hawaiian undergraduate architecture concentration to emerge by building on the ancient Hawaiian architecture structures, traditional knowledge, voices of the past and indigenous values and practices with the current program.

The presence of traditional Hawaiian activities demonstrating cultural traditions and implementing cultural values in the community reinforces a sense of place, pride, and identity. In traditional Hawaiian society, the people were intimately connected to the ʻāina [land] through language, places of learning, and community. The sense of place was based on the dynamics of both land and sea and by demonstrating traditional knowledge, implementing cultural values, and using the language of the kūpuna. This connection fed the very essence of Hawaiians connecting to the land and reinforcing a deep commitment to the community.

Within current architectural education, the need for ancestral representation is key to providing Hawaiian students in the twenty-first century with skills and competencies to become responsible stewards of the land. However, until the program begins to integrate the proposed

Native Hawaiian architecture undergraduate concentration, students of Hawaiian ancestry will continue to struggle to thrive.

There are many traditional and Hawaiian contemporary texts, journals, and books on Hawaiian culture, history, and sources providing perspectives from Native and non-Native Hawaiian scholars. The purpose of this thesis is not to offer the reader a comprehensive overview of Hawaiian culture and history for the last for 2,000 years, according to anthropologists, but instead, provide the reader with some general knowledge of Native Hawaiian cultural practices, relationship with the land, and building structures according to the socio-political and economic organization of a traditional society prior to European contact in 1778.

Therefore, this thesis re-examines the Hawaiian educational system in creative ways by tracing ancestral ways of knowing that goes out of the classroom, on to the ʻāina, and into Hawaiian communities as sites for training, teaching and for applying specific learning skills. This leads to the realization that Hawaiian cultural influences in education ground student learning in a culturally relevant environment that draws from family, community, and ʻāina. Without these relationships, there could be educational gaps for Hawaiian students seeking to internalize cultural values, participate in restoring sacred sites, and draw upon ancestral knowledge and practices to help make learning relevant.

Mokuna ʻEkahi - Chapter One: A Traditional Hawaiian Society

Mokuna ʻEkahi of this thesis establishes the historical framework of a traditional Hawaiian society by presenting a summary of ka poʻe kahiko [the people of old], ka `āina [the land] and kaiāulu [community]. This chapter also provides one of two foundations as a means for forming this research.

Mokuna ʻElua - Chapter Two: Traditional Hawaiian Structures

Mokuna ʻElua is a journey through the Hawaiian structure typology, tectonics and the key elements of the buildings and their relationship to the socio-economic and political aspects of Hawaiian society. These elements capture multiple dimensions of space, time, and placement of various structures on land and in the ocean. This chapter also provides one of two foundations that continue to support and inform this research.

Mokuna ʻEkolu - Chapter Three: Traditional Hawaiian Education

Mokuna ʻEkolu explores and provides an overview of the literature that guided this research and helped this researcher formulate an answer to the research question, "What are the elements that represents a quality Native Hawaiian architecture model of education?" Traditional Hawaiian educational paradigms that are not often achieved elsewhere have allowed Hawaiians to reach higher levels of knowledge and power.[2] This chapter presents the second foundation of the thesis by focusing on and analyzing what elements make up a contemporary Hawaiian architecture model for educational practices and components.

Mokuna ʻEha - Chapter Four: Methodology

The qualitative methodology used for the data analysis is described in Mokuna ʻEha. It is a multi-method approach that begins with data gathering, interviews, and talk story. Also, included is a description of the School of Architecture including an overview of its degree requirements and program.

Mokuna ʻElima – Chapter Five: Data Collection and Analysis

The type data collection and analysis process is described in Mokuna ʻElima. A department-wide student electronic survey, student, and kūpuna interviews were conducted. The survey results are illustrated with graphics reflecting student choices. Overall, the study provided

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[2] Kū Kahakalau. "Kanu o ka Ainia-Native of the Land from Generations Back: A Pedagogy of Hawaiian Liberation." PhD. Dissertation. (The Union Institute and University Graduate College. 2003), 36.

adequate results that support mixing indigenous architecture practices with the current program.

Mokuna ʻEono – Chapter Six: Hawaiian Architectural Education

Mokuna ʻEono includes the Native Hawaiian undergraduate architectural concentration that resulted from blending and extracting input from a traditional society's, architecture typology, and traditional learning methods. In order to design the undergraduate sub-program within the current architecture program, this chapter used a three pronged approach: research, recommended course work, and define the course description in order to develop a cohesive and culturally congruent educational plan for indigenous and non-indigenous student architects. Also, included is an analysis of the critical role of practice in the form of community projects that connect architecture students with the Native Hawaiian and local community.

Mokuna ʻEhiku - Chapter Seven: Findings, Summary and Conclusion

The type of information gathered in Mokuna ʻEhiku recognizes, for the most part, the ancestral bond with the ʻāina, ka poʻe kahiko, and traditional architecture structures that embody the Hawaiian architecture education process. In this final chapter, the approach is to exam the differences in western thought and various strands of indigenous thought in order to further the case that Hawaiian (and other indigenous) ways of relating to the land, in conjunction with the community and traditional architecture structures have the potential to transform architectural education for Native Hawaiians.

Significance of the Study

Since the resurgence of Hawaiian Renaissance in the 1970's, a rebirth of traditional architecture structures are being built, restored and refurbished to perpetuate and practice traditional construction methods relevant to Hawaiian culture. These practices offer the community and students the opportunity to gain practical experiences as they work alongside

cultural practitioners. For Hawaiians, the presence of traditional Hawaiian activities, usefulness of information and practicality of implementing cultural values is what establish knowledge. Once the teachings are taught, learned, practiced, and committed to memory, the search for importance is answered. An important part of this exploration is the educational process that inspires, motivates, and supports cultural identity and fosters valuable practices for Hawaiian students at the School of Architecture.

Research Questions

The overall research question guiding this study is:

1) *What are the elements that make up a quality Native Hawaiian undergraduate architecture model in education?*

This question deals with the epistemological underpinnings of how Native Hawaiians experience architecture. It seeks to identity the elements attached to traditional architecture structures and learning, to develop a Native Hawaiian undergraduate architecture model for education.

2) *What processes and practices constitute Native education at the School of Architecture?*

This thesis also addresses how the School of Architecture constructs a culturally-centered educational experience for student participants and how do Native Hawaiian students understand their experiences at the School of Architecture.

3) *How does this understanding influence architecture student to engage with their community, in turn, influence their higher educational experiences and professional opportunities?*

This is difficult question because it is a how to question. Within the current program, this researcher attempts to uncover how this understanding affects higher educational experiences and professional aspirations.

In sum, the three questions are posed to help assist the current program understand the dynamic relationship between implementing a Native Hawaiian undergraduate architecture concentration and its influences toward a professional degree, especially for Native Hawaiians.

Weaving a Basket of Cultural Knowledge

The Hawaiian ideas about family, community, and place are like the strong branches of the hala tree that come together to make up a strong and beautiful basket. Each lau hala [leaves] is substantially important and vibrant in its right; but when woven together creates a container to hold many special gifts. It is for the passion, expertise, and talent the master weavers have that is just as important as selecting the branches from the hala tree and not the ground.

The hale tree is a very important tree to the Hawaiian people. Distinctive looking and growing up to twenty feet tall with very thick aerial roots that spread out above the ground, they used the leaves for hats, mats, and roofing materials while the segments of the fruit were used for paint brushes and food. The wood of the hala tree was used to create water pipes, posts, and calabashes. Also, there are male and female versions of the hala tree. The pollen of the sweet smelling male hala flower, called the Hinano was used by the people to preserve feathers and leis (See Figure 1).

They picked the long thorny leaves from the tree and soaked the hala in the ocean to make it pliable. Then, each branch was placed on a device to strip the thorny sides of the hala. Hung to dry, each lau hala is then rolled in a circle and ready for weaving. What is important for each branch is to work together with each other for the benefit of creating a special basket that is strong, flexible, and withstands the weight of knowledge without wavering. It is the intentions of

this researcher to select the branches of knowledge from scholars of today and yesterday to bring them together creating a cultural basket filled with a new vision for a Hawaiian architecture educational curriculum.

Figure 1. Hala tree, fruit, and root system.[3]

MOKUNA ʻEKAHI:
CHAPTER 1
A TRADITIONAL HAWAIIAN SOCIETY

Hoʻomākaukau o ka ʻie
"Make ready the basket"

1.1.1 Introduction

In olden days, the Hawaiian people were intimately connected to the ʻāina through language, cultural structures, and community activities. They exchanged products such as taro, sweet potato, and other foods from the upland with friends and relatives from the seashore who gave them fish or other seafood. Their connection to place is based on the dynamics of land, sea and everything in-between.

According to notable early Hawaiian historians, the cultural landscape of Hawaiʻi is best described as abundant lands with dignified structures.[4] Not only did Hawaiians have the advantage of living prior to 1819, but they were people who understood all aspects of their culture -politically, socially, economically, and spiritually. Their written stories contribute to the body of work by connecting people to the ʻāina, community, and place. Therefore, in this chapter, a general discussion of the people, land, and building typology follows with an emphasis on how traditional architecture progressed in ancient Hawaiʻi.

1.1.2 The Kumulipo: The Creation Chant

In the beginning and during ancient times, Hawaiian tradition was filled with stories of creation and heroes of long ago. The Kumulipo, a 2,000 line creation chant is critically important to the Hawaiian people. The chant described not only the creation of the Hawaiian world but also

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[4] Some texts on Hawaiian history, culture, and politics include Hawaiian Antiquities (David Malo), Tales and Traditions of the People of Old, Works of the People of Old (all by Samuel Kamakau), and Fragments of Hawaiian History by John Papa ʻĪʻī.

their worldview and connection to the universe and the ancestry of Hawaiians.[5]

The Native Hawaiian people describe Hawai'i as their birthplace.[6] This is written in the great cosmogonic myth that recounts the creation of the world from the primal, chaotic darkness, - Pō until the start of human beings. In this particular story, Papahānaumoku [Mother Earth] and Wākea [Father Sky] are responsible for creating the Hawaiian Islands. The first verse focuses on the beginning of the universe:

In the Beginning

O ke au i kahuli wela ka honua
At the time when the earth became hot
O ke au i kahuli lole kalani
At the time when the heavens turned about
O ke au i kuku'iaka ka la
At the time when the sun darkened
E ho'omalamalama i ka malama
To cause the moon to shine
O ke au i Makali'i ka po
The time of the rise of Pleiades
O ka Walewale ho'okumu honua ia
The slime, this was the source of the land
O ke kumu o ka lipo
The source of the darkness that made darkness
O ke kumu a ka Po i po ai
The source of the night that made night
O ka lipolipo, o ka lipolipo
The intense darkness, the deep darkness
O ka lipo o ka La, oka lipo o ka Po
Darkness of the sun, darkness of night
Po wale ho-i
Nothing but night[7]

This verse of the Hawaiian creation chant is critically important to the Hawaiian people because not only does it describe creation of the Hawaiian domain but it conveys their identity

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[5] Queen Liliu'okalani. *The Kumulipo*. (Pueo Press, Honolulu, HI: 1978), 6-8.
[6] Erin K. Wright. "Education for the Nation: Forging Indigenous Hawaiian Identity in Higher Education." PhD. Dissertation. (University of Hawai'i. Honolulu, HI: 2003), 13-5.
[7] The Kumulipo is a 2,000 line cosmogonic genealogy that tells of the creation of the world from *Kumulipo,* the deep dark source. Night and day are treated from this emerge the ocean, the land, the gods, and finally humans.

and their natural world.[8] As seen in Figure 2, Hawaiian society in the physical and spiritual

worlds was viewed as a series of belts or levels reaching out from themselves and their islands to

the heavens above. In their chants, Hawaiians named the levels in the sky above, and within the

earth beneath. Malo named the nine levels of the sky above a man's head, reaching higher and

higher into the dome of the heaven. These levels include: 1)luna aʻe, 2) luna aku, 3) luna loa aku,

4) luna lilo aku, 5) luna lilo loa, 6) luna o kea ao, 7) kea o ulu, 8) ka lani uli, and 9) ka lani paʻa[9]

(See Figure 2). This is where the Hawaiian Supreme God, Akua Manaloa O Hawaiʻi, resided

beyond the clouds, sun, moon, and stars.[10] This is how the Hawaiian people defined themselves

and legitimized their social and religious society in the present by linking themselves to the past.

1.1.3 Ka Poʻe Kahiko: The People of Old

Hawaiian tradition is complete with stories of creation and daily activities of Hawaiian

life especially focusing on the spiritual and religious aspects of an ancient Hawaiian society.

There were different periods in the settlement of Native Hawaiians where a strong hierarchical

system emerged. From the Colonization Phase (0-600 A.D.), the initial wave of migration and

settlement came from the South Pacific. Ka poʻe kahiko survived long canoe voyages and

brought with them plants, domestic animals, arts and crafts, and their traditional oral histories of

events.   During the Developmental Phase (600-1100 A.D.), early Hawaiian settlement patterns

emerged along with their spiritual beliefs, land management practices, and ancient architecture

provided the physical structures required to perpetuate ancient Hawaiian culture.[11]

In this traditional society, Hawaiians were well connected to the land where one finds life

and nourishment. The Hawaiian economic system centered upon agricultural production and

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[8] Lilikalā Kameʻeleihiwa. *Native Land and Foreign Desires: Pehea lā e Pono ai?* (Bishop Museum Press. Honolulu, HI: 1992), 2.
[9] Michael Kioni Dudley. *A Hawaiian Nation I: Man, Gods, and Nature.* (Nā Kāne O Ka Malo Press, Waipahu, HI: 1990), 9.
[10] Edward I. Kealanahele. "Pohihihi." (Unpublished journal. Honolulu, HI.), 1.
[11]. Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* (University of Hawaiʻi Press. Honolulu, HI: 1985), 299-308.

land-use was linked to a tiered system of land divisions. The land ownership was communal that was shared and used for self-sustaining agriculture and gathering. [12]   The konohiki [land stewards] managed the land but the distribution and contributions of the food and other materials were attended by the makaʻāinana [commoners]. The control of the ahupuaʻa was left to the Aliʻi.[13] Unlike European and western feudalism, the Hawaiian people were not bound to the land but free to travel between and within the boundaries of the ahupuaʻa.

In ancient times, the Hawaiian moku [island] were divided in large districts called mokuoloko [island divisions]. In Figure 3, the ahupuaʻa [ahu (altar), puaʻa (pig)] was a smaller political subdivision used for taxation or sharing crops with the Aliʻi.[14] Usually these land divisions extended from the mountain, across agricultural lands and to the ocean. The makaʻāinana who were structured on the basis of extended families and households was dispersed over the landscape. They farmed the land, valleys and slopes and harvested the resources of the reef and ocean.[15] This intense labor force facilitated the distribution of economic products such as taro, sweet potato, and dried fish. As an example, the farmers who lived near their taro patches exchanged their goods with fishermen living near the ocean to satisfy each other's needs. This system acknowledged the distribution and collection of resources that were carefully managed. In addition, the satisfaction of this economic structure led to the preparation for the four-month long makahiki [annual harvest festival] and tribute to the god, Lonomakahiki. This hoʻokupu or ceremonial gift giving was a sign of respect and honor bestowed upon a chief.

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[12] Erin K. Wright. "Education for the Nation: Forging Indigenous Hawaiian Identity in Higher Education." PhD. Dissertation. (University of Hawaiʻi. Honolulu, HI: 2003), 15-6.

[13] Marshall D. Sahlins. *Social Stratification in Polynesia.* (University of Washington Press. Seattle, WA: 1958), 14-6.

[14] Luciano Minerbi. "Indigenous Management Models and Protection of the Ahupuaʻa." Article presented at the Third Conference of the European Society of Oceanists: "Pacific Peoples in the Pacific Century: Society, Culture, Nature" held at the National Museum of Denmark and the Institute of Anthropology at the University of Copenhagen in Copenhagen, Denmark. (December 13-15, 1996), 2.

[15] Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* (University of Hawaiʻi Press. Honolulu, HI: 1985), 6-8.

Malo said that all Hawaiian people descended from the same ancestors except that the Aliʻi [chiefs] knew their genealogies that defined them from the makaʻāinana.[16]   According to Figure 4, they ranked and graded themselves into a hierarchical system topped by the paramount chief of the island or district, the Aliʻi ʻai moku [the district eating chief] and other ranking chiefs and land managers that ruled over the large class of commoners. This was a constant theme throughout the Hawaiian society where the Aliʻi were god-like leaders who manifested their relationship between the spiritual world and the human world. The cultural and spiritual values were an integral part of the mythological, legendary, and traditional stories passed down from generation to generation. In *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory,* Kirch provided this story. He stated that Kamehameha the Great was born during the appearance of Halley's Comet. The elders claimed this hōʻailona [omen] forecasted an exceptional destiny for this child. As such, Kamehameha I [the Lonely One] (1758-1819) established the kingdom of Hawaiʻi by uniting all of the islands under his rule. He was the most powerful of the Hawaiian Island chiefs and fondly remembered by many as a wise and noble leader. This single-handed unification by Kamehameha formed the early government of the Hawaiian Kingdom.[17]

Another example that helped Kamehameha I guide his people in the kingdom was establishing the kapu system.   Malo, Kamakau and ʻĪʻī explained the kapu system was established to outline the code of conduct, law and rules and regulations. The strategy was to impose this system for appropriate and inappropriate behavior for all the people in every class. The most powerful was the Aliʻi who had the power of life and death.   Sahlins states the difference in the power of ranks was to enforce punishment on those who abused the resources

[16] David Malo. *Hawaiian Antiquities: Moʻolelo Hawaiʻi.* Translated by Dr. Nathaniel B. Emerson 1898. Bernice Pauahi Bishop Museum, Special Publication 2, Second Edition. (Bishop Museum Press, Honolulu, HI: 1951), 53-4.
[17] Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* (University of Hawaiʻi Press. Honolulu, HI: 1985), 236.

especially when conserving the food supply against times of famine.[18] A good and compassionate chief who respected the religious ceremonies of the gods and worshipped accordingly, was able to successfully conduct his government with kindness. His people would then continue to practice responsible stewardship assuring ample food for the community. This was one way for a chief to prolong his reign and keep it perpetuated.   Another example is the kapu akua [law of the gods] that was superior to the kapu of a chief and at the same time, a chief could impose clemency, mercy, pardon, or absolution to a violator. This law was imposed only on very sacred sites for anyone marked for death could be saved from capital punishment if they entered this place, the puʻuhonua (See 2.1.7).

In Hawaiian religion, ancestral deities and spirits were honored at a variety of levels.[19] The commoners participated in agricultural rituals that were sponsored by chiefs and priests of Lono, the principle deity of fertility. During the annual harvest cycle, the Makahiki displayed ritual protocols for the collection of taxes by an Aliʻi and celebrated a time for hula and traditional competitive games.[20] One of the largest and most impressive rituals was dedicated to Kūkaʻilimoku, the god of war and conquest. These ceremonies were performed by the kahuna [priest] on the luakini [temple] before publicizing wars of invasion.   As experts in their field, the Aliʻi recognized the kahuna as their political and spiritual advisors. Some were masters of carving, navigation, architecture, canoe builders, chants, and hula. Developing this system required greater organization that resulted in the emergence of this hierarchical system. The following chapter outlines the architecture typology built on the landscape reflecting the social, political, economic, and spiritual aspects of ka poʻe kahiko and the ancient Hawaiian society.

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[18] Marshall D. Sahlins. *Social Stratification in Polynesia.* (University of Washington Press. Seattle, WA: 1958), 6-8.
[19] Samuel M. Kamakau: *Ka Poʻe Kahiko: The People of Old.* Translated from the Newspaper Ke Au ʻOkoʻa by Mary Kawena Pukui. (Bishop Museum Press. Honolulu, HI: 1991), 13-7.
[20] Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* (University of Hawaiʻi Press. Honolulu, HI: 1985), 7.

Figure 2. The Hawaiian view of the universe.[21]

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[21] Michael Kioni Dudley. *A Hawaiian Nation I: Man, Gods, and Nature.* (Nā Kāne O Ka Malo Press, Waipahu, HI: 1990), 9.

Figure 3. Ahupuaʻa.[22]

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[22] A traditional ahupuaʻa, land division in ancient Hawaiʻi. Taken from website:
http://www.pacificworlds.com Access: March 2, 2012.

DEITIES

△

mediation

ALI'I 'AI MOKU

Kalaimoku, Kuhina, Kahuna Nui

| ali'i 'ai ahupua'a | ali'i 'ai ahupua'a | ali'i 'ai ahupua'a |

| konohiki | konohiki | konohiki |

maka'āinana

Figure 4. Hawaiian society at European contact was hierarchically organized.[23]

[23] Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* (University of Hawai'i Press. Honolulu, HI: 1985), 6.

MOKUNA ʻELUA:

CHAPTER 2

TRADITIONAL HAWAIIAN STRUCTURES

Ka hōʻomoʻomoʻana i ka ʻie
"Shaping the Basket"

2.1.1 Introduction

In ancient Hawaiʻi the social establishments determined the organization of the natural

world and built form on the landscape. From the Marquesan Islands, ka poʻe kahiko brought with

them architectural traditions in which their architecture is embedded. The early mounds or

platforms and roof originated in the Marquesan Islands[24] (See Figure 5). From these origins of

specific building types, ka poʻe kahiko developed a new set of cultural traditions and buildings

for themselves and their gods. The residence or house type was used for cooking, storage, and

arts and crafts. It also served as sacred and ceremonial purposes that led to various styles of

buildings constructed for cultural purposes. The most important influence on this chapter is the

typology of structures that were purposefully built on the ahupuaʻa [land division] with an

emphasis on how traditional architecture progressed in ancient Hawaiʻi. Today, these structures

are looked upon as the ancient Hawaiian's highest architectural achievements.

2.1.2 Hawaiian architecture typology

The strong hierarchical system developed from distinctive divine heritage through

genealogical connection of the chief. These high chiefs influenced the evolution of architectural

types. For example, the monumental temple constructions were built on massive stone platforms

that exhibited the power and authority of ruling chiefs. These structures served as reminders of

the chiefly roles in the ancient Hawaiian society. During the 1780's, visiting European visitors,

provided detailed descriptions of ancient Hawaiian ritual and daily life. These illustrations

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[24] Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* (University of Hawaiʻi Press. Honolulu, HI: 1985), 64.
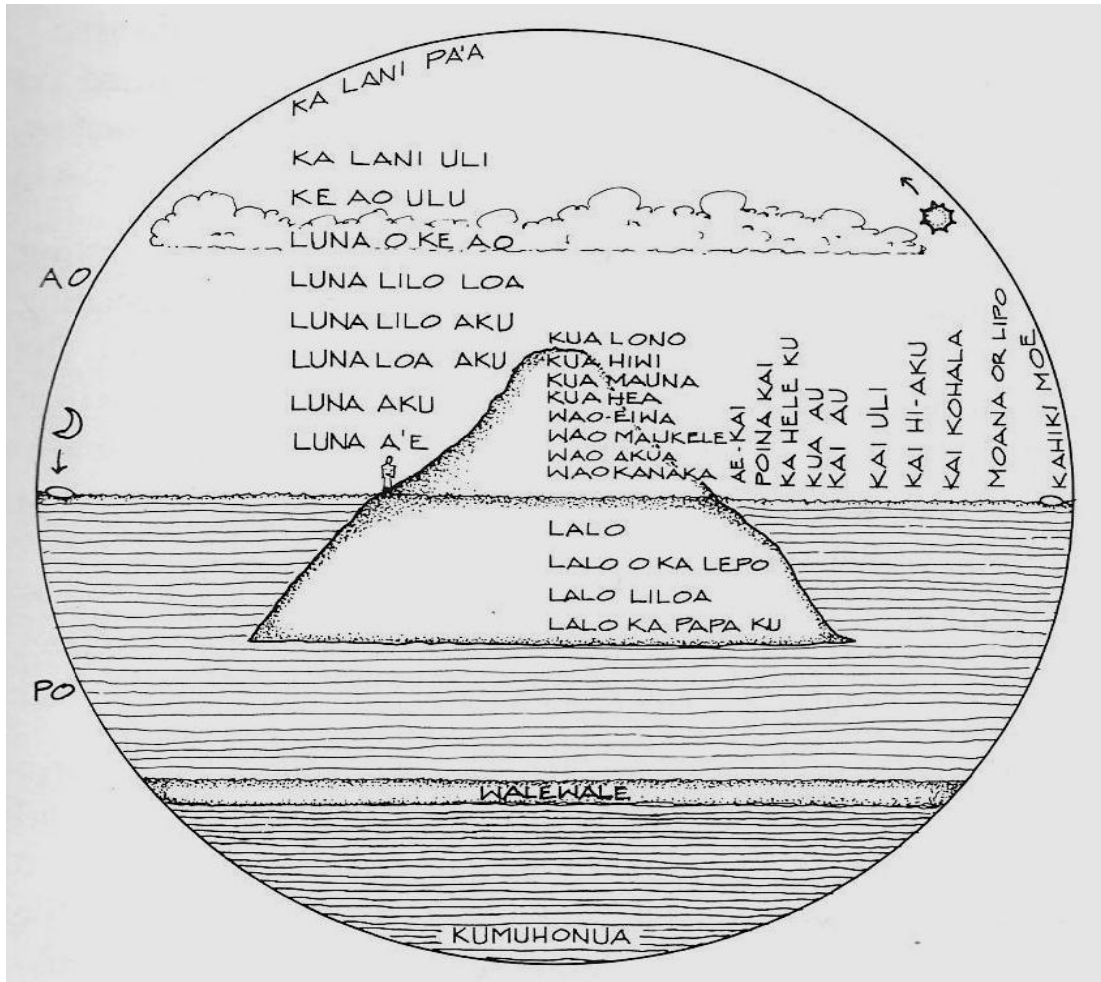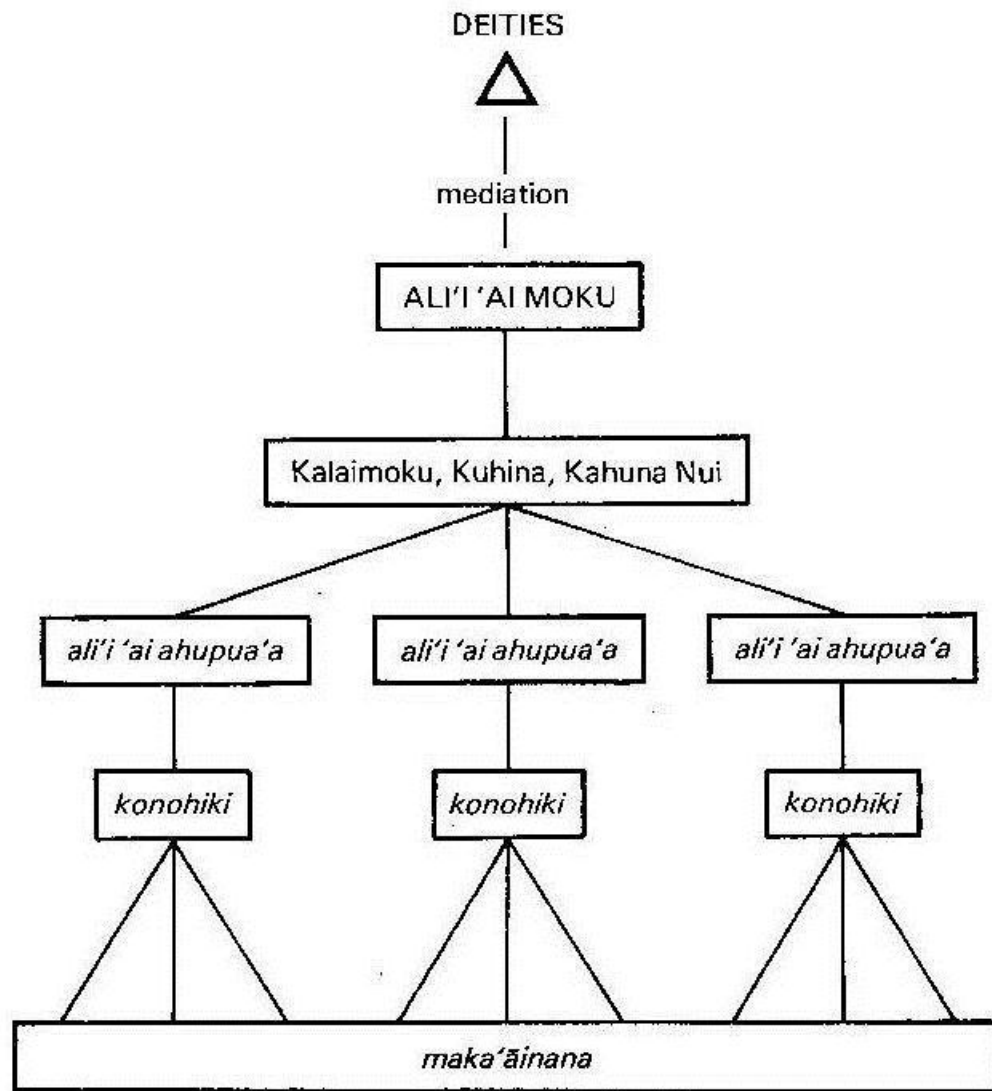
provided the type of structures that were built for an ancient Hawaiian society.[25]   Some of these

descriptions of architectural types include the ancient kauhale [house], the hale [house], heiau

[temples], subsistence structures such as the loʻi fields [irrigated terraces], loko iʻa [fish ponds],

and puʻuhonua [place of refuge].

The Colonization Phase (0-600 A.D.) brought about the most significant architectural

type, the temple structures. These were usually located at the edge between the low laying

cultivated lands and the higher forest area. The ka poʻe kahiko worshipped a variety of gods at

different kinds of sacred sites. These sites comprised of family shrines and various sorts of

temples such as agriculture or war. The pule kahuna or prayer priests with a paramount chief

stood on the temple tower and was elevated to within hearing distance of the gods. As the culture

evolved, so did the kahuna architect, the designers of temple sites and chief residences. They

performed religious ceremonies for the benefit of society while the men of household families

performed daily rituals at the men's house on family compounds.

2.1.3 The Hale

The hale or house was one of the most important means of securing the well-being of a

family, friends, and guests.[26] They provided the family shelter from the sun, rain, and cold as

well as providing storage for their crafts and clothing (See Figure 6). Caves, holes in the ground,

and overhanging cliffs were also used as dwelling places and residences in the hollow of a tree

(See Figure 7).

Before travelling to the mountains to select the trees and natural fibers for their house, the

family offered prayers to their ʻaumākua [family deity] for protection and thanksgiving. They

used the natural fibers and available timber from the forest of the ahupuaʻa to build their hale.

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[25] Margaret L. Berman. "Towards a Cultural Architecture: Inquiries into Hawaiian Architecture Prior to 1778." MA thesis. (University of Washington, WA: 1994), 43.

[26] David Malo. *Hawaiian Antiquities: Moʻolelo Hawaiʻi.* Translated by Dr. Nathaniel B. Emerson 1898. Bernice Pauahi Bishop Museum, Special Publication 2, Second Edition. (Bishop Museum Press, Honolulu, HI: 1951), 118.

Table 1explains the Hawaiian terminology given for the different parts of the house, its purpose, and similarities to the western terminology. The framing and fastening elements used in a Hawaiian hale were pieces of wood joined together and fastened by natural fibers used for lashing or wood that was drilled through the end with a human bone. Table 2 lists the elements of the Hawaiian hale mortise and tenon joinery that allow builders to insert and drive wooden pegs into the holes as seen in Figure 8. On the completion of the door frame and installing the fence around the house and grounds, a kahuna pule was sent for to offer the prayer at the ceremony of trimming the thatch over the door. It was also customary for kahuna pule to recite the pule kuwa [prayer chant] and upon completion, the owner entered his house and occupied it without any commotion. The following was chanted:

Ku lalani ka pule a Keoloalu I ke akua.	Orderly and harmonious is the prayer of the multitude to God.
O Kuwa wahia I ke piko o ka hale o Mea	Kuwa cuts now the piko of the house of Mea
A ku! A wa! Amoku ka piko!	He stands! He cuts! The thatch is cut!
A moku, a moku iho la!	It is cut! Lo it is cut![27]

However, for those who belonged to the Ali'i class, many special houses were built for different members of the family such as the children and his wife. These were houses devoted to various kinds of work such as arts and crafts for his wife, storage, and a halau wa'a or canoe house. The Ali'i also looked at decorating everything in good style with bowls, dishes, and platters of different woods including a net to carry or hold different foods.

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[27] David Malo. *Hawaiian Antiquities.* (Bishop Museum Press. Honolulu, HI: 1951), 125.

a. Roof on ground, straight rafters; ridge 4'- to 6' high.
b. Roof on ground, curved rafters; ridge 4'- to 6' high.
c. Walled house, straight rafters, ridge 8'- to 22' above ground.
d. Walled house, curved rafters, ridge 8' to 22' above ground.

Figure 5. Pre-contact hale dwellings.[28]

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[28] Russell A. Apple. *Hawaiian Thatched House*. (United States Department of Interior: National Park Service, San Francisco, CA. 1971), 18.

Side View

End View

Figure 6. Pre-contact hale with rock wall.[29]

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[29] Edmund J. Ladd. *Ki'ilae Village.* (National Parker Service, San Francisco, CA 1935-1984), 46.

The Cave Kalahuipua'a, Hawai'i

Figure 7. Caves as residential shelters.[30]

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[30] Patrick V. Kirch. "Marine Exploitation in Prehistoric Hawai'i, Archaeological Investigations at Kalahuipua'a, Hawai'i Island." *Pacific Anthropological Records No. 19,* Department of Anthropology. (Bernice Pauahi Museum, Honolulu, HI. 1979),113.

Figure 8. The hale structural system[31]and lashing techniques.[32]

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[31] David Malo. *Hawaiian Antiquities.* Translated by Nathaniel B. Emerson. Bernice P. Bishop Museum Special Publication 2 Second Edition. (Bishop Museum Press. Honolulu, HI: 1951), 119.

Table1. Elements of the Hawaiian Hale[33]

Hawaiian Terminology	Purpose	Western Terminology
Pou-hana	Tallest posts; length is the same as their height	Vertical ridge posts
Pou-kihi	Corner posts	Corner posts
Kukuna or pou kukuna	Shorter side columns	Wall studs
Kau paku	Horizontal ridge beam	Horizontal ridge beam
Oa	Joining rafters	Rafters
Kuu-iole	Lashed pole on top of the ridge beam	Truss spacing
'Aho-pueo	Main thatched purlins lashed together	Stud framing
'Aho	Thatched rafters at shorter intervals	Purlins
'Aho-kele	Horizontal thatched purlins	Wall framing
'Aho-hui	Vertical thatched purlins	Wall studs
Kauhuhu	Horizontal Ridge pole	Horizontal ridge pole
Kahua	Stone platform	Foundation
I'lio	Tie beam in a house	Spandrel
Holo	Diagonal braces	Diagonal support on wall framing

[32] Herbert Kane. *Ancient Hawai'i/Words and Images.* (Kawainui Press. Capt. Cook, HI: 1997), 56.
[33] David Malo. *Hawaiian Antiquities: Mo'olelo Hawai'i.* Translated by Dr. Nathaniel B. Emerson 1898. Bernice Pauahi Bishop Museum, Special Publication 2, Second Edition. (Bishop Museum Press, Honolulu, HI: 1951), 118-124.

Table2. Elements of the Hawaiian Hale Mortise and Tenon Joinery[34]

Hawaiian Terminology	Purpose	Western Terminology
Pou	Vertical posts on the side of the house	Vertical columns
Pou-kihi	Corner posts	Corner posts
Kukuna or pou kukuna	Shorter side columns	Wall studs
Kau paku	Horizontal ridge beam	Horizontal ridge beam
Oa	Joining rafters	Rafters
Lohe lau	Wall and gable plates in a house	House plates in a wall
Kau paku	Ridge beam	Ridge beam
Kohe	Groove or fork at the lower end of the house	Rafters
Ule	Pointed end of a post entering the crotch of a rather	Roof framing
Auwae	Notch below the outer side of a post below the base of the tenon	Side wall posts
Alo	Front of the house	Entry
Kua	Back of the house	Rear
Kala hale	Gable post	Column
Puka hale	Doorway in the middle of the house and in front	Main entrance
Uʻukumai puka hale	Smaller doorway to the rear and opposite the front	Back door
Hale kea	Upright posts that support the ridge pole	Column

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[34] David Malo. *Hawaiian Antiquities: Moʻolelo Hawaiʻi.* Translated by Dr. Nathaniel B. Emerson 1898. Bernice Pauahi Bishop Museum, Special Publication 2, Second Edition. (Bishop Museum Press, Honolulu, HI: 1951), 118-124.

2.1.4 Kauhale

The kauhale was a set of permanent shelters dedicated for people to live in but also served different purposes as seen in Table 3. These spaces were arranged in a flexible pattern depending upon the topography, availability of water, prevailing winds, mauka-makai orientation and separating family spaces. The individual structures acted as the rooms of the house, but were connected instead by open areas instead of covered walkways. The family usually occupied one or two hale, but the chiefly compounds had clusters of several structures including one or more sleeping houses, a men's house and women's eating house, a store house, temple, and canoe shed as displayed in Figure 9.

During the Colonization Phase and Founding Phase, early houses had two roof types: curved and rested on the ground or elevated on posts. These simple framed structures consisted with no more than a curved or gabled room where rafters rested on the ground. These were for the commoners who spent little or no time in their small houses. They used these houses for storage and sleeping during inclement weather.

A wealthy family or respectable household of good character might include: the men's house, family temple, cooking shed, men's work shed, and women's eating house and work shed, and menstruation house. In addition, to the chief's compound, there was a conference house, an apparel storage house and tribute storage house for conferences.

Table 3: Different Hale and Their Functions[35]

Hale ʻaina	Women and children's eating house.
Hale noa/Hale moe	Common house, shared by men, women and children for sleeping. There was no gender kapu. Largest of all structures, built on paepae which extended in front (lanai). Only work permitted was plaiting of lau hala.
Hale mua	Men's house. Located near hale noa and in proximity to imu. Men kept tools and materials for took making, carving, fishing, lashings. Prior to fishing battles, or rituals, men would sleep there the night before. Kuahu (kuaʻahu) or shrine to ʻaumākua (ancestral gods) located there.
Hale kuku or kuʻa	House where women di work such as beating kapa.
Hala waʻa	House for canoe storage, building and repair, fishnet drying, woodworking, workshop.
Halau hula	Structure for instruction of hula, contained kuahu [shrine] to hula goddesses.
Hale kāhumu, hale imu	Cooking house. A simple thatched structure, lean-to or with stone walls, protecting imu and people during bad weather.
Hale papaʻa	Storehouse for equipment or crops, used by chiefs and inland dwellers
Hale hau	The hut was made of bent hau branches tied with hau cord; people who were sick were given sweat baths inside, then bathed in seawater and fed.

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[35] Konia Freitas. "Kauhale- The Traditional Hawaiian Homestead." Paper for PLAN 632, "Planning for Hawaiʻi and Pacific Islands." (University of Hawaiʻi Mānoa-DURP. Honolulu, HI: 1995), 27-30.

Figure 9. Kauhale layout.[36]

[36] Konia Freitas. "Kauhale-The Traditional Hawaiian Homestead." Paper for PLAN 632: "Planning for Hawaiʻi and Pacific Islands." (University of Hawaiʻi Mānoa-DURP. Honolulu, HI: 1995), 28.

2.1.5 Heiau: Temple Structures

The heiau, a religious structure was most influenced by the ancient Hawaiian religion defined by its function.[37] This was the physical definition of space where certain rituals and ceremonies were performed and where the gods manifested themselves. The most important of the gods were the akua: Kū, Kāne, Lono, and Kanaloa. They were closely associated with the Aliʻi, the ruling class who were considered to be manifestation of the akua and the believed to be the ancestors of the Hawaiian race. The Hawaiian people also prayed to their gods at different kinds of sacred sites from a simple plant, stone, or cave on the landscape to enormous structures. The ritual procedures were more important than the temple structure itself because the religious protocol was the connection to ka poʻe kahiko and akua.[38]

The precision of the rituals and elaborate ceremonies involving the heiau was enforced with strict ritual process. The sacredness of the physical elements of the heiau was a temporary condition.[39] According to Shimizu, at the conclusion of the intensive labor movement involved in the construction of a heiau and ceremonies, the heiau was abandoned until the next major event. Although the main akua of the heiau remained sacred, the other images were no longer valued and respected. These wooden images were not restricted for use as firewood. Kamakau shows that the burning of the heiau was done by the Hawaiians and was in provisions for war on Kauaʻi.[40]

In the feudal system of the ancient Hawaiians, there was a process of social movement toward internal competition. The most notable results were the increase in separation between the makaʻāinana and the ruling class of the Aliʻi and the specialization of the kahuna class.

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[37] Valerio Valeri. *Kingship and Sacrifice: Ritual and Society in Ancient Hawaii.* Translated by Paula Wissing. (The University of Chicago Press. Chicago, IL: 1985), 173.
[38] Michael Kolb. "Diachronic Design Changes in Heiau Temple Architecture on the island of Maui, Hawaiʻi," *Asian Perspectives*. Vol. 31, No. 1 (The University of Hawaiʻi Press. Honolulu, HI: 1992), 15.
[39] Byron Shimizu. "An Architectural Analysis of Hawaiian Heiau Focusing on the Island of Oahu." MA thesis. (University of Hawaiʻi Press. Honolulu, HI: 1980), 9.
[40] History of Kamehameha I, Kuokoa: Hawaiian Newspaper (August 24, 1867). Translated by Thomas G. Thrum, "Paehumu of Heiaus Non-Sacred", *The Hawaiian Historical Society Annual Report* (1926), 57.

Figure 10. Typical features of a luakini heiau.[41]

The luakini heiau as shown in Figure 10 were monumental structures where ruling chiefs prayed and human sacrifices were offered. They were often required to build a heiau as part of their executive responsibilities to the people that would promote peace and prosperity. Malo describes these matters when the worship of the gods were cared for appropriately, then the king was highly commended as a righteous king. When the people saw this, they devoted themselves to their farming, arts, and crafts, as well as women beating and printing their tapa cloth.

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[41] Van James. *Ancient Sites of Maui, Molokaʻi, and Lānaʻi: Anthropological Places of Interest in the Hawaiian Islands.* (Mutual Publishing. Honolulu, HI: 2001), 14.

Table 4. Classes of Shrines and Temples[42]

CLASS	MAJOR	SHRINES	MAJOR & MINOR	MINOR
Size	Large	Small	Medium, Large	Small
Gods	Kū Kane on Kaua'i Kane on Maui	Kū	Lono	Kane
Temples	Luakini Ho'ouluulu i'a	Ko'a Kuahu	Ho'ouluulu ua Ho'ouluulu i'a	Ho'ouluulu'ai
Purpose	War Stability	Fishing Bird snare Aquaculture	Agriculture Husbandry	Agriculture, child birth, debt, surfing, canoe building, medicine, sorcery, love impelling, circumcision, prophecy, tapa beating
Officiant	Paramount	Commoners	Priest, Commoners	Chiefs, Priests

[42] Valerio Valeri. *Kingship and Sacrifice: Ritual and Society in Ancient Hawaii.* Translated by Paula Wissing. (The University of Chicago Press. Chicago, IL: 1985), 172-4.

Table 5. Classification of Heiau Types[43]

CLASSIFICAITON	ASSOCIATED SOCIAL CLASS	SPECIFIC TYPES	DESCRIPTION	GENERAL TYPES
MAJOR	King Exclusively	Mao Kuk'ae ahuwai Prayer/Burial	A heiau for Ali'i only (Malo, 1951) For purification at the end of Makahiki Period (Malo, 1951) Function as indicated by name (Bennett, 1932)	King's Private
		Luakini kaua	A war temple (Malo, 1951)	Sacrificial or Po'okanaka (places of human sacrifice)
		Luakini ho'oululu'ai	Dedicated for abundant harvest (Malo, 1951)	
		General	A luakini in which services such as the loulu ceremonies are conducted (prevention of epidemics) ('Ī'ī, 1973) Made to bring blessings on the population (Kamakau, 1974)	
	Kings And Chiefs	Waihau Unuunu Ho'oulu'ai	Bring blessings to the people (Kamakau, 1974) For the increase of food crops (Kamakau, 1974)	
		Unu o Lono Mapele Ipu o Lono Hale o Lono	An illness (Malo, 1951)? (Malo, 1951) For blessing on crops (Malo, 1951) For increase (Kamakau, 1974) A thatched house enclosed with a fence of lama wood; function unclear (Ī'ī, 1973)	Heiau dedicated to Lono
		Ho'oulaua Heiau loulu Hale o Kaili Hale Hui Lono Puha Kolea Muku	A heiau to bring rain (Malo, 1951) Propitiated to the fishing gods for abundant food (Malo, 1951) Dedicated to the god Kaili or Kukaili moku ('Ī'ī, 1973) Dwelling for miscellaneous gods ('Ī'ī, 1973) Dedicated to Lono Puha upon recovery from an illness (Malo, 1951) Dedicated to Kolea Muku upon recovery from an illness (Malo, 1951)	Heiau dedicated to miscellaneous gods
	Female Chiefs	Hale o Papa	Dedicated to the female deity Papa for the services of chiefesses ('Ī'ī, 1973)	
MINOR	Priests	Ulu Hale Hale Lau Moku Hale	Houses used in the medical arts (Kamakau, 1974)	
		Dwelling places and Learning places	Houses used by priests were considered minor heiaus (Bennett, 1932)	
	Priests and Commoners	Tapa beaters', women's debtors', hula, canoe builders' Surf riders Love impelling	Function as indicated by name (Bennett, 1932)	
	Commoners	Ko'a Ku'ula Heiau or Mua	A fishing shrine (Malo, 1951) Fishing shrine dedicated to Ku'ula (Malo, 1951) A house containing the family shrine for daily worship (Malo, 1951)	

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[43] Byron Shimizu. "An Architectural Analysis of Hawaiian Heiau Focusing on the Island of Oahu." MA thesis. (University of Hawai'i Press. Honolulu, HI: 1980), 11.

2.1.6 The Kuhi-kuhi-puʻu-one: Kahuna Architect

A luakini heiau was a war temple which the Aliʻi, in his capacity as ruler over the people and land, was built when he heard the news of another Aliʻi wanting to wage a war against him. At this point, the Aliʻi would ask the advice of the kahuna pule [priest or expert in prayers] about building a new heiau to insure his victory over his enemies. When the kahuna pule completed the prayers to the gods, he advised Aliʻi to summon the kahuna kuhikuhipuʻuone or kahuna architect. The term kuhikuhipuʻuone referred to a priestly architect who drew the plans of the heiau in the sand [kuhikuhi-to point; puʻu-sand dunes; and one (pronounced oh-nay) -sand]. The kahuna kuhikuhipuʻuone would then advise the Aliʻi where the site for the heiau would be built, the placement of the wooden images, the prayer tower, and various hale for different functions. [44]

His role is best described by David Malo; His function of the kuhikuhipuʻuone as one who exhibits a plan of the heiau to the Aliʻi because this class of persons were thoroughly educated in all these temples. They studied the heiau on the ground, saw their sites, and knew the plans from ancient times. In addition, the temple architects also knew the heiau of certain ancient Aliʻi's that resulted in victory over another king. This was the heiau plan which the kahuna kuhikuhipuʻuone explained to the Aliʻi and if the Aliʻi was pleased, he made a plan of the heiau on the ground and showed it to the Aliʻi.

One example of this act is explained by ʻĪʻī's personal experiences which takes place during the reign of Kamehameha I. The story begins at a place named Puaaliʻiliʻi [known as Kalakaua Avenue] which was a long time residence of Kamehameha I. Haalou, a makuahine [woman] of Kamehameha had consulted a seer of Kauai named Kapoukahi. He was a kahuna kuhikuhipuʻuone an expert in selecting heiau sites and advised Haalou to inform Kamehameha that he would become victorious over Keoua Kuahuula. Keoua was in pursuit of his cousin

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[44] David Malo. *Hawaiian Antiquities: Moʻolelo Hawaiʻi.* Translated by Dr. Nathaniel B. Emerson 1898. Bernice Pauahi Bishop Museum, Special Publication 2, Second Edition. (Bishop Museum Press, Honolulu, HI: 1951), 160-1.

Kamehameha I because after his father died, Keoua was not given any land. Following the instructions of Kapoukahi, Kamehameha built Puʻukohola heiau, a luakini temple to gain favor of the war god, Kūkaʻilimoku, restored Mailekini and fought Keoua to gain control of Hawaiʻi Island where Kamehameha I was victorious.[45]

As with the hale [house] and canoe builders, temple architects used the indigenous measuring system for heiau structures. From the length of their arms to their fingertips, Hawaiians found another way to measure that would standardize collecting building materials (See Table 6).

The purpose of pointing out the above description indicates that 1) there were specialists trained in a traditional manner by experts in their field displaying a holistic approach to design and 2) by using the sand as a presentation technique showed the specialists' design was predetermined. This process signified an important architectural vocabulary of a religious structure for the community.[46] The Hawaiians used a simple counting system where they could at least add and subtract. They used a base unit of four as well as a base ten numerical system. These units were called kāuna [four]; kaʻau [forty], lau [four hundred]; kini [forty thousand] and so on. They system had to be simple because they did not have any written numbers. Thus, the concept of numbers may have been a great achievement because in terms of mathematical history, the idea of numbers represented a major intellectual accomplishment.[47]

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[45] John papa ʻĪʻī. *Fragments of Hawaiian History.* Translated by Mary Kawena Pukui. (Bishop Museum Press. Honolulu, HI: 1959), 17-8.
[46] Byron A. Shimizu. "An Architectural Analysis of Hawaiian Heiau Focusing on the Island of Oahu." MA dissertation. (University of Hawaiʻi. Honolulu, HI: 1980), 6-10.
[47] George S. Kanahele. *Hawaiian Values for the Hospitality Industry.* (Waiaha Foundation. Honolulu, HI: 1992), 84.

Table 6. Hawaiian Measurement System[48]

Hawaiian Measuring Unit	Meaning	Western Measuring Unit
Kino	Human body; vertically	About 6 feet
Anana	Arms extended horizontally; distance between the fingertips of the hands	6 imperial feet
Moku (5/6 Anana)	Arm extended horizontally; the distance between the fingertip and the elbow.	4-5 feet
Iwilei (2/5 Anana)	The distance from the fingertip to collar bone	About 2-3 feet
Ha'ilima (1/4 Anana)	From the fingertip to the elbow	About 1-1/2 feet
Kīko'o (0.10 Anana)	Distance from the thumb to the index finger	About 6 inches
Poho	Distance from the thumb to the index finger	3 inches

2.1.7. Pu'uhonua

Pu'uhonua was a place of refuge, sanctuary, asylum or a place of peace and safety that is established by the ruling chief.[49] Literally, pu'u is a hill and honua, the earth. Kamakau defined it as a place to go to escape and be saved from being taken prisoner or from being put to death.[50] Some chiefs ruled without incidents but if someone had broken a kapu, he or she could flee to a heiau designated as a pu'uhonoua. At the heiau, they were placed under the supernatural protection, as well as the physical protection of the enclosure and the kahuna pule. One of the most important pu'uhonua heiau on Hawai'i Island is Hale O Keawe, as seen in Figure 11 was built for Keawe-i-kekahi-ali'i-o-ka-moku. It functioned more than a pu'uhonua but also as a depository for the bones of the chiefs and home to wooden images and altars.[51] There may have been other pu'uhonua heiau but not within the vicinity, Hale O Keawe was accessible to those

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[48] Mary Kawena Pukui and Samuel H. Elbert. *Hawaiian Dictionary-Hawaiian-English-English-Hawaiian Revised and Enlarged Edition.* (University of Hawai'i Press. Honolulu, HI: 1986).

[49] Samuel Kamakau. *Ka Po'e Kahiko: The People of Old.* Translated from the Newspaper Ke Au 'Oko'a by Mary Kawena Pukui. (Bishop Museum Press. Honolulu, HI: 1991), 17-9.

[50] Samuel Kamakau. "Ka Mo'olelo Hawai'i: Ke Au 'Oko'a March 10, 1870a. (Hawaiian Newspaper), 1.

[51] *The Natural and Cultural History of Hōnaunau, Kona, Hawai'i*. Prepared for National Park Service, Pacific Area. Departmental Report Series 66-2. Department of Anthropology: Bernice Pauahi Bishop Museum. (Bishop Museum Press. Honolulu, HI: 1986), 117-9.

who could enter the stoned wall structure.   Once on the grounds, violators felt relieved and safe because the ancestors of great inheritance are buried there and their mana felt throughout the enclosure.

The connection tells of himself, his aumākua [ancestral gods], and genealogical ties that provide a path to physical and spiritual values of the culture. These rituals on the wahi pana were sacred ceremonies performed during the night or early morning with prayers, offerings, and conversations with personal ʻaumakua or family gods such as sharks, owls, and turtles. They were fed and cared for because these were the physical and spiritual protectors for the family. With respect, they were not harmed nor eaten but treated with great reverence because it was significant for Hawaiians to practice their culture and traditions.[52]   These sacred places had great mana [divine power] and ka poʻe kahiko honored these resources as divine gifts from the gods where fishing and agriculture activities were not abused but treated with respect.[53]

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[52] Mary Kawena Pukui and Samuel Elbert. *Hawaiian Dictionary.* (University of Hawaiʻi Press. Honolulu, HI: 1986), 32.
[53] Van James. *Ancient Sites of Oʻahu.* (Thoughts written by Edward Kanahele in the foreword of Ancient Sites of Oʻahu). (Bishop Museum. Honolulu, HI: 2010), x.

The Depository of the kings of Hawaii, adjoining the Place of Refuge at Honaunau

Figure 11. Hale-o-Keawe Puʻuhonua Heiau.[54]

2.1.8 Loko Iʻa- The Fishponds

In ancient Hawaiʻi, aquaculture occupied all the Hawaiian Islands with great intensity

that utilized practically every body of water from the seashore to the upland forests, as sources for

food, either agriculturally or aqua-culturally. By the end of the 18th century, more than 300

fishponds were owned by high chiefs which was one of the ultimate high-status symbols in

Hawaiian culture.[55]

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[54] Puʻukohola Heiau, Kaloko-Honokahau, Puuhonua o Honaunau National Historical Park System: A Cultural History of Three Traditional Hawaiian Sites on the West coast of Hawaiʻi Island: 1992. (Hale o Keawe lithograph drawing by William Ellis, 1823).

[55] Russell A. Apple and William K. Kikuchi. *Ancient Hawaiʻi Shore Zone Fishponds: An Elevation of Survivors for Historical Preservation.* (Office of the National Park Service-U.S. Dept. of Interior. Honolulu, HI: 1975), 1-13.

One unique feature of the fishponds was the mākaha or the sluice grate with its associated sluice. This stationary grate had no moveable parts. It was the technological innovation that allowed Hawaiians to control tide dependent fish traps to artificial fishponds at all times of the tide. For the most part, ancient Hawaii's food production system was massive and depended upon water in all forms. (ie. rain, ponds, flowing, extruded from springs and streams, fresh, salt and brackish).

Loko is the general term for Hawaiian ponds, lakes, pool or an enclosed body of water and iʻa is fish or marine animal.[56] There are five main types of fishponds and fish traps.

1. Loko kuapā was built with a natural sand bank between the pond and the sea utilizing the seal wall.

2. Loko puʻuone or loko haku one was an isolated shore fishpond usually formed by the development of a barrier beach building a single sand ridge.

3. Loko wai is a fishpond located inland from the shore with fresh water.

4. Loko iʻa kalo or loko loʻi kalo utilizes an irrigated taro plot where fishes grown in this water flowed among the earth mounds planted with taro corms.

5. Loko ʻumeʻiki is a fish trap that led fishes into a netting area with the ebb and flow of the tide.

The first three were royal types owned exclusively by ruling chiefs and managed by their caretakers as shown in Figures 12 and 15. The Hawaiian people had extended their innovation to this shoreline development by designing and engineering in perfect balance with the understanding of the forces of nature, the ecology of the seawater and the management of aquaculture.

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[56] Mary Kawena Pukui and Samuel H. Elbert. *Hawaiian Dictionary: Hawaiian-English English-Hawaiian. Revised and Enlarged Edition.* (University of Hawaiʻi Press. Honolulu, HI: 1986), 92, 210.

In viewing the joinery between the rocks and grout less bearing surfaces of the rocks, there are large puka or gaps. However when comparing this precise bull bearing masonry joints of the ancient Egyptians, such as the pyramids of Giza, Minoan, Greek, the ruins of Machu Picchu or even Mayan temples, the ancient Hawaiians were purposeful in their masonry and layout of sea walls. The puka or voids that ran from mauka to makai within the wall filtered incoming debris, oxygenating the seawater as it passes from the ocean to the pond. These structures were cultivated to cultivate fish with the purpose of providing a steady supply for the Aliʻi.

Figure 12. Alekoko Fishpond on Kauai.[57]

[57] http://www.coatia.org/crown/articles/9125/1/Hawaiian-Fishponds-in-the-Adriatic.html Access on: February 10, 2012.

Figure 13. Fishpond of the Aliʻi.[58]

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[58] http://www.croatia.org/crown/articles/9125/1/Hawaiian-Fishponds-in-the-Adriatic.html Access on: February 12, 2012.

NORMAL TIDE RANGE   GRATE

~ ROCKS ~

VIEW OF MAKAHĀ FROM SEAWARD

GUARD HOUSE   NETTERS
                               AREA

AUWAI O KA MAKAHĀ

SEAWARD

PLAN OF MAKAHĀ

15-25°   11-20°

SEAWARD   POND SIDE

NORMAL
TIDE RANGE   SILT

WALL SECTION BASED ON D2 ALI'I POND, MOLOKA'I

Figure14. Schematic of the fishpond.[59]

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[59] Russell A. Apple and William K. Kikuchi. *Ancient Hawaii Shore Zone Fishponds: An Evaluation of Survivors for Historical Preservation.* (Office of the State Director National Park Service. United States Department of Interior. Honolulu, HI: July 1975), 21.

Figure 15. Cross-section detail of the Kaloko fishpond construction method.[60]

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[60] David Cheever and Scott Cheever. *Pōhaku: The Art and Architecture of Stonework in Hawaiʻi.* (Editions Limited. Honolulu, HI: 2005), 24.

2.1.9 Lo'i kalo: Taro Terraces

The early Hawaiians developed an economy centered upon agricultural production and land-use was central to a tiered system of land divisions.[61] All the islands or large parts of the islands were controlled by independent chiefdoms. Divisions of the land section usually ran from the mountain to the ocean was known as the ahupua'a and encompassed all the resources of both the land and the sea. Every activity in the ahupua'a was carried out within the spiritual and cultural belief system which maintained harmony, balance, peace, and nurturing for both physical and spiritual worlds.[62]

Each ahupua'a was managed by a chief who appointed one or two stewards to oversee production, organize the labor force, collect the taxes, and other ways that represent the chief. They lived economically and self-sufficient to some respects. Although the local resources may differ, the water resource was the key component for planting taro along with stone for tools. They designed and constructed the 'auwai system or ditches to bring the water from the stream into their patches and built small rock and earth dams to regulate the flow. Fresh water was viewed as sacred and the Hawaiian people knew that the rights to its use were directly related to the amount of labor that farmers contributed to building and constructing the 'auwai.[63] Although, the traditional Hawaiian system of irrigating lo'i made intensive cultivation of kalo possible, this process ensured the water was distributed fairly and used wisely in the ahupua'a.

From a very early time in their history, Hawaiians exhibited engineering and building skill, ingenuity, industry, and planning and organizing ability in three types of construction: the grading and building of terraces for growing wet taro; construction of irrigation ditches and

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[61] Patrick V. Kirch. *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Pre-history.* (University of Hawai'i Press. Honolulu, HI: 1985), 2.
[62] Katherine K. Smith. "Pu'uhonua: The Legacy of Olowalu. A History of Olowalu before 1790." (Olowalu Cultural Reserve. Olowalu, HI: May 2010), 16.
[63] William K. Kikuchi. "Prehistoric Hawaiian Fishponds." Science. Vol. 193 No. 4250 (1976), 295-9.

aqueducts to bring water to these terraces;; and construction of fresh-and-salt-water fishponds.[64] A number of tropical plants were cultivated by the Hawaiians—tropical root, tuber, and the most important was kalo [taro] and ʻuala [sweet potato]. Taro was grown wherever rainfall was adequate, inn   patches filled with water or water flow from streams or springs from the mountains. Hawaiians were the most productive agricultural ecosystem and labor intense. The valley and cliff complex offered the most favorable locale for building taro pond field irrigation systems allowing for continued stream flow as seen in Figures 16-17.

Taro also played an important role related to the eldest sibling in the traditional Hawaiian family structure. The eldest took care of the young siblings, in turn, they would honor the eldest. Hawaiians were deeply rooted with spiritual connections to the land, sea, sky, and other elements that reflect traditional cultural practices. The ways that cultural traditions were transferred to each new generation is attributed to practice and by example, ensuring the continuation of healthy ecosystems. Encompassing many manifestations of the gods, everything was believed to have mana or spiritual power. The rocks, plants, fruits, and marine life were embraced by the Hawaiian people and they embraced life, understood it, and became one with the natural elements.

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[64] E. S. Craighill Handy and Elizabeth G. Handy. *Native Planters in Old Hawaiʻi. Their Life, Lore, and Environment.* Bernice Pauahi Bishop Museum Bulletin 233. (Bishop Museum Press. Honolulu, HI: 1972), 42-3.

Figure16. Taro fields in Hanalei Valley, Kaua'i.[65]

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[65] http://www.activatekauai.ning.com Ahupua'a Activation Kaua'i-Permaculture Guild Kaua'i: Keeping our new 'ohana strong and connected. Access: March 2, 2012.

Figure 17. Taro fields in Waipiʻo Valley on Hawaiʻi Island where conditions are ideal for irrigating taro fields.[66]

2.2.0 *Wahi Pana: Sacred Places*

Archaeological sites have varied meanings and significance to different people.[67] To the ka poʻe kahiko, these sites establish geographic connections to their history and cultural heritage. The wahi pana are sacred places found within a cultural landscape but has drastically changed within the last two centuries due to urbanization. The late Hawaiian historian, Edward Kanahele gave a value based interpretation of wahi pana, the sacred and celebrated places of Hawaiians that

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[66] http://www.gohawaii.about.com Waipiʻo rim hike adventures in Hawaiʻi. Access: March 2, 2012.
[67] Patrick V. Kirch. *Legacy of the Landscape. An Illustrated Guide to Hawaiian Archaeological Sites.* (University of Hawaiʻi Press. Honolulu, HI: 1996), vii.

have mana, spiritual power. He stresses that these places tell him the history of himself, of his family and the history of his people. It also tells of the spiritual connections with the gods and ancestral guardian spirits, the ʻAumākua. These are places that are often sought after in search for pono, proper behavior and lōkahi, the balance from a Hawaiian worldview.   Even though it is difficult to piece the Native Hawaiian history together in order to rebuild and redefine a spiritual connection to these islands, it is important to acknowledge that the community who is maintaining cultural beliefs and practices associated with these wahi pana should determine the significance of the source. One manner helpful to *ʻIke Hawaiʻi* (Hawaiian knowledge and understanding) and *Nohona Hawaiʻi* (Hawaiian way life or living Hawaiian culture) is to include Kanahele's guiding principles on "Restoring Our Sense of Place" and "Criterion on Significance of a Wahi Pana" and McGregor's typology of Hawaiian Cultural Resource Management, if what they intend to do is pono (See Table 7).[68]

One special wahi pana that benefit all Hawaiian people-past, present and future born, as well as inspiring generations of all cultures is Papahānaumokuākea. This is the name given to the Northwestern Hawaiian Islands Marine National Park monument as seen in Figures 18-19. This name comes from the ancient genealogy and formation of the Hawaiian Islands. Papahānaumoku is the earth mother and Wākea is the sky father and are recognized as the two ancestors as the beginning of the Hawaiian people. The names together strengthen Hawaii's cultural foundation and ground Hawaiians to an important part of their historical past. This name encourages abundance and energizes the procreative forces of the earth, sea, and sky. It reminds the people that it is the spiritual inspiration that support the physical world.

Through their union was the result of creation or birthing of the archipelago. Papa which means foundational earth provides the imagery of the numerous low flat islands that stretch across into northwest. Akea provide the imagery of the expanse-of-space. From Mauna-Akea on

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[68]http://apps.ksbe.edu/kaiwakiloumoku/kaiwakiloumoku/about/ike-hawaii Access: April 18, 2012.

Hawaiʻi Island to the low flat Papa of the northwest, the physical features define our homeland and Hawaiian identity. Thus by the nineteenth century, many sacred places in Hawaiʻi were extended to dwellings of legendary kahuna, temples, and shrines, places of refuge and burial sites.

Table 7. Wahi Pana

George Kanahele's Guiding Principles on "Restoring our Sense of Place"	Ed Kanahele's Criterion on Significance of a *Wahi Pana*	Davianna McGregor's Typology on HCRM
1. Individuals and families should get to know the meaning and history of their Hawaiian ancestral place. 2. After such, they should enhance and share the knowledge. 3. These places need to be revisited to recapture a part of oneself, or perhaps to regain a lost perspective by uncovering a facet of family life that has lain hidden under the overgrowth of time. 4. If one is fortunate to have access to such a place, every reasonable effort should be made to preserve and maintain it as the *wahi pana*, the "storied place", where family members can come together to reminisce, eat, dance, kanikapila, hoʻoponopono, and renew their commitments to ancestors. 5. It is vital to educate both visitors and local residents about the significance that certain places have for Hawaiians, appealing to their goodwill or guilt to keep those places unspoiled. 6. Hawaiians can do collectively to maintain their sense of place is to realize that, because our people were here first, we of today have primary responsibilities for preserving and enriching the life of the land. 7. The land does not belong to us, but we belong to the land. We are stewards of the land and ocean, trusted to take care of the land on behalf of the gods, our ancestors, ourselves, and our children.	1. How does this place give you a history, the history of your clan, and the history of our people. How are you able to look at a place and tie in human events that affect you and your loved ones. 2. In what way are you able to gain spiritual wisdom from this place. A necessity to reactivate the ancestral and spiritual sense of place. 3. Is your *wahi pana* defined by a god, if so, if your *wahi pana* is favored by a dominant god or high status disciple than this is inherently more remarkable than one favored by a lesser god or being. If not defined by a god, is it defined by an individual, and event, and/or function. 4. Acknowledging the dualistic nature of life; does your *wahi pana* favor females, males, or is useful to both sexes. 5. What are the rituals associated with your *wahi pana*, and are you able to perform them in relative solitude.	1. The ahupuaʻa is the basic unit of Hawaiian Cultural Resource Management. 2. The natural elements- land, air, water, ocean- are interconnected and interdependent. 3. Of all the natural elements, fresh water is the most important for life and needs to be considered in every aspect of land-use and planning. 4. Hawaiians ancestors studied the land and the natural elements and became very familiar with its features and assets. Therefore it is important to consult Hawaiian place names, chants, legends to learn of the cultural and natural resources of a particular district.

Figure18. Papahānaumokuākea Marine National Monument map.[69]

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[69] Papahānaumokuākea Marine National Monument Management Plan. (State of Hawai'i Department of Land and Natural Resources. VII Final Environmental Assessment: Cultural Impact Assessment. Honolulu, HI: Nov. 2008), 6.

Figure 19. Papahānaumokuākea Marine National Monument Boundary.[70]

[70] Papahānaumokuākea Marine National Monument Management Plan. (State of Hawai'i Department of Land and Natural Resources. VII Final Environmental Assessment: Cultural Impact Assessment. Honolulu, HI: Nov. 2008), 7.

2.2.1 A Story of Place

In Hawaiʻi, Native Hawaiians were deeply rooted in cosmologies both simple and in profound ways that they describe Hawaiʻi as their birthplace by connecting to the land. Through story telling about place names, Hawaiians were able to preserve the memories for many generations and provide the foundation for their identity as a people and identify the resources of those places. From these stories, Hawaii's written histories were recorded during the 1780's by early European visitors and sailors and native scholars writing after 1820. Other stories also told of a place where people lived, worked together, and knew each other's family. Some of these stories appeared in the written records such as deeds and other government documents of land ownership and property boundaries. One example is a story that describes a dispute between the owners of two ahupuaʻa border between Hāʻena and Wainiha on Kauai where two seas fronting Hāʻena as Hialaʻa and Koaʻekea, the sea fronting Wainiha. Kaonohi who testified orally [from memory] said that he knew the boundaries of the land from the time of Kaumualiʻi because he was raised in a place called Wainiha. He described which boundaries were running mauka to makai and the Kanakas who worked with birds. This oral tradition was passed down to me by his parents. In addition, others also testified from memory on the boundaries of Wainiha and Hāʻena.[71]

Figure 20. Wainiha and Hāʻena Ahupuaʻa, Kauaʻi.

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[71] Carlos Andrade. *Hāʻena: Through the Eyes of the Ancestors.* (University of Hawaiʻi Press. Honolulu, HI: 2008), 31-6.

2.2.2 Cultural Values

The natural things in the universe, both living and non-living, possess a spiritual essence by which the ka poʻe kahiko Hawaiian ancestry had a deep respect for all things.[72]   From this arose a respect for nature which is the core value in Native Hawaiian beliefs. By using these values, proper guiding principles can be established to manage land use and the natural resources. The following are few important words which evolved from the life style of the Hawaiian people:

Aloha:	To have love or compassion, gratitude, kindness, pity, grief.
Aloha Kekahi i Kekahi:	To love and care for one another.
Haʻahaʻa	Humble, minimum, meek
Lōkahi:	Unity, together as one; agree or in agreement.
Lokomaikaʻi	Goodwill; generosity
Mālama ʻĀina	Preserve, keep, watch over, take care of, protect.
ʻOiaʻiʻo:	Truth, fact, genuine; real, sure, authentic.
Pono:	Goodness, correct or proper procedure, behavior; upright, harmony.

Aloha ʻĀina, love, respect, and admiration for the land form the basis for the Hawaiian philosophy of the environment. This love is further extended in the word, kamaʻāina, child of the land. For instance, a person who lives in the area refers to himself as a kama-ʻāina, in contrast to a malihini, a stranger of the land. The phrase aloha ʻāina itself can also be found in various chants created for Pele and Hiʻiaka, mythical goddesses who live in the district of Puna—"O Puna, ʻāina aloha…O Puna, beloved land![73] These values but a few are prominent in Hawaiian

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[72] Michael K. Dudley. *Man, Gods, and Nature.* Introduction by John Dominis Holt. (Nā Kāne O Ka Malo Press. Honolulu, HI: 1990), 103-5.
[73] Nathaniel B. Emerson. *Pele and Hiʻiaka: A Myth from Hawaiʻi.* (Honolulu Star-Bulletin Press. Honolulu, HI: 1915), 199.

life today, yesterday, and tomorrow. The following chapter discusses how these and other

cultural values are applied to traditional teaching and learning.

MOKUNA 'EKOLU:
CHAPTER 3
TRADITIONAL HAWAIIAN EDUCATIONAL

"Weaving the Basket"---
Ulana ana i ka 'eke

3.1.1 Introduction

From the article, *Native Hawaiians and Psychology: The Cultural and Historical Context of Indigenous Ways of Knowing,* Professors of Psychology Laurie McCubbin and Anthony Marsella wrote that the educational field has been the connector through which replaces traditional cultural ways of life were replaced with Western cultural practices. Considering this result, drastic changes occurred due to western education imposing their educational standards upon Native Hawaiians. [74] Yet at the same time, traditional Hawaiian cultural values, beliefs, and practices have been persevered and survived to exist side by side with the modern western way of life. This thesis continues to explore contributions to the history and practices of the traditional Native Hawaiian learning and training system so that an assessment can be established from which a Native Hawaiian architecture learning model can be produced.

3.1.2 Traditional Ways of Learning

A'o is the Hawaiian word for education implies both to a'o mai [learn] and a'o aku [to teach]. [75] This system of receiving and giving knowledge is acknowledged by Hawaiians who support the idea that connecting and belonging which are primary actions in a traditional Hawaiian reciprocity society. By building these relationships, a person learns and becomes the master whereby knowledge and skills are subsequently used and shared with others. For instance,

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[74] Laurie D. McCubbin and Anthony Marsella. "Native Hawaiians and Psychology: The Cultural and Historical Context of Indigenous Ways of Knowing." *Cultural Diversity and Ethnic Minority Psychology.* 2009: Vol. 15(4): 374-7.
[75] Malcolm Nāea Chun. *No Nā Mamo: Traditional and Contemporary Hawaiian Beliefs and Practices.* (University of Hawai'i Press. Honolulu, HI: 2011), 84.

a chief's knowledge and skills gave him a sense of independence and power. The chief shared his ability to help his people become better stewards of the land by implementing proper management of the resources to ensure adequate provisions for his people. In turn, a good chief was honored and respected but a chief who was careless and reckless either faced death or was replaced.

As skilled teachers with mastery of their crafts, the kūpuna were very intellectual, wise, knowledgeable and understanding and suited for the role of mentoring children who learned according to their performance.

Nānā ka maka; hoʻolohe ka pepeiao; paʻa kou waha.
Observe with the eyes; listen with the ears; shut the mouth.
(Thus one learns)[76]

Following the writings of Mary Kawena Pukui and Samuel Kamakau, traditional education of a child was based on each child's particular strengths and performance observed by the kūpuna. If a child observed what was being taught, he would learn; by listening, the child would commit things taught to memory; and by practicing, the child would master the skill.[77] At this point, it must be acknowledged that promoting a child to the next grade level was not dependent upon the child's age but by observation of skill and interest levels. In the natural environment, children were encouraged to experience playing, visiting family and roam freely until the age of six or seven, sometimes older. These are the best times in early childhood for physical and brain development during the foundation years and learning at their own pace. Children were beloved and cherished and everyone in the community felt a responsibility for the well-being of that child. The success of each child was dependent on the relationship between the elders and community

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[76] Mary Kawena Pukui. *ʻŌlelo Noʻeau: Hawaiian Proverbs and Poetical Sayings.* (Bishop Museum Press. Honolulu, HI: 1983), 248.
[77] Mary Kawena Pukui, E. W. Haetig, and Catherine Lee. *Nānā I Ke Kumu: Look to the Source:* Vol. 1 (Hui Hānai, an auxiliary of the Queen Liliuʻokalani Children's Center: Honolulu, HI: 1972), 49-52.

because in doing so, the children would become successful leaders in the future.

During this time, education was practical, skill-oriented, socially useful, and in tune with reality; environmentally aware, conserver cognizant, heavily influenced by learning by doing.[78] The hands created the doing after hearing the instructions and reflected on them. Corrections and making mistakes were part of the learning process. Kamakau, in his analysis of training students for the priesthood describes the following:

> […] until the pupil knew as much as his teacher, then the teacher would say
>
> to the pupil, "Concentrate your prayers (E kia ko pule) on that solid cliff and
>
> make it slide," and the people would concentrate on the cliff until it crumbled.[79]

This type of training and learning to become experts was not exclusive-on the contrary; there are certain patterns of education in a traditional society. As demonstrated by the above passage, the kahuna or priestly class was required to master long memorization of precise prayers, chants, and religious rituals and protocols. Another example was reflected in the training of students to become expert healers. In this case, the students and followers of this practice who had applied their practical skills and knowledge based on their strengths and natural talent helped establish a school and herbal farm in Kukuihāʻele on the island Hawaiʻi.[80] One of these applied skills was to prepare a graphic illustration of a human body for apprentices to practice. They arranged small pebbles in the form a body from its head to foot so that this practice model would help them learn how to heal by hāhā [feeling]. This arrangement was also applied toward teaching astronomy and learning star positions.

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[78] Marion Kelly. Some thoughts on education in traditional Hawaiian society. In *To Teach the children historical aspects of education in Hawaiʻi.* (College of Education. University of Hawaiʻi and Bernice Pauahi Bishop Museum. Honolulu, HI: 1982), 13.

[79] Samuel M. Kamakau. *Ka Poʻe Kahiko: The People of Old.* Translated from the Newspaper Ke Au ʻOkoʻa by Mary Kawena Pukui. (Bishop Museum Press. Honolulu, HI: 1991), 120-2.

[80] Samuel M. Kamakau. *Ka Poʻe Kahiko, The People of Old.* Translated by Mary Kawena Pukui. Edited by Dorothy Barrère. (Bernice P. Bishop Museum Special Publication 51. Honolulu, HI: 1964), 121.

Another process of learning was educating new leaders, the young chiefs who focused on politics, the military, and religion.[81]   While in politics, these young chiefs required to know the art and skill of governance and in the military, they acquired the ability to direct battle and to fight.   They continued their training with the kahuna pule on religion matters. The young chiefs were taught how to conduct rituals, protocols, and ceremonies as a chief-priest. They were also sent out to live with wise and skilled people, listening first to the words of experts and important matters that would benefit their rule. Kamakau revealed that under the Hawaiian system, a simple method such as the rote method may have been used especially when teaching certain chants, hula moves, oratory, or prayers by repetition.[82] When a learning system is not based upon literacy, other learning senses such as memorization, careful observation, and practice are essential.[83]

3.1.3 Continuing a Kingdom of Learning

In ancient Hawai'i, ka poʻe kahiko were learning how to read and write before the arrival of American missionaries.[84] There were continuous encounters and exchanges between Euro-American explorers, traders, and other visitors for more than forty years before the first missionaries arrived. One example of writing gave way to women who would use their brushes that were made from natural fibers to write or draw various figures on cloth or tapa. They understood what each figure represented.   Kamakau in *Ruling Chiefs of Hawai'i* wrote that as soon as the chiefs saw that it was a good thing to read and write, they quickly took teachers into

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[81] Malcolm Nāea Chun. *No Nā Mamo: Traditional and Contemporary Hawaiian Beliefs and Practices.* (University of Hawai'i Press. Honolulu, HI: 2011), 98-9.
[82] Samuel M. Kamakau. *Ruling Chiefs of Hawaiʻi, Rev. Ed*. (The Kamehameha School Press. Honolulu, HI: 1992), 249.
[83] Malcolm Nāea Chun. *No Nā Mamo: Traditional and Contemporary Hawaiian Beliefs and Practices.* (University of Hawai'i Press. Honolulu, HI: 2011), 90.
[84] Malcolm Nāea Chun. *No Nā Mamo: Traditional and Contemporary Hawaiian Beliefs and Practices.* (University of Hawai'i Press. Honolulu, HI: 2011), 104.

their homes to teach his household.[85]

Soon, the smartest of his household became teachers themselves and were sent out to other villages. The missionaries applied the rote method or memorization by reading aloud and repeating letters in unison. After practicing for three weeks, a competition was held and the winner received recognition from the public.

The quickest students were advanced by their teachers. They became leaders of the class as well as applying their method of teaching to reading and writing. This western standard of measurement applied to all students and they followed the same method and were rewarded for good behavior. In this setting, everyone wrote at the same rate and during the same period disregarding brain and developmental skills that differed between each child. Therefore, in the western system, teachers measured students against the standards earlier and earlier with high expectations of performing within the guidelines. This model does not allow for students to develop one skill at a time before introducing another course.

This new system impacted Hawaii's public education and further distanced the Hawaiian learning worldview and values with conflicting teaching methods.[86] The teaching methods varied when approaching the education of a Hawaiian child. No longer were there repetitive readings and memorization skills where children were able to accomplish each task instead student learning was based on a grading system. However, in traditional learning and teaching, Hawaiian children were always taught to avoid eye contact and never ask questions. This method was misinterpreted by a western method that only acknowledges an inquisitive and confident student with self-esteem. Thereby, Native Hawaiian students were considered to be stupid, slow, and sometimes harshly reprimanded. By far, the greatest impact to cultural teaching and learning was replacing family members and kūpuna with westerners' methodology: competition. Valued by

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[85] Samuel M. Kamakau. *Ruling Chiefs of Hawai'i, Rev. Ed*. (The Kamehameha School Press. Honolulu, HI: 1992), 248.

[86] Manette K. P. Benham and Ronald H. Heck. *Culture and Educational Police in Hawai'i: The Silencing of Native Voices*. (Lawrence Erlbaum Associates, Publishers. Mahawah, NJ: 1998), 112-3.

both westerners and Native Hawaiians, mastery skills were vital to the survival of the community and not just and individual. Western competition benefited as a profitable exercise and only rewarded individual achievement.

As such, traditional learning was not only based on literacy but was evaluated by immediate family members as well as kūpuna.[87]   This system of expertise allowed for a variety of teachings so that everything learned had practical and immediate application. For example, if a young person was learning to become a hale [house] builder, the kūpuna might start the lessons with planning what materials are required and how they are gathered in preparation to build a house. This process prepared students to be alert and remember carefully everything that was taught to them. Even with house building, students were taught to choose the site, the technique of lashing which tied the posts and rafters in position producing the frame of the hale and thatching to cover the hale. Learning would continue until a youth was an expert in his field. In this case, the key to learning is observation and once the kūpuna felt that they youth was ready because they had enough knowledge, displaying proper patience and listening techniques, he was taught other skills. In other words, the learner did not move from task to the next without completing the first task given to them. It was a fundamental and traditional way of educating a young person for their specific roles.

To further this point, morals, ethics, and relationships contribute to the success of each skill and Hawaiian cultural values were never removed from the Hawaiian system of learning. This means that by looking to the past of Hawaii's traditional ways of learning, a modern model for Hawaiian architecture education could emerge. However, education based on the missionary classroom of the 1800's is not working for the majority of Native Hawaiian students and

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[87] Mary Kawena Pukui, E. W. Haetig, and Catherine Lee. *Nānā I Ke Kumu: Look to the Source:* Vol. 1 (Hui Hānai, an auxiliary of the Queen Liliuʻokalani Children's Center: Honolulu, HI: 1972), 53-5.

architectural education is no exception. The success of Hawaiian Immersion schools supports this assertion.[88]

According to the Study of the Architectural Schools, 1929-1932, it criticized the dominance of design faculty over those specializing in construction.[89] Through personal experience, students in the design studios prepared and presented many projects that resulted in paper architecture only, in which the purpose or function was not clear or applied. The idea of architecture students solving problems through design methods with an emphasis on individual accomplishments rather than collaborative efforts with a design team and freedom of design rather than regimentation completely upsets the expectations of marks through grades, semesters, and quantitative measures. Architecture students are always in isolation. They are usually visible on campus late at night with the only brilliantly lighted classrooms and are usually in the least desirable building and spaces.

To realize the traditional Hawaiian education style of learning and teaching in architectural education, student design projects incorporates students' knowledge and practical skills must fully engage in immediate application. Architectural practices in education must end the isolation and begin building bridges between the professionals and communities. These joint efforts allow students to demonstrate their capabilities of developing a more cohesive planning paradigm through design concepts methods. This process acknowledge architecture students as professionals in their area of study and even more so, gives them a sense of pride and learning through real life experiences.

The conclusion of this researcher is that engaging architecture students and infusing them with Hawaiian cultural values would foster a very high rate of success.   Accomplishing each task

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[88] Walter Kahumoku, III. "The dynamics of cultural politics and language policy in public education: The case of Native Hawaiians." PhD Dissertation in Education. (University of Hawai'i. Honolulu, HI: 2000), 178.

[89] Ernest L. Boyer and Lee D. Mitgang. *A Special Report: Building Community: A New Future for Architecture Education and Practice.* (The Carnegie Foundation for the Advancement of Teaching. Ewing, NJ: 1996), 20.

in design is based on the expertise and strengths of the architecture students. Also, as kūpuna, professional architects are welcomed to observe, listen, and watch students closely and offer advice as part of their expertise. This style of engagement builds ladders between the student and professional one step at a time, strengthening the field with a renewed admiration for the profession.

3.1.4 Revisiting Traditional Learning

Since the creation of the Center for Hawaiian Studies on the University of Hawaiʻi Mānoa campus, Hawaiian values and styles of teaching continue today. In spite of the missionary style classroom started nearly 200 years ago, the kūpuna still continue to pass on their values, life experiences, and skills from their ancestors. One of the first formal educational institutions where cultural knowledge was passed down through oral traditions was the hula halau [dance school].[90] Despite the efforts of missionaries and other non-Hawaiians, the hula never became extinct, although fading out from public sight during the mid-nineteenth century. In ancient Hawaiʻi, hula was a living theater with a distinct Hawaiian repertoire of more than 300 hula.[91] It was a form of religious ceremony to honor the gods and chiefs and was usually dedicated to its patroness Laka, goddess of the hula. Performed by both men and women, not usually at the same time, the teaching methods were vigorous and repetitive: observing, listening, memorize the moves, chants, or songs, and practicing diligently. The sacred hulas were delicate, artistic, and subtle forms of dance, mastered only after many years of apprenticeship under a master teacher. Like the hula, architecture students would need to observe, listen, and apply practical skills to have a better understanding of how buildings actually get built, the importance of interactions with the community, and heed extended continuous training in design while in school by master architects in the field as well as professors in the academy.

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[90]E.S. Craighill Handy and Mary Kawena Pukui. *The Polynesian Family System in Kaʻu, Hawaiʻi.* (Mutual Publishing. Honolulu, HI: 1998), 124.
[91] Joseph G. Mullins. *Hawaiian Journey.* (Mutual Publishing Company. Honolulu, HI: 1978), 53.

When reflecting the teaching and learning methods in ancient Hawaiʻi, as students, children were taught from four distinct divisions as seen in Figure 20.[92] Each division provided education and instructions at different socio-political and economic levels within Hawaiian society. Some children received training from master artisans and family members, attended special schooling, and were separated by genders according to economic activities in the community as reflected in Table 7. These styles of teaching and learning fostered a high rate of success at the same time a low rate of failure. The body, mind, and spirit combined within this learning system were cared for and respected every aspect of living.

Therefore, an indigenous educational framework in architecture enables a rich discussion and the ability to make a positive impact on Native Hawaiian students. This researcher proposes to utilize the current architecture program integrating traditional Hawaiian architecture and educational methods into a synchronized curriculum. One example is an introductory course on the built environment where ahupuaʻa concepts inform students on how Native Hawaiians sustained themselves and respected the resources on the land.

Table 8. Traditional Hawaiian Educational Divisions[93]

DIVISIONS	INSTRUCTIONS	INSTRUCTORS
1. Immediate family	Children taught to observe, listen, and practice	Kūpuna
2. Gender separation	Male and female children were taught separately	Extended family members: male to male and female to female
3. Formal school	Special training of boys to study warfare, art, dance, fishing, and agriculture	Special tutors in each category
4. Specialized trade	Special training in the medicine, hale, heiau, canoe builders; medicinal plants	Kahuna in medicine, kahuna architect, kahuna specialist in laʻau lapaʻau [medicinal plants]

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[92] Rubellite K. Johnson. "Education Perspectives: History of Education: The Teachers. Vol. 20, Number 3, Fall 1981: 50th Anniversary of the College. University of Hawaiʻi. pgs. 3-9

Table 9. Hawaiian Epistemology[94]

Hawaiian Term	Meaning	Relationship	Application
Moana	Ocean	Spirituality & Knowledge	Cultural context of knowledge
ʻĀina hānua	Land	That which Feeds	Physical place & knowing
Lani ulu	Sky	Cultural Nature of the Senses	Expanding empiricism
Pōhaku lana	Stone	Relationship & Knowledge	Notion of self through others
Pūnāwai	Water	Utility & Knowledge	Ideas of wealth and usefulness
Malanai	Wind	Words & Knowledge	Causality in language
Wao akua	Forest	The Body/Mind Question	The illusion of separation

3.1.5 Hawaiian Epistemology

Hawaiian ways of knowing, learning, and doing are distinct ways that are recognized by Native Hawaiian scholar and advocate, Manulani Aluli Meyer who coined the term, "Hawaiian Epistemology" in her dissertation, Native Hawaiian Epistemology: Contemporary Narratives. In her research, Manu Meyer found that the following relationships reflected a Native Hawaiian way of knowing (See Table 9):

One example of how Hawaiian architecture could perpetuate a Native Hawaiian epistemology is seen in Meyer's discussion on the theme of ʻāina hānua. ʻĀina hānua represents the land and the connection between the physical place and knowing.[95] By perpetuating this epistemological value, recognizing the role of the land signifies the importance of a Hawaiian sense for a place-based learning. However, the cultural significance of the land is vital for design studios but as practicing responsible stewards of the land, it is a way to give fair balance of a Native Hawaiian epistemology at the school of architecture.

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[94] Manulani Meyer. "Native Hawaiian epistemology: Contemporary narratives." PhD Dissertation in Education. (Harvard University, MA: 1998), xi-v.
[94] Manulani Aluli Meyer. "Our own liberation: reflections on Hawaiian Epistemology. *The Contemporary Pacific.* 13(1): 124-8.
[95] Manulani Meyer. "Native Hawaiian epistemology: Contemporary narratives." PhD Dissertation in Education. (Harvard University, MA: 1998), 147.

In her research, Meyer further discusses that trying to adjust to an entire colonial system within the same non-Hawaiian environment does not encourage Native Hawaiian epistemology. Instead, it becomes problematic to fight for a Hawaiian identity that is designed to "assimilate students into higher hegemonic context" that is predominantly non-Hawaiian.[96] Meyer also recognizes that one system of understanding should not be used over another but that instructors should offer fair and equal time of a Hawaiian epistemology.

3.1.6 Choosing Wisely

Student architects are taught to design, draw, and present their final product in a 3-dimension computer generated model and display boards that are viewed by their peers and judged by professional architects. It is important that the design concept and verbal descriptions are synchronized.

Hawaiians understood how important words were, because words had mana [spiritual power] that came from the gods and connected to hana pono [right action] that was practiced. One story that reveals the importance of choosing words wisely is the story of Nāmakaʻeha (sore eyes) found in the Fragments of Hawaiian History by John Papa ʻĪʻī. And so, the story is told:

> The children who lived on the south side of Richards Street were in the habit of making sport of Nāmakaʻeha mocking him until he was on the point of losing his patience. One day, the children who taunted Nāmakaʻeha, together with ʻĪʻī, went to his place. They called him a one-eyed haole with a lop-sided mouth and other name calling that he chased them angrily. The other children fled but ʻĪʻī stood still and let himself be caught. When asked, "Were you one of the boys who reviled me while I was busy with my work?" ʻĪʻī answered, "I was standing with them but I did not say these things of you. I have done no wrong to make me run away with them. I only joined them to see what they did to you. I have no idea of hiding myself from you." His answer satisfied Nāmakaʻeha. Later, the boy and the sail maker became fast friends.[97]

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[96] John Papa ʻĪʻī. *Fragments of Hawaiian History.* Translated by Mary Kawena Pukui. Edited by Dorothy B. Barrère. (Bishop Museum Press. Honolulu, HI: 1959), 61.

Thus, choosing words wisely can determine a positive or negative outcome when addressing family, friends, or presenting a design to a client, community, or jury.

Finally, in a Hawaiian worldview, the seat of thought, intellect, and knowledge is found in the small intestines of men and animals, the na'au.[98]   It is the central space of the body from which knowing is not separate from Hawaiian feelings. They are both connected to the spiritual acts of acquired knowledge such as education, learned skills, and other approaches. Knowledge is significant when used, hence, the importance of practice and engaging with the Native Hawaiian and local communities in design work.

3.1.7 Looking Back

The marriage of Hawaiian epistemology and indigenous theoretical framework enabled a rich discussion and the ability to make a dramatic and positive impact on architecture education for all architecture students. By working within the confines of the institutionalized walls of academia, our understanding and perceptions are limited. However, when we struggle to create new spaces for our work that are informed by a Hawaiian epistemology that capture all of the cultural senses, only then we able to recognize and contribute to a higher understanding. As we look at the multiple educational approaches and life experiences, we are able to create solutions and merge new approaches that help move us toward developing a Native Hawaiian undergraduate architecture model for education. As we review all the elements from multiple viewpoints and understanding the modest approaches from which we see the current program, we honor our kūpuna and are inspired to prepare future architecture students as responsible stewards of the land. Through our openness to traditional Hawaiian structures and methods of education, we have the ability to be representatives of pono- looking at architecture through the eyes of the next generation.

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[98] Manulani Aluli Meyer. "Indigenous and Authentic: Hawaiian Epistemology and the Triangulation of Meaning." (University of Auckland Sabbatical Paper. 2006), 9.

MOKUNA ʻEHA:

CHAPTER 4
METHODOLOGY

"Strengthening the Basket"---
Hoʻoikaika ka ulana ana o ka ʻeke

4.1.1 Introduction

This chapter covers the research methodology and design of this study.   Since the School

of Architecture (SoA) is the central location, it begins with a description of the site surroundings

and an overview of the current professional degree program. As an architecture doctoral

candidate, this researcher also offers an overview in this thesis.   In addition, this chapter

provides the rationale for using qualitative research methodology as well as the process for data

collection and analysis.

4.4.2 The Setting: School of Architecture Background

Facing west on the University Avenue at the Mānoa campus' edge stands the only School

of Architecture in the State of Hawaiʻi. Shaded by the beautiful canopy of monkey pod trees, this

three-story building provides covered parking and two-stories of classrooms and administrative

offices. Completed in 1994,   this building enclosed the quadrangle with its main entrance facing

Hawaiʻi Hall, the oldest building on the campus.[99]   The school began in 1946 with a Pre-

Architecture Program offered in the College of Applied Science. Since 1965, the degree program

has evolved from a four-year program Bachelor in Pre-Architecture to a Master of Architecture

(MArch) which in 1972 received the initial accreditation by the National Architectural

Accreditation Board (NAAB). In 1980, the School conferred and established the first Bachelor of

Architecture (BArch) degree which was led by Dean Elmer Botsai. In 1996, the School received

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[99] Quadrangle aka "the quad" (rectangular yard) is flanked by Hawaiʻi Hall as the heart of the campus
flanked by George, Dean, Gartley and George Halls.

full-term NAAB reaccreditation for its existing BArch first professional degree and its MArch first professional degree.

In 1999, a seven-year, 212-credit first professional Architecture Doctorate (ArchD.) degree program was approved by the University Board of Regents to replace the existing MArch and BArch degree programs. In 2004, the program was accredited by the NAAB. The School was the first in the nation to offer an accredited professional architecture doctoral degree. In 2008 at the request of the NAAB, the School changed the title of the degree from Arch D. to Doctor of Architecture (DArch.). Clark Llewellyn assumed the deanship in the summer of 2007.[100]

Since its inception in 1999, the number of Native Hawaiian students graduating from the doctoral program has increased steadily. According to the university's Institutional Research Office (IRO), the first two Hawaiian male students graduated from the doctorate program in 2002. Within the last 15 years, SoA has grown by leaps and bounds from its humble beginnings. The overall student enrollment has steadily increased from 240 students to 370 students as well as the cohort of part-Hawaiian students from 14 to 48 from Fall 1999 to Fall 2010.[101] SoA graduates approximately 30 students every academic year.

This program offers architecture students opportunities to extensively research a particular area of interest, supported by interdisciplinary coursework and one or two semesters of professional studio. In addition, one of the special highlights for scholarly and research activity integrated with the activities of the professional architecture, engineering, planning, construction or development firm is the Professional Studio-the Practicum. The choice of selecting a major U.S. firm or international firms in London, Tokyo, Hong Kong, San Francisco, and others listed or participating in an alternative-professional studio experience with local firms is up to the

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[100] http://www.arch.hawaii.edu Access: January 22, 2012.

architecture student. This program is intense but by keeping a steady pace and taking advantage of shared knowledge by faculty, staff, and professionals, the rewards to students are priceless.

This researcher began her architecture studies at the University of Hawaiʻi at Mānoa in Fall 1998 and became a doctorate student in Spring 2000. During these past fourteen years at the SoA, this architecture student saw the ending of the BArch program and then became socially, academically, and politically involved with the Architecture Doctorate degree program. With the guidance of the architecture staff and faculty, this researcher excelled in the undergraduate studies components and completed certification in Historic Preservation while participating in projects conducted by community based organizations. Thus, throughout the years and experiences at SoA, this researcher chose to explore different areas of study in which Native Hawaiian undergraduate students could connect with Hawaiian architecture education and continue in higher education through the professional architecture degree program.

4.4.3   *Methods of Data Collection*

This thesis used the employment of three qualitative research tools that allow the researcher to collect information relevant to this thesis. First, a department school-wide electronic survey was forwarded to architecture students who listed their e-mail addresses with the school of architecture administration; second, an interview process and third, participant observation. The qualitative method afforded this researcher with the ability to uncover processes such as information on Hawaiian architecture. Based on Professor John Creswell and author of *Qualitative inquiry and research design; choosing among five approaches* describes qualitative research as: "An inquiry process of understanding is based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a

natural setting."[102]

This approach for the research is appropriate and allows the researcher to freely explore and draw conclusions based on the information gathered from the survey and informants. For this thesis, the research centered on issues of Hawaiian architecture education, and, specifically, how a Native Hawaiian undergraduate architecture concentration model in education can emerge at the SoA. Given the nature of the inquiry, qualitative methodology was the most appropriate means of data collection for this study. So, the primary method was an electronic survey to all SoA students and interviews supported by observation and praxis involving architecture students and Native Hawaiian community-based organizations.

4.4.4 Interviewing

Described as "a conversation with a purpose", interviewing is a tool by which researchers can acquire a vast amount of information in a relatively short amount of time. [103]   It's also a means to establish an understanding of the individual's life, experiences, and stories in their own words. The informal approach was considered, with follow-up calls and e-mails to the participants clarifying their choice of place for the interview. This process was the appropriate data collection method for this study. By using various interviewing techniques, this researcher was able to gather information from the participant's own reflections using their own words. [104] The Native Hawaiian student had an in-depth interview and kūpuna [elders] had unstructured and open-ended questions that are few in number and intended to elicit views and opinions from the participants.

4.4.5 Native Hawaiian Student Interviews

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[102] John W. Creswell. *Qualitative inquiry and research design; choosing among five approaches.* (Sage Publications. Thousand Oaks, CA: 1998), 15.
[103] Robert Kahn & Charles Cannel. *The Dynamics of Interviewing.* (John Wiley. New York, NY: 1957), 149.
[104] Erin Kahunawaika'ala Wright. "Education for the Nation: Forging Indigenous Hawaiian Identity in Higher Education." Phd. Dissertation. (University of Hawai'i. Honolulu, HI: 2003), 63-6.

For in-depth interviews, Native Hawaiian students from the School of Architecture were audio taped for the duration of one hour. Each participant was furnished with a cover letter that explained the study and the Human Subjects waiver, a Human Subjects waiver form and an interview protocol prior to the interview (Appendix 5). The interviews took place at various locations, due to the option provided to the participant to be interviewed in a place of their choice. The following questions were used in the interview protocol that guided the conversation:

1. State your name, undergraduate or graduate student.

2. Where are you from? (Describe your upbringing)

3. Describe your primary and secondary schooling experiences?

4. Why did you choose architecture as your major?

5. Has the School of Architecture shaped your education and professional decisions: If so, how? If not, what influenced your academic and career choices?

6. Do you feel traditional ways of teaching, cultural values, and traditions should be taught in the schools? Why?

7. Do you have any other comments that you would like to share at this time?

The Native Hawaiian student came from a background in art and computer technology. Born and raised on Oʻahu, the subject's passion was supported by a family network. Graduating from a public high school, this Native Hawaiian student graduated with a professional degree in architecture. Finally, in the in-depth interview process, this Native Hawaiian student was audio taped for about an hour conversation and conducted at the school.

The selection process for participants will be discussed in chapter five: the Data Analysis.

4.4.6 Kūpuna Interviews

The participants were not formally interviewed but, rather engaged in free-flowing conversations. Participants and researcher sat and talked story before the interview. These

informal conversations provided the researcher with adequate information from their life experiences and memories form limited views on traditional Hawaiian educational methods. An advantage to this method was the use of open-ended questions and probing that gave architecture students and kūpuna the opportunity to respond in their own words, rather than encouraging them to choose from fix responses. They were able to provide meaningful and culturally relevant responses about themselves that was rich in nature and at times, surprising to this researcher. This method also provided this researcher with the flexibility to review their initial response by asking why or how questions. An important step in this process for this researcher was to listen carefully to what the kūpuna were saying and engage with them according to their own personality and style. Verbatim or key-word note taking allowed this researcher to identify themes that emerged in multiple interviews and data gained through other methods employed. This method encouraged them to elaborate on their answers with minimum interruption.

The following questions were used in the interview that guided the conversation.

1. What is your name and how old are you?

2. Where are you from? (Describe your upbringing)

3. Describe your primary and secondary schooling experiences? If you did not attend school, describe you teaching and learning experiences.

4. Did you learn from traditional teachings from your grandmother, grandfather, etc.? If so, what were these teachings and do you practice them today?

5. How did these teachings shape your family, profession or educational decisions?

6. Do you feel traditional ways of teaching, cultural values, and traditions should be taught in the schools? Why?

7. Do you have any other comments that you would like to share at this time?

Generally speaking, the five participants came from diverse backgrounds. There were three women and two men whose age ranged from 72 to 84 years that were interviewed. Four of

the participants were Native Hawaiians and one participant was non-Hawaiian. Specifically, three was from the windward side of Oʻahu, one from West Oʻahu and one from north shore Oʻahu—very different communities in terms of urban/rural settings and general socio-economic status of the area. Four participants were born and raised on Oʻahu, and one participant was born and raised on Maui. Two participants lived on leased land from the Department of Land and Natural Resource lands with their families and the other three lived on privately owned land.

Educational experiences varied as well. All participants attended public primary school while one attended and graduated from a private school. Two participants graduated from college earning a bachelor and another, a master's degree. Two participants graduated from public high school and one dropped out at 16 years. Each participant had very different backgrounds and personal stories and experiences that were reflected in the following chapter. Finally, in the informal interview process, these kūpuna were audio taped for about an hour conversation and their interviews were conducted at their home and in various locations.

MOKUNA 'ELIMA:

CHAPTER FIVE

DATA COLLECTION AND ANLYSIS

"Ike ana mai kākou"
Learning together

5.5.1 Introduction

Mokuna 'Elima looks at 69 architecture students responding to the author's survey, yielding a completion rate of 29%. The 240 valid emails provided by the SoA offered the data for the student's opinion. A truer response rate cannot be precisely calculated because information on how many valid email addresses are in the university's database is unavailable. Nonetheless, they responded to the survey questions on their experiences or introduction to Hawaiian architecture and cultural activities.

5.5.2 Background Surveys

In 1991, a mixed group of community organizers, health professionals, educators, and cultural practitioners assembled to discuss research issues regarding cultural impact assessment reports in Native Hawaiian communities. This particular method utilized interviewing from an oral history perspective where the researcher engaged in understanding as fully as possible the experiences of the narrator. This process allowed the researcher to ask questions more thoroughly regarding their life experiences. The purpose for choosing this multi-method approach allowed the researcher to compare collected data from different sources in different ways. These methods are interconnected and reinforced by traditional Hawaiian teachings (See Figure 21).

5.5.3 Data Collection

The data collection tool was an electronic student-wide survey with 10 questions. A Likert-Type Scale ranging from "a great deal" to "none at all" was used to assess architecture

students' possession of identifying Hawaiian culture consisted of five items. The survey was not numbered for tracking purposes but responses were submitted individually. A total of 69 out of 240 emails to architecture students who completed the surveys received a response rate of 29%,

5.5.4 Descriptive Analysis

Student classification: 44 undergraduates (63%) and 25 graduate students (36%) responded. 55 responded as non-Hawaiian students (79%) ranking high to a low of 14 (20%) respondents who were part-Hawaiian. Gender, age, and ethnicity were not part of the survey questions.

Hawaiian Cultural Practices, Language, and Sacred Sites

- 35 (50%) Respondents had little participation in Hawaiian cultural practices to 4 (5%) indicated they have participated a great deal.

- 36 (52%) of students have not visited a Hawaiian sacred temple but 5 (7%) of the student respondents had a great deal of contact.

- 25 (36%) Respondents said they had not used Hawaiian terms to describe their studio projects and 4 (5%) indicated in a similar manner.

- 31 (44%) of students responded to having a little teaching on Hawaiian architecture and 18 (26%) had none at all.

- 19 (27%) Respondent's most likely want to learn Hawaiian architecture and 5 (7%) indicated they do not want to learn at all.

- 25 (36%) responded to no Hawaiian construction terms were used and 3 (4%) indicated a great deal of attention.

- 20 (28%) responded using Hawaiian architecture practices and methods and 5 (7%) indicated they do not want use it at all

- 20 (28%) moderately to 8 (11%) extremely expect implementing Hawaiian architecture.

As suggested from the above findings, there is a lack of knowledge on Hawaiian traditions and activities. The objective of this on-line all-architecture student survey was to determine what students knew or didn't know about Hawaiian culture and traditional Hawaiian architecture. The results of this survey helped to prepare a Native Hawaiian undergraduate architecture curriculum. Through these means, architecture students will be able to identify and describe traditional Hawaiian architecture such as heiau, hale, fish ponds, taro fields, and the different functions of these structures. In addition, they will learn Hawaiian ways of sustainability and designing for Hawaii's landscape.

It was evident that architecture students are in favor to develop and establish a Native Hawaiian undergraduate architecture concentration that encourages students to continue to the professional degree program. Of the 69 out of 240 emails, 29% architecture students completed the informational survey indicating promising support. Drawing conclusions from the survey results is useful and necessary in several different areas of Hawaiian architecture education.

5.5.5 The Participant

One Native Hawaiian female graduate architecture student participant was interviewed. As a young (27 year old) Native Hawaiian female, she discussed her experiences while attending the school of architecture. Completing the doctorate program on schedule, she was able to encourage and help other Hawaiian students realize their potential to complete the program. As rigorous and unforgiving as the program may be at times, the focus of the program in the final stages is on researching a particular topic. Depending on one's writing skills, designing and preparing to write a thesis was not always easy. Her experiences engendered confusion,

depression, and a feeling of "I don't know how to." Although the program offers a course in

architecture research methods, students are not fully informed regarding the writing process.

Accordingly, the subject had knowledge of students giving up, being too embarrassed to

ask for help, or not knowing what questions to ask to get help. From a Hawaiian perspective,

there are cultural reasons for these actions. Hawaiians have been taught to watch, listen, and keep

your mouth shut.[105] This sense of giving and receiving supports the idea that relationships and

belonging are primary actions in traditional Hawaiian culture and society. Determined to become

an architect from a young age, she pursued her dream career. Drawing and technology are her

passion. Coming from a very supportive family network, the subject was able to overcome many

obstacles and stay the course. This researcher is very grateful for her opinions regarding the

school's new direction with the program.

With only one student interview, the researcher suggests for future students that in-depth

interview of graduate students should be scheduled and conducted prior to graduation. Following

up with e-mails and phone calls, future researchers are encouraged to help other Hawaiian

students during the writing process of their thesis. The importance of support, encouragement,

and commitment toward completion is vital for the success of doctoral candidate architecture

students.   This participant provided helpful insights to the writing process of the thesis, its

challenges, and sensitivity to this subject's personal struggles.

5.5.6 Ka Poʻe Kahiko

This researcher selected a set of five (5) active and diverse kūpuna to provide additional

information on ways of traditional teaching and learning. Three women and two men were

interviewed whose ages ranged from 72 to 84 years old. Four were from Oʻahu, specifically

Haleiwa, Waialua, Kahana and one was from Puʻunene, Maui with very different communities,

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[105] Malcolm Nāea Chun. *No Nā Mamo: Traditional and Contemporary Hawaiian Beliefs and Practices.* University of Hawaiʻi Press. Honolulu, HI: 2011), 84-5.

socio-economic status, and active status in the communities. Four participants were of Hawaiian ethnicity and one non-Hawaiian but Hawaiian at heart, mind, body, and soul. For this study, the three females are kūpuna wāhine 1-3 and the men, kūpuna kāne 1-2.

Question: What do you remember about going to school and how did you learn from your teacher?

Kupuna kāne 1: (80 years) I was born and raised in Puʻunene, Maui during the sugar plantation days.   They had Japanee (Japanese) camp, Potagee (Portuguese) camp, Haole (Caucasian) camp, Chinese camp, and Hawaiian camp. No one bothered the Hawaiians

because this is their land. We all went to school, one classroom, one teacher, and one book.   We lived in a small plantation house with one bedroom kitchen, bathroom living room and laundry room. The house was red. My dad was a crane operator and worked on heavy equipment.

I didn't pay attention at school but my dad taught me how to raise rabbits. My job was to feed them milk weed. One day I was so busy playing that I gave the rabbit's ti-leaf. My dad was so mad with me. Another time, my dad taught me to mind your own business when the men on the horses, the luna [supervisor] would come and check on the people. Don't bother them. Later, we moved to Honolulu and went to Lanakila School, Kuhio School, Washington School and McKinley School. I dropped out of school at 15 years old and went to the beach. That's where I learned about fishing, surfing, paddling canoe, working, and having a good time. One Hawaiian family when teach me plenty about the ocean.

Kupuna kāne 2: (83 years) Eh, I was born in Waianae then move to Haleiwa. I don't remember too much about school except that my mom and dad taught me to make fishing nets, go fishing, and then go home eat. I went to Nanakuli School. Back then,

nobody like go school. We didn't have very much money so as kids we picked keawe beans, put 'um in the bag and sell to the farmers. They used it to feed the pigs and cows. Lucky if we make 5 cents. I remember that we were so poor I didn't have any slippers or shoes to wear. Later on, I moved to Haleiwa where I worked for the County, surfed, fished, and raised my family. Not too much to say but I worked hard and did my chores before my mom and dad came home. Neva study much just work.

<u>Kupuna wahine</u> 1: (72 years) Well darling, I don't remember very much about school because we had a big family. The girls had to clean the house, wash the clothes, and make sure we helped with the cooking. My mother, well, she always busy doing something and she made sure us girls stayed home and cleaned the house. Not too much to say.

<u>Kupuna wahine 2</u>: (81 years) I was born in Honolulu on Vineyard Street at my tutu man's house. He was a Royal guard for King Kalakaua. My tutu man was very English, prim and proper when eating dinner. The table was set with plates, napkins, and silverware. But I enjoyed my mother's family in Moanalua. We would go and catch o'opu, opae, and other fishes in the river. She had a big kitchen with her poi bowl on the table. I really appreciated my Hawaiian family because they had a relaxed life and lived off the land. She even took me to pick limu, catch fish, kūpe'e, pipi'i. My tutu lady would make me sit by her when she wanted to teach me something. She tell me listen, just listen and keep your mouth shut. Then she would ask me if I remember what she told me. I would repeat to her. I graduated from Kamehameha Schools and attended the University of Hawai'i for two years. When I had just gotten married, a post master position opened up at the Hauula post office. So, I applied and got the job. I am retired now and play music that is, piano or organ.

I play for parties, weddings, funerals, oh, lots of funerals and very active in the community.

Kupuna wahine 3: (72 years) I was born in Honolulu and grew up in Makiki and Kahana where our family lived. My father loved working in the yard where he taught me to live off the land. We planted taro, sweet potato, vegetables, and fruits. He always kept the yard looking good. My dad also built a home for us from a military barracks. My tutu lady taught me to be strong and how to fish. She was a strong lady in the spirit and went to the loʻi and river to fish and to the ocean for heʻe [octopus]. She owned a lot of land in Punaluu but lost it because she couldn't pay the taxes. I retired from the hotel industry and graduated from the University of Hawaiʻi. My whole world turned upside down when after 16 years of marriage, my parents got a divorce. It was heart breaking. After raising my own family, Kahana was home. Because of my dad and his fighting spirit, we were able to live in Kahana Valley. He was strong, kind, tough, and very loud. My mother was kind and a gentle hula teacher.

5.5.7 Interview Conclusions

The interviews while not a statistical sampling reinforced several issues as noted from the literature review. Both Native and non-Native respondents of the survey and interviews have expressed that learning the Hawaiian culture reflected the culture it serves and provide a setting where new knowledge and skills can be linked with relevancy to real life situations. In addition, Hawaiian cultural values, beliefs, histories, spiritual practices, economy and landscape are being woven into the western educational systems as seen, for example, the Hawaiʻinuiākea, School of Hawaiian Knowledge. As well, this thesis can help in placing learning goals, objectives, and

experiences into a culturally-relevant framework that transfers learning so that students can make a positive impact within the Hawaiian communities.

5.5.8 Summary

In this chapter, the student–wide electronic survey was the primary data collection completed by architecture students within the School of Architecture in February 2011. The survey was the first step toward planning to develop a Native Hawaiian undergraduate architecture curriculum. Participation in the survey was voluntary for students and provided by Monkey Survey. The findings come from data obtained from the student-wide survey, one-to-one interviews and observation in relation to the research questions.

The finding presented suggests that students who responded to the survey indicated that more than half of the students did not participate or engage in Hawaiian culture activities. Yet responses to most likely wanting to learn from Hawaiian architecture and methods ranked high among students. It seems the architecture students and SoA have two purposes which affect how students interface with the host culture. To help foster a positive student development, the school environment has the potential to be truly transformative, particularly for Native Hawaiian students placed at risk for education underachievement or failure.

The 25 respondents (36%) indicated that were not aware of using Hawaiian words to describe their studio project or having little information taught to them on Hawaiian architecture. While 28% of the 19 respondents were mostly interested wanting to learn more about Hawaiian architecture, 7% indicated they would not use these practices and methods at all. As a result, architecture students if given the opportunity by the school administration to introduce Hawaiian architecture, the expectations for implementing the curriculum were high from student responses.

The result of the survey raises the issues on learning more about Hawaiian culture, architecture, and construction methods. It is a significant time for the school to infuse, design

and develop a Native Hawaiian undergraduate architectural concentration connecting architecture students to the broader community, especially the Hawaiian communities. Throughout this research, kuleana or one's individual right, responsibility or privilege to help a group encouraged this researcher to think about how architecture students will use their skills and talents to contribute to the advancement of the Hawaiian community.

MOKUNA 'EONO:

CHAPTER 6

HAWAIIAN ARCHITECTURE EDUCATIONAL CURRICULUM

"Let us work together"
E alu like mai kakou

6.6.1 Introduction

Hawaiian cultural practices and perspectives have much to contribute to architecture literacy and to the environment of understanding human interactions with the natural world. Living within the ahupua'a, a land division, typically extending from the mountain to the sea, Hawaiians exchanged products from the mountain with those living towards the sea. They had their own understanding of plants, stars, animals, environment, migration and knowledge. From their perspective, humans, living things, land and sea form an interdependent, ancestral, spiritually infused system.

In following this theme, the University of Hawaii's vision is dedicated to serve with aloha, the local, national, and international communities. As a land, sea, and space grant university, they have adopted the Native Hawaiian values rooted in the concepts of kuleana [responsibility], 'ohana [family], and ahupua'a [land division] that serve to remind us our responsibilities to family, community, and the environment. Fostering creative and critical thinking, and promoting students' scholarly growth and success is one way Hawaiian culture can be seen as bridging classroom theory and practice.

The School of Architecture is at a crossroad in curriculum development. The desire is to incorporate Hawaiian content, knowledge, ways of knowing, and perspectives within the undergraduate layers in the current program. The vision is to inspire transformative design at the global scale with preeminence in the Asia-Pacific region recognizing the privilege and

responsibility to address cultural, environmental, and social diversity.[106] In shaping the future

and preserving a heritage, this researcher believes the proposed curriculum allow all students to

learn and practice stewardship in Hawaii's unique environment. The coursework would build

upon a foundation of traditional cultural practices reflecting a Hawaiian connection to the land,

ocean, communities, and its people.

6.6.2 Proposed Curriculum

The proposal for a Native Hawaiian undergraduate pre-architecture curriculum addresses

three areas: 1) integrate cultural values of story-telling, memorization skills, and cosmological

systems with the current program; 2) propose an indigenous architecture design concentrated

work with hale and temple structures; 3) language, 4) cultural landscape, and 5) introduce

architecture electives concentrating on Hawaiian traditions and cultural values.   Some of these

values emphasized throughout these courses are key principles of indigenous support and positive

character.   The approach focuses on aloha [respect], kōkua [helping], laulima [cooperating],

'ohana [family], mālama 'āina [caring the land], kuleana [responsibility], and pa'ahana [hard

working]. This type of learning builds relations, relevance, and rigor stressed in traditional

Hawaiian families that can benefit all students to be successful in the schooling environment.[107]

Within the elements of the Hawaiian belief systems, the indigenous connection to nature, self,

and spirit are presented in the proposed curriculum.

6.6.3 Passing on Traditional Knowledge

In ancient Hawai'i, learning was honored. The formal and informal education was an

extensive system of learning from nature to cultural values to participating in family and

community activities. Those who were intellectually gifted were constantly challenged to higher

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[106] http://www.arch.hawaii.edu/vision   Access: January 31, 2012.
[107] Maenette K.P. Ah Nee-Benham. *Indigenous Educational Models for Contemporary Practice: In Our Mother's Voice: Vol. II.* (First Published, New York, NY: 2008), 149.

and higher levels of competence and knowledge.[108] In order for those to develop talents and

learning skills to a higher level, a person had to be trained as a child in a chiefly court or as a

candidate for the Kahuna School [priest]. Pukui, Haertig, and Lee describe the kūpuna as

knowing that by observing a child or young adult, one learned; by listening, one committed to

memory what was being taught, and by practicing, one would master the skill.[109] This was also

true of the children who were raised in the traditional ways by their grandparents and those living

in the rural communities. The kūpuna continued to teach the traditional customs and knew the

value of periodic testing and assessment so that children of their craft could know their strengths

and weaknesses. They learned by example and testing allowed for corrections and improvements

to be made for navigators to navigate a canoe or builders to build a hale. Part of this education

was passed down through stories, proverbs, riddles, and through formal chants because

Hawaiians did not have a written language.

The haku mele [chant master] was a person who composed and performed recitals of

traditions for the people of their time. They were the scholars who studied the content,

memorized it, reflected on their selection, and discussed it with their peers. To insure these chants

were passed down to the next generation, the haku mele was also judged by the kaka ʻolelo.

These judges may have been a person or a group of people judging the nature of the ancient oral

tradition. They corrected things according to their decisions and at times discarded things that

were not correct with traditions. As a result, these people chanted for a living and created a

family of kākau ʻōlelo.[110]

One chant in particular is the Kumulipo, a 2,000 line cosmogonic genealogy that tells the

story of the Hawaiian world of creation and their world view and place within the universe. In

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[108] Michael Kioni Dudley. *Man Gods, and Nature.* Introduction by John Dominis Holt. (Nā Kāne O Ka Malo Press. Honolulu, HI: 1990), 5.
[109] Mary Kawena Pukui, E. W. Haertig, and Catherine Lee. *Nānā I Ke Kumu. Vol. II.* (Queen Liliuʻokalani Children's Center. Honolulu, HI: 1972), 48.
[110] Martha W. Beckwith. *Kepelino's Traditions of Hawaiʻi.* Translated and edited by Martha Beckwith. (Bishop Museum Press. Honolulu, HI: 1932), 131-2.

this particular chant, Papahānaumoku [Earth Mother] and Wākea [Sky Father] are responsible for creating the islands as well as a daughter, Hoʻohōkūlani. Within the story is Hāloa, the genealogy of the islands and the Hawaiian people. Hāloanakalaukapalili was the eldest child of Wākea and Hoʻohōkūlani. He becomes the kalo plant which has sustained the Hawaiians for thousands of years and his brother Hāloa II becomes the first chief as well as an ancestor for the entire Hawaiian race. This story is used to illustrate the kuleana of Hawaiians, mālama ʻāina [care for the land] and aloha ʻāina [respect the land] because it provides the bare necessities of life.[111] It tells of everything in the natural world---night and day is created and from this emerge the ocean, organisms, coral, the land, plants, animals, and the gods all enter the world before humans. This chant represents an evolutionary theory which is central to Hawaiians understanding man's place in the world and his relationship to the things of the world.

In passing down traditional knowledge, the interest for this researcher lies in the 14th verse of the Kumulipo because it listed the name of the stars such as Orion, the Milky Way, Jupiter, Pegasus, and Antares. In ancient and modern day, these star systems continued to guide Polynesian navigators as they travelled between islands. They were able to determine the azimuth, the rising and setting position of the sun and moon.[112] The Hawaiian fishermen were also known to check their zenith star to determine the water levels when fishing at night. In addition, the kahuna kuhikuhipuʻuone [architect] would watch the sun and moon to help him to determine when to build a heiau and where on the site. The sky became the space above the heiau where he watched the movement in space and time like a Hawaiian compass of sacred space.[113] Malo named nine levels of the sky above a man's had, reaching higher and higher into the dome of heaven. The sun, moon, and stars moved across the dome at the highest level, ka lani

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[111] http://www.apps.ksbe.edu/olelo/essential_documents   Access: February 22, 2012.
[112] RubelliteKawena Kinney Johnson. "The Kumulipo Mind: A Global Heritage in the Polynesian Creation Myth." (Copyright Rubellite K. Johnson. Honolulu, HI: 1981), 123-4.
[113] RubelliteKawena Kinney Johnson. "The Kumulipo Mind: A Global Heritage in the Polynesian Creation Myth." (Copyright Rubellite K. Johnson. Honolulu, HI: 1981), 134.

paʻa [the heavens]. Again, confirming that Hawaiians observed the sun set that sank into the sea and continued in a circular motion beneath the earth and rising again in the east on the next morning. Hawaiians had names for stars, the belts of the sea, various strata of the earth, measurements, house description, months, and seasons.

Students who are interested in attending the university are required to meet certain application requirements. These include completing a variety of high school courses, four years of English and other prep courses and taking the Scholastic Aptitude Test (SAT) or the American College Testing (ACT). Once students are accepted, they can proceed to register for the classes of their choice such as business, English, history, astronomy, navigation or architecture courses.

At the School of Architecture, a 6 week or an entire course is proposed for the Native Hawaiian undergraduate architecture concentration courses designed to introduce students to study traditional Hawaiian land divisions, history of sacred temples and hale [house], traditional construction systems with cultural practitioners, and a concentration pre-architecture studio. The proposed courses are as follows:

I. **Architecture 100: Introduction to the Built Environment (3)**

Course Description:
Exploration of human responses to place, climate, culture, communication, technology, and time, with emphasis on the impact of scientific knowledge and architectural design theory on history, culture, sociology, technology and time, with emphasis on the impact of scientific knowledge and architectural design theory on history, culture, sociology, technology and built form. Open to non-majors. **DS**.

Method of Instructions:
The informal lecture covers six weeks active student participation and use of visual aids and story-telling. Introduce students to the Kumulipo and the ahupuaʻa by going through an exercise where the island is divided along the watersheds to include all ecosystems.

Student Learning Objectives:

Before the completion of this section, students will be able to:

1. Better understand the significance of the Kumulipo as it relates to the land and ocean.
2. Identify the basic relationships between areas of an ahupuaʻa.
3. Identify the uka [upland] and kai [ocean] natural resources in an ahupuaʻa and its cultural significance in modern society.

Required Text:

Suggested: Williams, Julie Stewart. *From the Mountain to the Sea: Early Hawaiian Life.* Honolulu: Kamehameha School Press, 1997.

This book is available on line through Ulukau: The Hawaiian Electronic Library.

http://www.ulukau.org

Classroom conduct:

The word *Aloha* has many meanings. The one most often overlooked is *respect.* Students should be mindful that we will be learning **together**. Group discussions, questions, and the sharing of the student's manaʻo [thoughts] are excellent ways to stimulate diversity and understanding in all our ways of thinking.

Course Introduction: The Physical Environment

1. Hand out four charts of the Pacific Geography and Environment
2. Video: Ahupuaʻa, Loʻi and Loko Iʻa
   (Kelley, Marion: Dynamics of Production Intensification)

II. **Architecture 271: World Architecture and Urbanism A. (3)**

Course Description:

Investigation of the history and theory of architecture, the world's major cultural regions from early agricultural settlements to 1500 C.E. Investigation of architecture relationship to social, political, technological, and material forces. Open to non-majors

Method of Instructions:

This section of the course covers a six-week review of monumental architecture buildings that were ordered by Hawaiian cultural practices in a hierarchical system. Slide presentations, hand-outs, and readings provide a better understanding of the history of Hawaiian architecture.

Student Learning Objectives:

Before completing this section of the course, students will be able to:

1. Identify at least six major monumental ancient Hawaiian temple structures.
2. Identify and describe the connection of four major gods in Hawaiian religion.
3. Explain the social similarities and differences between the major and minor temples in ancient Hawaiian society.

Required Text:

Suggested: Becket, Jan and Singer, Joseph. *Pana Oʻahu: Sacred Stones, Sacred Land.* Honolulu, University of Hawaiʻi Press, 1999.

Your writing assignment will be from the required reading, *Pana Oʻahu: Sacred Stones, Sacred Land.*

III.   **Architecture 320: Introduction to Architecture Systems A. (3)**

Course Description:

Introduction to building systems including structural, environmental, life-safety, building envelope, building materials and building assemblies. Development of design skills with emphasis on elevating skills in assessing and selecting appropriate building systems. Arch majors only. A-F.

Method of Instructions:

For eight weeks, students will participate in individual and group projects, reading, writing, discussions, field trips, lectures, individual and group critiques of your work. All students are expected to work on projects and complete reading assignments and have new work, ready for review, at the beginning of each studio.

Student Learning Objectives:

Upon successful completion of the six week course, a student will be able to:

1. Identify the basic principles of architectural design and composition in Hawaiian culture.
2. Explain and describe architectural ideas and issues through drawing exercises.
3. Describe the analyses of traditional methods of design.
4. Distinguish between the architect's role in mediating culture, nature and technology.
5. Explain the construction technique similarities and differences of Hawaiian sacred temples.
6. Summarize the effects of urbanization on Hawaii's landscape.

References:

Textbooks, handouts, internet.

Sketchbook:

Each student will be required to maintain a sketchbook for this studio. At a minimum, you are expected to record notes and sketches from site visits, community meetings, lectures and all pin-ups and reviews. All students will provide hand sketches.

There are several reasons why a sketchbook is required in this course. One purpose of the sketchbook is to allow students not only to communicate design ideas but to understand why and how a building is shaped. In addition but not limited to, the sketchbook also allows students to:

1. Practice their drawing skills such as shading, line weight, composition, and perspective.
2. Record their visual inquiry be it a building, town, or drawing from life.
3. Process their free hand drawings to creative designs from an outline to the proportions that exists between the plan and how it works in section and elevations.
4. Investigate an early design.

5. Explore methods of construction

6. Use it as a method of recording and studying building typology.

7. Raise the awareness of cultivating careful and well directed skills of observation.

IV. **Ancient Hawaiian Sacred Temples: Concentration Architecture Studio (Arch 415) (6)**

Professional experience combined with scholarly and research activity occurring in an off-campus location with a focus on architectural concentration areas.

ARCH majors only. A-F only. Pre: 322, 342, and 371.

Method of Instructions:

The studio make use of proven methods of teaching architectural design, such as specific design assignments, desk criticism (individual and group), informal public pin-ups/reviews and discussions, formal design juries, lecturing, readings, and field trips.

Student Learning Objectives:

Upon successful completion of the course, a student will be able to:

1. Identify cultural sites on the land and in the water in Hawai'i.
2. Describe the role of these sacred temples in ancient and modern day Hawai'i.
3. Describe temple similarities and differences.
4. Distinguish between ancient and modern construction methods.
5. Identify at least one major heiau on each Hawaiian island, its history, function, and effects in a modern society.
6. Analyze the cultural values that arise out of Hawai'i and its relationship to the environment.
7. Explain and describe the connections of these temples and culture in Polynesia.
8. Be able to determine range of seasonal sun movement.

   Phase One (4 weeks): Research and Design Foundation.

   Phase Two (7 weeks): Schematic Design

Phase Three (4 weeks): Design Development and Presentation

Required Text:

Suggested readings: Valeri, Valerio. *Kingship and Sacrifice: Ritual and Society in Ancient Hawaiʻi.* Chicago, IL. The University of Chicago Press, 1985.

Malo, David. *Ka Moʻolelo Hawaiʻi: Hawaiian Traditions.* Translated by Malcolm Nāea Chun. Honolulu, HI. First People's Productions, 2006.

V. **Architecture Design: Concentration Required Coursework (Arch 3xx/4xx) (3)**

Required Coursework:

> CEE 472 Construction Management (IS Third College)
> ARCH 490 Special Topics: LEED

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education

> Geography, Planning, Anthropology, Sociology, Art (Studio)

Two additional Architecture Electives at the 3xx or 4xx level.

Method of Instructions:

The studio make use of proven methods of teaching architectural design, such as specific design assignments, desk criticism (individual and group), informal public pin-ups/reviews and discussions, formal design juries, lecturing, readings, field trips, etc.

Course Objectives:

This concentration seminar introduces and/or advances fundamental skills, knowledge, and attitudes necessary to build disciplinary expertise on how spirituality, culture, and architecture interact and affect one another. The class accomplishes this goal by studying hale architecture and the role that ancient Hawaiian thatched houses play in contemporary civilization, especially as it pertains to ethical, social, and political affairs. There are three teaching phases, each addressing learning objectives that build upon each other:

> Phase One (4 weeks): Research and Design Foundation.
> Phase Two (7 weeks): Schematic Design
> Phase Three (4 weeks): Design Development and Presentation

Required Text:

Suggested readings: Apple, Russ. *Hawaiian Thatched House: Use-Construction -Adaptation.* San Francisco, National Park Service, Western Service Center, Office of History and Historic Architecture, 1971.

Malo, David. *Ka Moʻolelo Hawaiʻi: Hawaiian Traditions.* Translated by Malcolm Nāea Chun. Honolulu, HI. First People's Productions, 2006.

Crouch, Dora P. and Johnson, June G. *Traditions in Architecture: Africa, America, Asia, and Oceania.* New York. Oxford University Press, 2001.

Student Learning Outcomes:

At the conclusion of this course, the student will be able to:

1. Understand and utilize fundamental concepts, arguments and examples related to the relationship among architecture, culture, and spirituality.

2. Find, interpret, and utilize relevant Hawaiian Sacred Space and Cultural Studies precedents.

3. Use and acknowledge own frame of professional, cultural, and spiritual reference in relation to others.

4. Gauge space, program, site, tectonics, and experience based on Sacred Space and Cultural Studies.

5. Describe the Hawaiian measuring system and heiau layout.

VI: **Architecture Concentration Required Coursework (Arch 3xx/4xx) (3)**

Required Coursework:

> CEE 472 Construction Management (IS Third College)
> ARCH 490 Special Topics: LEED

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education

> Geography, Planning, Anthropology, Sociology, Art (Studio)

Two additional Architecture Electives at the 3xx or 4xx level.

Method of Instructions:

The studio make use of traditional (and proven) methods of teaching architectural design, such as specific design assignments, desk criticism (individual and

group), informal public pin-ups/reviews and discussions, formal design juries, lecturing, readings, field trips, etc.

Course Objectives:

This concentration studio introduces and/or advances fundamental skills, knowledge, and attitudes necessary to build disciplinary expertise on how spirituality, culture, and architecture interact and affect one another. The class accomplishes this goal by studying taro terrace and fish pond architecture and the role that ancient Hawaiian sustainable structures play in contemporary civilization, especially as it pertains to traditional, social, and environmental affairs. There are three teaching phases, each addressing learning objectives that build upon each other:

Phase One (4 weeks): Research and Design Foundation.
Phase Two (7 weeks): Schematic Design
Phase Three (4 weeks): Design Development and Presentation

Required Text:

Suggested readings: McGregor, Davianna. *Nā Kuʻāina: Living Hawaiian Culture.* Honolulu. University of Hawaiʻi Press, 2006.
Kamakau, Samuel M. *Ruling Chiefs of Hawaiʻi.* Honolulu. Kamehameha Schools Press, 1851.

Student Learning Outcomes:

At the conclusion of this course, the student will be able to:

1. Identify at least four major cultural design features of the kalo patches.
2. Describe the terrace patterns of taro patches in Kahana Valley.
3. Explain relevant Hawaiian sustainable resources and cultural studies precedents.
4. Discuss the use of the loʻi as a commercial entity versus cultural uses.
5. Explain and describe the connection of language and culture in an ahupuaʻa.
6. Summarize the effects of modern society and traditional agriculture in Hawaii's society.

6.6.4 Coursework Outside of Architecture

As part of the Native Hawaiian undergraduate architectural education track, students are required to choose two of the four additional Architecture Concentration Electives at the 300 or 400 levels. The purpose is for students to understand the Hawaiian architectural system, its religious, political, and social issues.   This author suggests the following as a means to guide students through the Architecture Concentration Coursework:

1. **Religion 390 (3): Hawaiian Gods: Pele, Kamapuaʻa.** Introduce students to the traditions and practices related to two major indigenous gods that will be studied by the interpretation and analysis of primary texts from ancient Hawaiian times. This course provides the spiritual and physical connectivity of the ancient and contemporary religious practices to help students with the basic investigation of Hawaiian religion and their demi-gods.

2. **Geography 368 (3): Geography of Hawaiʻi 368** presents students with a detailed study of the people, and resources in Hawaii's regional, physical, and cultural geography.   This course explores how different cultures have responded to their physical surrounding and environmental setting.

3. **Hawaiian Studies 107 (3): Hawaii Center of the Pacific** introduce students to the unique aspects of Hawaiʻi and Hawaiian culture in relation to the larger Pacific, including origins, language, religion, land, art, history, and current issues.

4. **Hawaiian Language from Elementary to Advanced classes** introduce students to

listening, reading, writing, and speaking the Hawaiian language. Courses start with Hawaiian 101 and 102: Elementary Hawaiian, 201 and 202: Intermediate Hawaiian introduces reading Hawaiian text, Hawaiian 301 and 302: Advance conversation, and Hawaiian 401 and 402: Fourth Level-Hawaiian integrates advanced reading,

writing, and discussion in Hawaiian. Students are transcribing Hawaiian language tapes and translating Hawaiian into English and visa-versa.

As undergraduate students navigate their way through the required coursework, there is an excellent opportunity to register for Hawaiian Language classes as mentioned above. The intent is for students to gain a basic understanding of the Hawaiian language. These courses are intended to encourage new observations and discussions by Native Hawaiian students on developing responsible stewards of the land in Hawai'i through a Hawaiian perspective in architecture. After completing these courses, undergraduate students will be ready to continue through the professional architecture program.

6.6.5 Summary

In reviewing the required architecture coursework and listening to the experiences of these kūpuna and architecture graduate student, it is apparent that the survey proved relatively popular. Together with student architects and the School of Architecture, Hawaiian culture, traditional architecture structures, and history provide a context for Native Hawaiians to demonstrate their Hawaiianess. From the proposed courses being offered, Hawaiian perspectives are always evident. As one of the important elements in this Hawaiianess is kuleana. Kuleana refers to one's responsibility. This responsibility for Native Hawaiians lies in connecting with communities. And as part of the overarching responsibility, it is also SoA's kuleana to inspire this same commitment in their architecture students.

MOKUNA ʻEHIKU:

CHAPTER SEVEN

DISCUSSION AND RECOMMENDATIONS

"Completing the Basket"---
Hoʻopoau pono i ka ulana o ka ʻeke

7.7.1 Kipuka: An Opening for Hawaiian Architecture Education

In the Hawaiian language, kipuka is an opening used to designate an area of pristine vegetation that is left standing while red hot 2000 degree lava flows around it. A cultural kipuka can also reflect connecting non-Native populations to indigenous wisdom. This thesis, Hawaiian Architecture: Developing Responsible Stewards of Our Land looked at creating the Native Hawaiian undergraduate architecture concentration that emerges from the kipuka within the current doctorate architecture program. Surrounded by architecture in the western world, from the pre-historic megaliths to modernist skyscrapers, traditional Hawaiian architecture typology evolved in the Colonization Phase (0-600 A.D.) bringing about the most significant monumental temple structures. Thus, this kipuka in the Hawaiian landscape continues to exist today.

7.7.2 Summary

The current conditions or state of traditional building practices and its cultural knowledge provided the school of architecture to participate from time to time in designing for Native Hawaiian community's utilitarian buildings and residential houses. This thesis, Hawaiian Architecture: Developing Responsible Stewards of Our Land is a program that fosters Hawaiian culture, traditional architecture typology, and ways of learning into an existing academic progranm. It explored and identified successful elements for an undergraduate architecture curriculum in the context of creating the Hawaiian undergraduate architecture concentration. The program defined a strategy that transforms cultural values, place, and community into resources

for learning. Namely, Hawaiian Architecture: Developing Responsible Stewards of Our land

incorporated traditional cultural practices that reflect a close relationship to the ʻāina [land],

ʻohana [family], and kaiāulu [community]. The practice of a traditional Hawaiian educational

system persevered and survived to find its place in the academic world.

A review of the successful elements of traditional cultural practices has been used to

promote cultural integration within the current curriculum. These practices reflected a close

relationship to the ʻāina [land] and the many manifestations of the gods. Plants, animals, rain,

and even the pohaku [rocks] were believed to have mana [spiritual power]. Hawaiians

remembered and honored their ancestral deities and spirits and today, are recognized throughout

Hawaiʻi.

The ahupuaʻa is the traditional Hawaiian land unit that usually extended from the

mountain to the ocean. It was an important principle in old Hawaiʻi, where food and other

supplies were shared between the people from the uplands and the sea to insure that no one went

without food. The land also brought groups together to engage in supportive activities and work

together, as well as connecting them with the internal and external landscapes, developing a sense

of place, and identity.

Within the ahupuaʻa, Native Hawaiians designed an extensive and innovative system of

irrigation to grow kalo [taro]. They designed and built ʻauwai [ditches] to bring water from the

streams into their loʻi kalo [taro terraces] and constructed small rock and earthen dams to regulate

the flow. One of the most important natural elements is fresh water which was viewed as sacred.

This unit of Hawaiian cultural resource management insured that the water was distributed fairly

and used wisely in the ahupuaʻa.[114]

The Hawaiian people also designed, engineered, and developed the loko iʻa [fish pond] to

cultivate fish. These structures was built to provide a steady supply of fish for the Aliʻi [chiefs].

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[114] Project Aloha ʻĀina. (Pacific American Foundation. Honolulu, HI: 2007), 1-4.

The people labored by passing the stones from hand to hand to construct the walls of the fishponds. They also designed and constructed canals to create the currents that would circulate the water in the fishponds. The design of the mākāhā [gates] was an architecture-engineering achievement that allowed smaller fishes to enter the ponds and when grown were not able to escape.

The heiau or temple structures were constructed for religious protocols and to insure a chief's victory over his enemies. These monumental structures were designed by the kuhikuhipuʻuone, an architect who drew the design of the temple in the sand for the chief, committed to memory, and constructed by the people. Within these stone structures of the heiau, several hale [houses] were spatially organized. This was one of the most important elements of traditional practices and construction methods that are still practiced today by cultural practitioners.

Designed and built without nails or metal materials, the hale [house] was constructed to provide shelter from the elements, storage for crafts and clothing, and sleeping quarters. The hale was built from select trees in the forest along with natural fibers. The framing and fastening was joined by lashing or notched and was held together with a human bone. This element reconnects students to successfully transfer traditional knowledge with new gained knowledge by highlighting how the new information fits.

The kauhale [group of houses] comprised of several Hawaiian houses within a compound or settlement for specific functions. Each house was designed and constructed in a spatial order according to the topography, availability of water, natural elements and uses. A chiefly compound had clusters of several structures especially a conference house and an apparel storage house. These structures like the hale were built with natural fibers, lashing methods, and wood notching.

As skilled teachers and skilled masters of their crafts, the kūpuna was suited for the role of mentoring children who were taught to observe, listen, and practice. These principles were also applied to young adults who were in training to become a kahuna [priest], an expert healer, canoe builder, or hale builder. Young chiefs were taught these skills but also politics, military strategy, and religion. Under the Hawaiian system of learning, the rote method or repetition may have been used when teaching certain chants, oratory or prayers. Other learning senses such as memorization skills, careful observations, and practice were essential elements. These methods can also be applied to architecture students as they learn new computer software programs to improve their design and presentation concepts. Repetition, observation, listening, and practicing are techniques that help students enhance mastering their skills and crafts which they rely on when applying for employment, engaging in community meetings, and working with a client.

7.7.3 Strengths and Limitations of This Thesis

This researcher will now highlight the strengths and limitations of this thesis. Hawaiian Architecture: Developing Responsible Stewards of Our Land emerged from this researcher's own experiences in an architecture program and in the professional field. Working with the Native Hawaiian community, the limitations included the need for review by qualified experts in the educational field and Hawaiian studies, as well as the need to implement the program in the current architecture curriculum.

By implementing the previously listed elements, this researcher personally transferred new knowledge from the school of architecture into her community. As an architecture student, this researcher has had the experience of applying western learning methodologies into cultural settings with Native Hawaiian populations of all ages. For example, designing and constructing a traditional hale required many talk sessions and meetings to determine the project site and analysis, size of the hale, availability of natural materials, cordage for lashing, timeline and the

number of persons assigned to work on the project. Together with architecture, planning methodologies and traditional knowledge, this researcher believes that transference of new knowledge to communities has been successful. The result, in this researcher's opinion, requires patience and learning the activity with the people who are living reality.

This research relied upon literature review, data collection, and interviews as its primary research methodologies. This author acknowledges that this thesis lacked grounding in sample size, adequate data for analysis, and self-reported data. The sample size in this study was too small and it was difficult to find significant relationships from the data, as statistical survey usually requires a large sample size to ensure a true representative of the population. Next, the lack of reliable data limited the scope of the analysis. The computer generated architecture student survey questions and collected informational data limited a significant and meaningful relationship between the students and the research because of the low number of respondents. In addition, the self-reported data was gathered by this author during the interview process. To remedy these limitations, this author encourages additional data survey of on-going who graduated from the program. This review process would help insure the accuracy, breadth, and applicability of the concepts contained in this thesis.

In addition, this thesis should be tested in the current program so that observations are made as to how students learn from this cultural paradigm within the current architecture program. If these knowledge gained was were then used to modify the Hawaiian Architecture: Developing Responsible Stewards of Our Land and its application, then the result would be a culturally relevant indigenous learning model that is supported with applied research methodologies as well as professional review.

Finally, the developed coursework is shared within an existing architecture program. This limits the time frame for implementing all the sources and elements. As an undergraduate student

declares architecture as their major, these integrated courses are not stand alone courses until the student reaches the third or fourth year.

7.7.5 Recommendations for Future Research

The constructs of this thesis is based on literary research, data collection, interviews, and this author's educational and personal experiences working with Native Hawaiian population. However, this thesis should be tested in real-life setting, planned, and implemented to observe the effectiveness of the curriculum and any associated problems. Another suggestion would be to apply the sources outside of the classroom environment and in various settings, i.e. loʻi terraces, hale building, and heiau sites. It may be revealed that the curriculum functions more effectively in certain environments. The research could also be taught by an indigenous teacher whose knowledge, cultural background, and experiences of the social, emotional, mental, and physical needs of the students are recognized.

7.7.6 Closing Remarks

Hawaiian architecture, cultural values, and traditional ways of learning honors traditional indigenous learning practices and values can serve as a beneficial learning tool for all architecture students. This study seeks to raise the consciousness of the importance of indigenous education based on Native Hawaiian building principles in architecture. The institution's kuleana [responsibility] is to provide a safe place where walls are no longer barriers between the outdoor and indoor, where the ʻāina and ahupuaʻa is honored during each design project, and where families, kūpuna, and community leaders are honored. By creating new traditions based on the wisdom and knowledge of those who have gone before, these perspectives can serve as beneficial sources for educators and indigenous learners.

This researcher's argument that Native Hawaiian students' learning process is unique because their identity is inseparable from their history, land, family, community, and sense of

place. This researcher believes that by implementing the results from this thesis, the Native Hawaiian undergraduate architecture curriculum is designed to incorporate important cultural components and perspectives. The field of Hawaiian Architecture education has not been explored as a learning paradigm. However, this curriculum can be adapted and expanded to reflect the elements of Hawaiian traditional cultural practices in architecture. This concept is dynamic, exciting, and teachers, facilitators, and students are encouraged to modify and expand upon this research. In addition, a critical analysis of, as well as future research with this concept encourages testing for effectiveness and appropriateness. It is the hope of this researcher that this thesis and the results of the Hawaiian Architecture: Developing Responsible Stewards of Our Land will be a welcomed contribution to the field of architecture and Native Hawaiian education.

'A'ohe pau ka 'ike i ka hālau ho'okāhi.[115]
"All knowledge is not taught in the same school."
(One can learn from many sources)

This 'ōlelo no'eau speaks of our kūpuna who knew the true value of comprehensive knowledge and they also understood the vast array of places in which knowledge and wisdom could be found. Thus, all learners, explore the diversity of Na Kānaka Maoli cultural identity and worldview within a Euro-American society; acknowledge the basic cultural values, beliefs, and traditions of the Kānaka Maoli, and ask the critical question to the Kānaka Maoli about their worldview and learn the depth and breadth of Hawaii's indigenous people.

Ho'omākaukau.

Let us begin!

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[115] Mary Kawena Pukui. *'Ōlelo No'eau: Hawaiian Proverbs & Poetical Sayings.* Bernice Bishop Museum Special Publication No. 71. (Bishop Museum Press. Honolulu, HI: 1983), 24.

Appendix 1
Resources

Prior to European contact in 1778, ancient Hawaii's history depended on observation, memory skills, and education by descendants of Hawaiian chiefs and attendants. During this time, native Hawaiians developed a highly social, political, and economic.[116] The arrival of the missionaries in 1820 shifted the island chiefdoms to an island kingdom. The missionaries taught at Lahainaluna Seminary where many Hawaiian chiefs chose special attendants to receive a formal education in reading and writing. Several assistants who attended this school comprehended the impact of foreign arrivals and excelled in actual publications of their work. Notable among these are David Malo and Samuel Kamakau. Other essential native writers were important sources on religion, ritual practices, or genealogists to mention a few. Although each type of sources utilized has limitations, it is anticipated that using a combination of them will provide an accurate interpretation on that is essential to this work.

The earliest history, *Hawaiian Antiquities* by David [Davida] Malo (1793-1853) has been the primary source of information on pre-and post-contact Hawaiian history. Originally published in 1836, Malo was one of the most important writers and an eye and ear witness in the time of Kamehameha I. Trained by the chief ʻAuwae, an orator and genealogist, Malo developed exceptional skills of observation, memory, and reasoning that he was recommended as a confidant and advisor to the high chiefs. His contributions on Hawaiian traditions, culture, and education place an important value for Native Hawaiians today.

Along with Malo, K. [Kēlou] Kamakau (1773) source on the traditional ritual system and his work is equally important as Malo's transcripts. Kēlou, a lesser aliʻi chief of Kaʻawaloa in Kona lived close to the Hikiau heiau, the most important luakini temple of the district. Kēlou Kamakau taught himself to read and write in 1823. He served as an informant to Reverend

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[116] Manette K.P. Benham and Ronald H. Heck. *Culture and Educational Policy in Hawaiʻi: Silencing of Native Voices.* (Lawrence Erlbaum Associates, Publishers. Mahawah, NJ: 1998), 36.

William Ellis and he (Ellis) found Kēlou Kamakau much "more intelligent and enterprising than the other people around him" and witnessed his intelligence and shared knowledge in detail.[117]

Although Hawaiian historian, Samuel Manaiakalani Kamakau (1815-1876) was not an eyewitness of Kamehameha I's time, he was able to retrieve traditions still fresh in the memory of the kūpuna and especially his grandfather, Kuikealaikauaokalani. Kamakau authored several books including *Ka Poʻe Kahiko: The People of Old, The Works of the People* of *Old: Nā Hana a ka Poʻe Kahiko*, and *Tales and Traditions of the People of Old: Nā Moʻolelo aka Poʻe Kahiko*. *Tales and Traditions of the People of Old:* Kamakau also wrote articles in the Hawaiian language newspaper, Ke Au ʻOkoʻa and Ka Nūpepa Kūʻokoʻa from 1866 to 1871.[118]

Because of his time in the court of Kamehameha II and Kamehameha III, John Papa ʻĪʻī (1800-1870) provided details of his daily life at the courts of Kamehameha in his book *Fragments of Hawaiian History* and published his articles in the Hawaiian newspaper Ka Nūpepa Kūʻokoʻa from 1866 to 1870.[119] In addition, important writers like Kepelino whose name was Kahoaliikumaieiwakamoku, composed his *Moʻolelo Hawaii* in 1868. Although Kepelino did not attend Lahainaluna Seminary, he wrote on the traditions of priests and chiefs and published a series called *Hoʻoiliʻili Hawaii, "Hawaiian Collection*" that served as an important source on religion.

Besides written histories, many Hawaiians since Malo, Kamakau, and Kepelino continued to practice with the kūpuna who memorized unforgettable and sacred chants and hula. As such, the fishing and agriculture customs were preserved in many communities. Through their life long stories, these kūpuna contributed to the many research projects sponsored by the Bishop

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[117] Valerio Valeri. *Kingship and Sacrifice: Ritual and Society in Ancient Hawaii.* Translated by Paula Wissing. (The University of Chicago Press. Chicago, IL: 1985), xxvi-ii.
[118] Samuel M. Kamakau. *Ka Poʻe Kahiko: The People of Old.* Translated from the Newspaper Ke Au ʻokoʻa by Mary Kawena Pukui and arranged and edited by Dorothy B. Barrère. Bernice P. Bishop Museum Special Publication 51. (Bishop Museum Press, Honolulu, HI: 1991), vii.
[119] John Papa ʻĪʻī. *Fragments of Hawaiian History.* (Bishop Museum Press, Honolulu, HI: 1995), ix-xii.

Museum. One of the most important native writers of the twentieth century was Mary Ka-wena-ʻula o ka Lani a Hiʻiaka i-ka-poli-i-Pele na-lei-lehua a Pele Pukui (1895-1986). Author of *The Polynesian Family System in Ka'ū,* Kawena was born in the rugged plains of Kaʻu on the island of Hawaiʻi where she was raised in two cultures. Her mother's line was kahunas and her father's background were the ways of a New Englander. Hanai or raised by her maternal grandparents, Kawena was reared to become the family senior which involved memorizing old chants, rituals, and customs, and learning the meanings and purposes of them. While at home, Kawena spoke with her parents and grandparents in Hawaiian but in Honolulu she spoke only English. By 1935, many of her articles were written by working with her older relatives and neighboring districts to record many phases of the local heritage, traditions, and culture of her ʻohana from Puna, Kaʻu, Hilo, Kona and Honolulu.[120] She would later translate and publish with Dr. Samuel E. Elbert, the *Hawaiian-English, and English-Hawaiian Dictionaries.* The response from readers and scholars not only from Hawaiʻi, but from all parts of the world are grateful for this hardcover book. Hula masters, students, and Hawaiian communities have called the dictionary their bible because of the many citations from chants to songs, and ancient prayers.

The book, *Nānā I Ke Kumu* (Look to the Source) was dedicated to the families and children of Hawaiʻi. It is a source book of Hawaiian cultural practices, concepts, and beliefs that illustrated the wisdom and dignity in the cultural roots of every Hawaiian child.[121] Written in *Nānā I ke Kumu* is the application of Hawaiian methods of healing psychologically, physically, and spiritually. For instance, hoʻoponopono [to make things right] was a method used to restore a misunderstanding in the family and maintain healthy family relationships. This intervention helped physicians and nurses understand how to assist Hawaiian family's well-being and development. Kawena was breaking new grounds in sharing cultural and traditional secrets of

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[120] Mary Kawena Pukui. *The Polynesian Family System in Ka'ū.* (Mutual Publishing, Honolulu, HI: 1998), ix.
[121] Mary Kawena Pukui. *Nānā I Ke Kumu* ("Look to the Source"). (Hui Hānai: An Auxiliary of the Queen Liliʻuokalani Children's Center. Honolulu, HI: 1972), vii.

ancient Hawaii that would later receive much applause and acceptance with resurgence of the Hawaiian renaissance in the 1970's.

In addition, a combination of culture and archaeology appear in several texts and papers researched for this thesis. In analyzing Hawaiian architecture from the perspective of ancient Hawaiian science, Rubellite Kawena Johnson, professor of Polynesian linguistics and co-author, Armondo M. Da Silva wrote on identifying native astronomical registers at various archaeological sites.[122] They explored the site, Ahu a 'Umi Heiau, a Native Hawaiian astronomical and directional register on the island of Hawai'i. In her book, "The Kumulipo Mind: A Global Heritage in the Polynesian Creation Myth," Johnson describes how kahuna priests ordered the sky, space, and time to align the heiau temple with certain sky phenomenon such as the sun's position, rising and setting, and the tracks of stars at night. Author Patrick V. Kirch's book, "Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory" is a starting point as an overview for understanding Hawaiian archaeology and Hawaiian settlement.[123] "Kingship and Sacrifice—Ritual and Society in Ancient Hawai'i" by Valeri Valerio summarizes the ethnographic concerns of religious practices and a comprehensive overview of analyzing Hawaiian rituals.

David Malo's, "Hawaiian Antiquities: Mo'olelo Hawai'i" offer the reader a detail description of the Hawaiian hale. Russ Apple's, "The Hawaiian Thatched House: Use-Construction Adaptation" fulfill the tectonics of the hale, a traditional Hawaiian house that once stood on the heiau platform in Honaunau on the island of Hawai'i.

During ancient times, the kūpuna passed down in the oral traditions contributed chants, cherished songs, hula, and mo'olelo. Information by skilled craftsmen who taught fishing,

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[122] Rubellite K. Johnson and Armondo M. Da Silva. "Ahu a 'Umi Heiau: A Native Hawaiian Astronomical and Directional Register." Ethno astronomy and Archastronomy in the American Tropics. Editors: Anthony F. Aveni and Gary Urton. *Annals of the New York Academy of Sciences.* Vol. 385. (New York, NY: 1982), 313.
[123] Margaret L. Berman. "Towards a Cultural Architecture: Inquiries into Hawaiian Architecture Prior to 1778." MA thesis. (University of Washington, WA: 1994), 16.

agriculture, arts and crafts, tapa making, laʻau lapaʻau [medical plants], navigation, astronomy, heiau and house building were well-preserved.   As mentioned before, the Bernice Pauahi Bishop Museum have made available access to valuable cultural artifacts, oral interviews, published journals, and models of ancient Hawaiian architecture that have helped Hawaiians remain connected with their own traditional culture.

Appendix II

The Hawaiian Islands

The Hawaiian Islands consist of many islands, reefs, and shoals strung out in the Pacific Ocean for 1600 miles and are the most isolated group of islands in the world. Located in the tropics, between the Tropic of Cancer and the Tropic of Capricorn between 18˚ and 28˚ north, latitude, they share with Hong Kong and Mexico City. Seven islands share the same volcanic origin; and one of the seven, Hawai'i Island is still being formed by its volcanoes. Stretching across the floor of the North Pacific Ocean for 2,000 miles, these eight major islands make up ninety percent of the land area and among the Pacific islands.

The geological formation of the islands results from many conditions such as a combination of age; soil, reefs, and rainfall have shaped the islands. For instance, Kauai was formed from a single major volcanic dome.   Mt. Waialeale [Rippling Water] , the wettest spot is the highest peak of 5,148 feet and receives more than 300" of rain annually with 624 inches falling in the rainiest year. Because of this extensive moisture, there are coastal plains and valleys with larger streams and deeper soil deposits than on the other island. The windward-leeward rainfall is a dominant factor in developing local land forms as well as vegetation patterns.

 Hawai'i Island is the largest and youngest island in the chain. It was formed by five volcanic domes---Kohala, Mauna Kea, Mauna Loa, Kilauea, and Hualalai. Kohala erupted long before the others and is much older. These mountains are smooth rather than rugged. There many waterfalls inland that continues eroding the steep cliffs. The two highest mountains on Hawai'i are Mauna Kea (13,784 feet) and Mauna Loa (13, 680 feet) and during the winter months, both are covered with snow.[124]

The seasonal patterns generally consisted of the winter months from October to April that are the wettest and summers considered drier from May to September. To the ancient Hawaiians,

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[124] Norris W. Potter, Lawrence M. Kason, and Dorothy Hazama. *Hawaii: Our Island State.* (The Bess Press. Honolulu, HI: 1979), 19-31.

especially those in the leeward areas, seasonal rainfall was important for the scheduling of agricultural activities. The valley and cliff complexes offered the most favorable locale for constructing taro pond fields irrigation systems while others were favored extensive dry field cultivations. These Hawaiian environments satisfied the climatic and soil requirements for successful cultivation. Dependent on the amount of rainfall and sun available at different elevations, there are zones in which agriculture, fishing, and forest products fall into the basic unit of land division from the mountain to the ocean in ancient Hawai'i, known as the ahupua'a:

- The forest zone at altitudes of 2,000 feet to 2,500 feet received 80" to 100" of rainfall; this area produced trees for canoes, houses, bird feathers, kappa, olona, and ti-leaf.

- The agricultural zone at altitudes between 1,000 feet and 2,000 feet received 25" to 60" of rainfall; this area is the intermittent occupancy of houses, taro fields, sugar cane, breadfruit, sweet potato, etc.

- The sea level below 1,000 feet received less than 25" of rain annually; this living area provided medicinal plants, coconut groves, shellfish, seaweed, fishes, etc. [125] (see figure 4).

This island chain's climate is best described as subtropical and is influenced by the latitude of the islands, their altitude, the northeast trade winds, and passing low pressure areas that pass to the north.

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[125] Patrick V. Kirch. "Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory." (University of Hawai'i Press. Honolulu, HI: 1985), 4.

Doctorate Architecture Chart 1

University of Hawaii Manoa, School of Architecture

D. ARCH. PROGRAM CHART - Academic Year 2011 - 2012

Student Services / student's initial (m/d/y) _____

Student Name _____

ID# _____   sem/year entered _____

Page 1 of 3

YR	SEM	ARCHITECTURE PROGRAM COURSEWORK				UNIVERSITY COURSEWORK			CR
		DESIGN	TECHNOLOGY	HIST/THEORY				
1	F	ARCH 101 [4] Basic Arch Studio	ARCH 100 [3] Intro to the Built Environment		ART 1XX [3] Freehand Emphasis	ENG 100 [3] Composition I	HIST 151 [3] World History		18
	S	ARCH 132 [4] Design Communication			ELECT XXX [3] Hawaiian Focus	MATH 140 [3] Pre-Calculus	HIST 152 [3] World History	ELECT 3XX4XX [3] Oral Core	18
		PRE-REQ ARCH 100; 101							
2	F	ARCH 201 [4] Arch Studio [ARCH 235 - Fall 2011]		ARCH 200 [3] Prof Practice of Arch	ARCH 271 [3] World Arch and Urbanism A		PHYS 151+L [4] College Physics		LANG 101 [4] Language Elective	18
		PRE-REQ ARCH 132; ART 1XX		ARCH 100	HIST 151				
	S	ARCH 235 [4] Computer App in Arch [ARCH 201 - Spring 2012]	ARCH 320 [3] Intro to Arch Systems A	ARCH 272 [3] World Arch and Urbanism B			ELECT 1xx/2xx [3] Concentration	LANG 102 [4] Language Elective	17
		PRE-REQ ARCH 132; 200, 201	MATH 140	HIST 151, 152				

Declare Architecture Studies Concentration no later than beginning of Fall of Third Year.

Concentration

YR	SEM	DESIGN	TECHNOLOGY	HIST/THEORY					CR
3	F	ARCH 341 [4] Intermediate Arch Studio A	ARCH 433 [3] Prof Practice, Law & Ethics	ARCH 321 [3] Intro to Arch Systems B	ARCH 371 [3] Design Theory			LANG 201 [3] Language Elective	16
		PRE-REQ ARCH 235, 272, 320	ARCH 200	ARCH 320, PHYS 151 + L	ARCH 271, 272				
	S	ARCH 342 [4] Intermediate Arch Studio B		ARCH 322 [3] Sustainable Systems	ARCH 3xx4xx [3] Concentration	BIO SCI [3] BIO Sci Core		LANG 202 [4] Language Elective	16
		PRE-REQ ARCH 341		ARCH 321					

ALL coursework for years 1 through 3 must be completed at the time of portfolio submittal.

Required Portfolio Review   1   2   3

YR	SEM	DESIGN	TECHNOLOGY	HIST/THEORY					CR
4	F	ARCH 415 [6] Concentration Arch Studio	ARCH 3xx4xx [3] Concentration	ARCH 3xx4xx [3] Concentration	ARCH 4xx [3] Concentration	ELECT 3xx4xx [3] Concentration	ELECT 3xx4xx [3] Concentration		12
		PRE-REQ ARC 11,342, 322, 371							
	R					ELECT 3xx4xx [3] Social Science Core	ELECT 3xx4xx [3] Concentration		15

credit total, years 1-4   126

All UH Manoa General Education Requirements must be accomplished by end of year 4; See specific requirements in UHM Catalog.
Foundation Requirements: 12 credits, to be completed in the first year at UHM (or prior to completing 25 credits)
Written Communication [FW]: 3 credits Symbolic Reasoning [FS]: 3 credits Global and Multicultural Perspectives [FG]: 2 courses, 6 credits
Focus Requirements:
Hawaiian, Asian, and Pacific Issues [H], Contemporary Ethical Issues [E], Oral Communication [O]: One course each
Writing Intensive [W]: five courses (at least two "W" courses must be numbered at the 300- or 400- level)
Diversification Requirements: 19 credits
DA-Arts, DH-Humanities, DL-Literatures: 6 credits   DB-Biological Science, DP-Physical Science, DY-Laboratory (science); 7 credits   DS-Social Science: 6 credits

Doctorate Architecture Chart 2

University of Hawaii Manoa, School of Architecture
D. ARCH. PROGRAM CHART - Academic Year 2011- 2012

Student Services / student's initial (m/d/y)

Student Name _____

ID# _____

YR	SEM	DESIGN		TECHNOLOGY		HIST/THEORY	ELECTIVES		CR
5	F	ARCH 541 [6] Architecture Studio II	ARCH 533 [3] Adv Design Communication II	ARCH 521 [3] Arch Systems II: Wood & Steel		ARCH 515 [3] Asia-Pacific Arch History & Theory	ELEC 5xx6xx[3] Open Elective University Wide		
		PRE-REQ Graduate Status	Graduate Status	Graduate Status		Graduate Status	Graduate Status		18
	S	ARCH 542 [6] Architecture Studio III		ARCH 524 [3] Arch Systems III: Conc & Masonry	ARCH 525 [3] Arch Systems IV: Sustainability	ARCH 539 [3] Research Methods Seminar		ARCH 5xx6xx[3] Arch Elective	
		PRE-REQ ARCH 523, 533, 541		ARCH 523		ARCH 515, 541			18
6	F	ARCH 544 [6] Arch Studio V: Comprehensive Comprehensive	ARCH 545 [3] Advanced Practice		ARCH 526 [3] Arch Systems V: Integration	ARCH 516 [3] Arch & Urban Design Theory		ARCH 5xx6xx[3] Arch Elective	
		PRE-REQ ARCH 542, 524	ARCH 524, 533		ARCH 515, 524, 525, 542	ARCH 515			18
	S	ARCH 543 [6] Arch Studio IV: Urban Design	ARCH 546 [6] Doctorate Project I						
		PRE-REQ ARCH 542, 524	ARCH 515, 516, 526, 539, 545						12
7	F	ARCH 547C [12] 547P [12], 547E [12] Professional Studio							
		PRE-REQ ARCH 543, 544, 546							12
	S	ARCH 548 [6] Doctorate Project II		ARCH 551 [1] Architecture Topics 3 courses at 1 credit each OR one 3 credit Arch Elec 5xx6xx				ARCH 5xx6xx[3] Arch Elective	
		PRE-REQ ARCH 547C or 547P or 547E							12

credit total years, 5-7   90
credit total, years 1 thru 7   216

Architecture Program Concentration Coursework Doctorate

University of Hawaii Manoa, School of Architecture

D. ARCH. PROGRAM CHART - Academic Year 2011 - 2012

CONCENTRATION Coursework - 8 total required courses

Select ONE Concentration Area from those listed below

CONSTRUCTION MANAGEMENT Concentration Required Coursework

Required Coursework
   CEE 472 Construction Management (IS Third College)
   ARCH 490 Special Topics: Construction

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education
   Geography, Planning, Sociology, Anthropology, Geology
Two additional Architecture Electives at the 3xx or 4xx level

HISTORIC PRESERVATION Concentration Required Coursework

Required Coursework
   HWST 3xx4xx Any course at this level (IS Third College)
   ARCH 471 Historic Architecture Design Seminar

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education
   Philosophy, American Studies, Planning, Anthropology, Sociology
Two additional Architecture Electives at the 3xx or 4xx level

INTERIOR DESIGN Concentration Required Coursework

Required Coursework
   APDM 3xx4xx Any Course at this level (IS Third College)
   ARCH 461 Introduction to Interior Architecture

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education
   Art (Studio), Art (History), American Studies, Ethnic Studies, Philosophy
Two additional Architecture Electives at the 3xx or 4xx level

LANDSCAPE DESIGN Concentration Required Coursework

Required Coursework
   TPSS 3xx4xx Any course at this level (IS Third College)
   ARCH 350 Introduction to Planning

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education
   Geography, Planning, Anthropology, Sociology, Botany
Two additional Architecture Electives at the 3xx or 4xx level

URBAN DESIGN Concentration Required Coursework

Required Coursework
   NREM 3xx4xx Any course at this level (IS Third College)
   ARCH 350 Introduction to Planning

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education
   Geography, Planning, Anthropology, Sociology, Philosophy
Two additional Architecture Electives at the 3xx or 4xx level

ARCHITECTURE DESIGN Concentration Required Coursework

Required Coursework
   CEE 472 Construction Management (IS Third College)
   ARCH 490 Special Topics: LEED

Four 3xx/4xx courses in the Colleges of Arts and Sciences in at least two of these departments, one must satisfy the DS Core requirement of General Education
   Geography, Planning, Anthropology, Sociology, Art (Studio)
Two additional Architecture Electives at the 3xx or 4xx level

Appendix VI

Interview Materials (B)

Human Subjects Consent Form

Consent to Participate in Research

Title of Study: Hawaiian Architecture: Developing Responsible Stewards of Our Land

Purpose of the Study:

The purpose of the study is to gain a better understanding merging Native Hawaiian culture, cultural values, traditional knowledge, and ways of knowing, and oral traditions from a Hawaiian perspective with the current School of Architecture program at the University of Hawaiʻi at Mānoa.

This study hopes to yield information that will help improve the higher educational experiences of Native Hawaiians and other underrepresented students. This research project is also being conducted in partial fulfillment of a doctoral degree from the School of Architecture at the University of Hawaiʻi at Mānoa.

Your Participation:

Your name was selected from a public list of names identifying you as a graduate/current major at the School of Architecture. As a graduate/current major of the School of Architecture, I would like to invite you to participate in this study. Your participation would consist of one-time in-person interview that will involve questions and sharing "talking story." This interview would last approximately 60 minutes and will be audio taped.

Issues of Confidentiality:

You will be offered the option to remain anonymous or be identified in the written presentation of the study. In either case, the information you share with me, as an individual will remain in confidence. Every effort will be made to keep your personal information confidential.

As previously mentioned, our conversation will be audio taped. The tapes will be used for research purposes only. Specifically, the audio tape(s) will be used for building themes for the research project as well as maintaining accuracy in the written presentation. Your identity will not be disclosed. Furthermore, you have the right to review the audio tape(s) made as part of the study to determine whether they should be edited or erased in whole or in part.

Risks/Benefits of Your Participation:

Because you will be asked questions about personal aspects of your life, you may feel embarrassed or uncomfortable while answering them. Also, because it may take up to

approximately 60 minutes for you to answer all the questions, you may become tired. You may stop answering questions and take a break at any time.

You should not expect to benefit directly from this research. However, your participation would be helpful as the information you provide may assist in improving higher education environments for Native Hawaiians and other underrepresented students. Moreover, this would be an opportunity for you to share your experiences, opinions, ideas, and perspectives as an alumnus/student of the University of Hawaiʻi at Mānoa.

Your Rights:

You may withdraw your consent at any time or discontinue your participation without penalty. By signing this consent form you are not waiving any legal claims or rights because of your participation in this research study. If you have any questions regarding your rights as a research subject, you may contact the: IRB University of Hawaiʻi Committee on Human Studies, 1960 East-West Road, Room B-104, Honolulu, HI 96822; telephone: (808) 956-50087; email: uhirb@hawaii.edu.

Contact Information:

For questions regarding the study, to request a copy of the full research proposal, or for further clarification of this consent form, please feel free to contact the principal investigator, Francine M.P. Palama, at (808) 341-9881 or via email: palama@hawaii.edu. You will get a copy of this form.

My signature indicates that I understand the "Consent to Participate in Research" form and agree to participate in this study.

_____   _____
Participant Signature   Date

_____
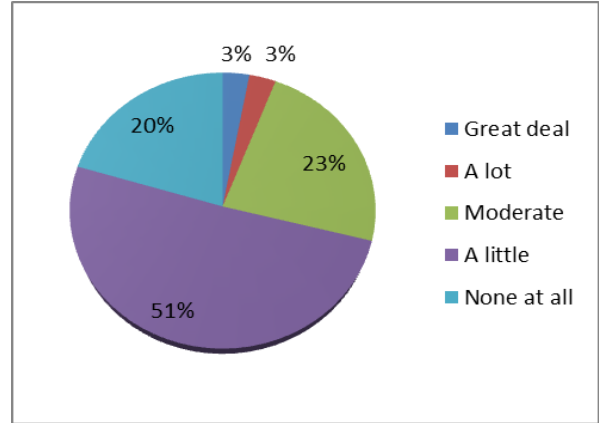Participant Name (Please Print)
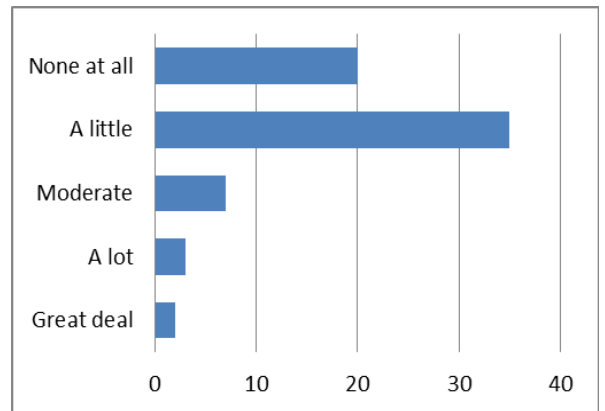
Data Results from All-School Student Survey

1. How often they participate in Hawaiian cultural practices?

A great deal	2
A lot	2
Moderate amount	16
A little	35
None at all	14
Total	**69**

2. How often have you visited a traditional Hawaiian heiau (temple)?

A great deal	2
A lot	3
Moderate amount	8
A little	36
None at all	20
Total	**69**

3. **How often do you use Hawaiian words to describe your studio project?**

A great deal	1
A lot	3
Moderate amount	13
A little	27
None at all	25
Total	**69**

4. **Do your classes at this architecture school describe Hawaiian culture to you?**

A great deal	1
A lot	5
Moderate amount	14
A little	31
None at all	18
Total	**69**

5. Does this school give too much attention to Hawaiian Architecture construction methods and design, too little or about the right amount of attention?

A great deal	1
A lot	2
Moderate amount	21
A little	14
None at all	25
Total	**69**

6. Student classification

Undergraduate	44
Graduate	25
Total	**69**

7. Identifying Native Hawaiian, Part Hawaiian, and non-Hawaiian students.

Native Hawaiian	1
Part-Hawaiian	13
Non-Hawaiian	55
Total	**69**

8. Students' opinion on likely to learn about Hawaiian Architecture.

Extremely	14
Very regularly	18
Moderate	19
Slightly	15
None at all	5
Total	**69**

9. Students' views on the usefulness of Hawaiian practices and methods in architecture

Extremely	12
Very regularly	20
Moderate	19
Slightly	13
None at all	5
Total	**69**

10. Expectations of implementing Hawaiian Architecture

Extremely	8
Very regular	14
Moderate	20
Slightly	17
None at all	10
Total	**69**

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