

## THE EDUCATION OF SUSTAINABLE DEVELOPMENT LABORATORY: LEADERSHIP ENVISIONED THROUGH HAWAIIAN CULTURE VALUES

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### Abstract:

Human evolution is marked by four distinct ages defined by knowledge development. Larger and more diverse populations of people shorten each age through increased access to information and educational opportunities. The present Information Age is heralding in an awakening of the harmful impacts of the preceding Industrial Age. The awakening includes the notion that education is an “engine” to usher in a *Sustainable Development Age*. The United Nations declared the Decade of Education for Sustainable Development (2005-2014) to stimulate new educational approaches towards dealing with escalating global issues caused by social interaction with natural systems. The laboratory schools can play a pivotal role in designing education programs through analyzing knowledge development frameworks that best cultivate a sustainable mind-set. The University Laboratory School (Hawai'i) has a unique opportunity to use the pending campus-wide redevelopment process as a research project for establishing a leading design of education for sustainable development, while building a sustainable campus and community. The students graduating from this educational environment, guided by Hawaiian indigenous wisdom, not only have the potential to become catalysts of sustainability for the University of Hawai'i and their communities; but also the seeds of the *Equality, Peace and Prosperity Age*.

**Keywords:** *education; sustainable development; laboratory schools; knowledge frameworks; human evolution*

## LA EDUCACIÓN DE LABORATORIO DE DESARROLLO SOSTENIBLE: LIDERAZGO CONCEBIDO A TRAVÉS DE LOS VALORES DE LA CULTURA HAWAIANA

### Resumen:

La evolución humana está marcada por cuatro eras definidas por el desarrollo del conocimiento. Poblaciones más grandes y diversas acortan cada era con un mayor acceso a la educación y las oportunidades educativas. La actual Era de la Información anuncia un despertar de los efectos nocivos de la previa Era Industrial. El despertar incluye la noción de que la educación es un “motor” hacia la *Era del Desarrollo Sostenible*. Las Naciones Unidas declararon la Década de la Educación para el Desarrollo sostenible (2005-2014) para estimular nuevos enfoques educativos para afrontar la escalada de problemas globales causados por la interacción social con los sistemas naturales. Los colegios laboratorio pueden jugar un papel crucial para diseñar programas educativos analizando los marcos de desarrollo del conocimiento que mejor cultivan una mentalidad sostenible. El Colegio Laboratorio de la Universidad (Hawái) tiene una oportunidad única para usar el proceso pendiente de rediseño del campus como proyecto de investigación para establecer un diseño líder de educación para el desarrollo sostenible, y construir un campus y una comunidad sostenibles. Los graduados de este entorno educativo, guiado por la sabiduría indígena hawaiana, no sólo tienen el potencial de convertirse en catalizadores de la sostenibilidad en la Universidad de Hawái y sus comunidades, sino también en semillas de la *Era de la Igualdad, la Paz y la Prosperidad*.

**Palabras clave:** *educación; desarrollo sostenible; colegios laboratorio; marcos de conocimiento; evolución humana*

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## 1. Introduction

Three distinct periods of human evolution have altered the capacity of humans to develop and experience the world in which they live. First, the longest period of human existence was transcended when the hunter-gatherer nomadic tribes learned to settle in one location by propagating local food sources through the domestication of plants and animals (Agricultural Age). Secondly, through scientific discoveries and technological advances, production increased to usher in a more intensive economic growth paradigm (Industrial Age). Thirdly, education became a widespread activity leading to a growing, diverse, highly-educated work force, which stimulated a greater degree of individual and intellectual freedom (Information Age).

At the heart of these shortening evolutionary eras has been an expansion of human's intellectual ability to manipulate materials of the Earth to enhance human development and experience. The common denominator of these evolutionary periods is increasing food production accompanied by expanding human population growth. Estimates of the carrying capacity of the Earth indicate the present population exceeds the resource supply capacity, if every human is to attain the standard of living enjoyed by an average American (Cohen 1995; Czech et al. 2003).

Such a scenario has challenging implications for attaining global equality and democracy, tenants of the overall mission of the United Nations (UN) to achieve the world peace. However, the UN has become a recognized medium for uniting the international community to work together on global issues. An example is *Agenda 21* (1992), a pivotal agreement ratified by 178 nations, which charts a path to a new paradigm labeled "sustainable development".

When there was less than anticipated evidence of a shift from the existing economic-driven paradigm towards a sustainable paradigm after 12 years of *Agenda 21*'s implementation, the international community agreed to increase focus on the educational component (UNSDS 2015b). The UN declared 2005 to 2014 as the *Decade of Education for Sustainable Development*. This is in recognition of the capacity of human intellect in manifesting new strategies when threats to survival appear. The discoveries of cures for diseases reaching epidemic levels are examples of human intellect enhancing human survival.

The *Decade* is an international response to heighten the level of global intellectual capacity to find strategies to deal with burgeoning issues related to population expansion and resource exploitation. Fortunately technological advances, associated with the Information Age, in communication and data analyses have increased the participatory level within the global community. Internet access to the exponential growing multi-perspective data accumulation makes all learning institutions and their community potential breeding grounds for creating local solutions to global issues by consciously designing, implementing, and performing daily sustainable practices. In addition to this intellectual focus, we point out there is a possibility that the knowledge development framework used by the institutions may influence the values adopted or mindset produced.

The University Laboratory School (ULS), Hawai'i is a convenient institution to assess the knowledge development practices being implemented and how they are affecting the level of sustainable action. The ULS is a pre-kindergarten to 12<sup>th</sup> grade educational research facility operating under the *Curriculum & Research Development Group* of the College of Education affiliated with the University of Hawai'i, Mānoa (UHM). If the ULS displays as an exemplary sustainability educational model, it can be thus flagged to increase its influence on education programs nationally and internationally. Secondly, the ULS is in the planning stages to upgrade its aging facilities and renovate the campus. This presents an opportunity to apply sustainable development practices in the process of researching, designing and constructing a model sustainable campus. Thirdly, the ULS is associated and shares facilities with the UHM, a community displaying a rising level of activity related to sustainability initiatives.

Since the world is facing unprecedented environmental and resource depletion issues as the economic gap between the wealthy and poor widens, educational institutions have the potential to become an important catalyst for addressing these issues and ushering in a new Age. There is an increasing urgency to shift from the conflict-provoking *modus operandi* to a sustainable development paradigm in an environment of military activities and global financial uncertainty (Worldwatch Institute 2012). Therefore the ULS is an institute that can respond to the international community (represented by United Nations delegates) consensus by becoming an educational "engine" ("education energy", Fritzler 2014) towards achieving a sustainable development paradigm.

## 2. The call for a new educational paradigm

### 2.1. Education and world development

Education appears to be a catalyst for human evolution, and the urgency of adopting a sustainable development paradigm is captured in the 2013 *Intergovernmental Panel on Climate Change* (IPCC) report, where research reconfirms human activity is the primary cause of changes in planetary weather systems, which are affecting the valance of the global ecosystems. The evidence of global climate change is being documented by IPCC research, commissioned by the UN, involving over 800 scientists from 195 countries. They peg a significant contributor for climate alteration as being the use of fossil fuels that are escalating carbon dioxide levels in the atmosphere. At the root of this research is “globalization” of the economic growth model, a trend requiring knowledge development of multidisciplinary, innovative minds to address (Czech et al. 2003).

### 2.2. The international paradigm shift due to World War II

Although World War I was deemed “the war to end all wars” and triggered the formation of the League of Nations, it appears World War II created a major shift in consciousness about the survival of humanity. International collaboration became reality through the transformation of the League of Nations into a global unity movement labeled the United Nations. One of the first international standards, the *Universal Declaration of Human Rights* (1948), triggered a global movement towards manifesting in its art. 26 (United Nations 2010) that “everybody has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit”. Moreover, “education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace”.

With education evolving in the Industrial Age, education became an economic investment for nations to compete in a global economy based on international trade. With the industrialized nations gaining power, they began to dominate in shaping global policy through the Organization for Economic Co-operation and Development (OECD) and the World Bank (spring 1998). Education is seen as a way to cultivate human capital (Sadovnik et al. 2001) towards a world of endless opportunities, based on economic principles.

### 2.3. The Agenda 21

Through an international consensus that human activity was degrading the environmental conditions of the Earth, the UN reacted by conducting the 1992 Earth Summit in which *Agenda 21* was tabled and ratified by 178 nations.

*Agenda 21* became the blueprint for the concept of sustainable development, stemming from the framework outlined in *Our Common Future*, also known as the *Brundtland Report* (World Commission on Environment and Development 1987). This triggered many organizations, both government and non-government, to use the tenets of sustainable development as a guide in operations and policy development. Many corporations also began to incorporate sustainable practices into their operations while finding new markets for more environmentally friendly products. However, this approach is still operating in the traditional economic-driven paradigm, placing the highest priority on maximizing profit.

To shift to a sustainable development paradigm, there is a growing recognition that a new mindset or consciousness is required. Under the new paradigm, all development decisions are made giving equal consideration to the *economic, social and environmental* values.

*Agenda 21* is divided into four sections: i) social and economic dimensions; ii) conservation and management of resources for development; iii) strengthening the role of major groups; and iv) means of implementation. The document is also targeted to empower the voices of women, youth, and indigenous peoples to bring back balance and new perspectives.

To be precise, art. 24.1 in Section III states that “the international community has endorsed several plans of action and conventions for the full, equal and beneficial integration of women in all development activities [...] Effective implementation of these programmes will depend on the active involvement of

women in economic and political decision-making and will be critical to the successful implementation of *Agenda 21*".

In a similar sense, and according to art. 25.1, "youth comprise nearly 30% of the world's population. The involvement of today's youth in environment and development decision-making and in the implementation of programmes is critical to the long-term success of *Agenda 21*".

And art. 26.1 adds that "indigenous people and their communities have an historical relationship with their lands and are generally descendants of the original inhabitants of such lands. In the context of this chapter the term «lands» is understood to include the environment of the areas which the people concerned traditionally occupy. Indigenous people and their communities represent a significant percentage of the global population. They have developed over many generations a holistic traditional scientific knowledge of their lands, natural resources and environment. Indigenous people and their communities shall enjoy the full measure of human rights and fundamental freedoms without hindrance or discrimination. Their ability to participate fully in sustainable development practices on their lands has tended to be limited as a result of factors of an economic, social and historical nature. In view of the interrelationship between the natural environment and its sustainable development and the cultural, social, economic and physical well-being of indigenous people, national and international efforts to implement environmentally sound and sustainable development should recognize, accommodate, promote and strengthen the role of indigenous people and their communities".

#### 2.4. *The Decade of Education for Sustainable Development*

With little evidence of progress towards a sustainable development paradigm through years of conference and summit venues, the UN formulated the *Millennium Development goals* (2000). At the World Summit on Sustainable Development in Johannesburg, South Africa (2002), the commitment to change was bolstered through the recognition that *education is a motor of change* (UNESCO 2005) by declaring 2005-2014 as the *Decade of Education for Sustainable Development*. This triggered a body of literature on Education for Sustainable Development (ESD).

In a report entitled *Shaping the Education of Tomorrow* (2012) United Nations Educational, Scientific and Cultural Organization (UNESCO) published evidence of progress that has been made in the first eight years of the *Decade* and opened up a gateway to more civil society participation.

The 2012 Earth Summit engaged the global community of non-governmental organizations (NGOs) and is being tagged as the largest conference in the history of the UN where governments "renewed their strong political commitment to sustainable development and to promote integration and coherence of policies and the implementation of actions in the social, economic and environmental areas" (UNSD 2015a).

Ongoing initiatives such as the UN Sustainable Development Knowledge Platform provide a wealth of data on the sustainability movement. On February 12<sup>th</sup>, 2013, a Google Hangout conference described the 2012 Earth Summit as a gathering of over 50,000 representatives from government, media, academia, civil society organizations, and scientists concerned with the economic, social, and environmental crises facing humanity. The biggest political outcome of the conference was an overall consensus that avoiding the pending global crisis will be accomplished by rethinking *development*, signaling that *everyone* in civil society has to be engaged in this rethinking. The first key message is *people are important, but equally important is the Planet of which the prosperity of these people depends*. secondly, *young people are the architects of the future we want*.

#### 2.5. *Call for civil society engagement*

To set new goals to replace the Millennium Development Goals targeted for 2015, the UN reached out to the global society through the initiatives labeled *The World We Want*<sup>1</sup>, and *The Future We Want*<sup>2</sup>. The UN Sustainable Development Knowledge Platform's website<sup>3</sup> solicits

<sup>1</sup> <https://www.worldwewant2015.org/post2015-about/>.

<sup>2</sup> <https://www.sustainabledevelopment.un.org/futurewewant.html/>.

<sup>3</sup> <https://www.sustainabledevelopment.un.org/index.php?page=view&type=9502&menu=1565&nr=5/>.

contributions of ideas towards different categories which are tied to the formulation of the Sustainable Development Goals, follow up to the Millennium development Goals that end 2015.

In a similar sense, the UN Major Group for Children and Youth website<sup>4</sup> was open to individuals and groups consisting of children and youth under 30 years of age to submit their input on world issues. The World Children Want<sup>5</sup> is a separate website catering to girls and boys between 8 and 18 years of age.

There is also the Women's Major Group website on creating a just and sustainable future<sup>6</sup>, dedicated to soliciting input from women.

Meanwhile, and for the indigenous people major group, there is not an equivalent website soliciting input, but only websites that relate different developments in indigenous interactions<sup>7</sup>.

### 2.6. *The participatory research and program development for ESD*

New thought paradigms can be created when children and youth express perspectives based on their less biased judgment, which in turn alter the thinking pattern of adults. Walt Disney, who intimately connected with children and youth, stated that "our greatest natural resource is the mind of our children". Research confirms the genius levels associated with the learning abilities of children (Robinson 2010) and this is recognized as equating them to the "research and development department of humanity" (Gopnik 2011). Unfortunately, with age, our genius level drops (Robinson 2010) and, on maturity, our thought pattern is set with a tendency to resist new perspectives.

Another factor worth considering is how the dominant education system tends to treat children and youth as developing individuals, who require knowledge development before they attain enough credibility to participate in designing their own destiny. This top-down approach of schooling is reversed in the sustainable development agenda, which treats children and youth as equal participants in developing a sustainable development paradigm.

### 3. **The culture of learning and rationality towards sustainability**

According to Robert M. Pirsig in his book "*Zen and the Art of Motorcycle*" (1974), "but to tear down a factory or to revolt against a government [...] because it is a system is to attack effects rather than causes; and as long as the attack is upon effects only, no change is possible. The true system, the real system, is our present construction of systematic thought itself, rationality itself, and if a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a systematic government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves in the succeeding government. There is so much talk about the system. And so little understanding".

Albert Einstein's statement, "we cannot solve problems by using the same kind of thinking we used when we created them" echoes Pirsig's quote. Both intellects suggest that creating any paradigm for reform, such as educational reform, requires a new way of thinking. Kuhn (1962) directs us to question the assumptions behind the theories if problems can no longer be solved under the operating scientific paradigm. Since learning is guided by a knowledge development framework, perhaps different frameworks may influence different outcomes.

The Western culture of learning and rationality is shaped by the framework of an education system that is divided into standardized subject areas resulting in a rigid reductionist approach. There is also a dominating notion that humans are superior in their ability to use and control nature. An associated research project, comparing four frameworks of research methodology, conclude the mainstream knowledge development model used in our schools is not conducive to cultivating a sustainable mindset. To instill sustainable values and practices, the knowledge development framework must be student-oriented to enhance each student's innate learning abilities<sup>8</sup>.

<sup>4</sup> <https://www.uncsdchildrencyouth.org/index.html/>.

<sup>5</sup> <https://www.worldwewant2015.org/children/>.

<sup>6</sup> <https://www.womenmajorgroup.org/>.

<sup>7</sup> Such as, for example, <https://www.tebtebba.org/>.

<sup>8</sup> Please, refer to the article "*The culture of learning and rationality towards sustainability*", by R.D. Peel (in press) for the comparison of research methodology frameworks on knowledge development in relationship with a culture of practicing sustainable measures.

### 3.1. The sustainability movement: the green school movement

Another major factor affecting knowledge development is the learning environment. The trend of society becoming increasingly insensitive to the environment, through living in urban settings, is being countered by increasing the interaction of children and youth with nature. Schools are reconnecting students and nature through field trips. More ambitious efforts are made by designing schools to adopt settings that mimic the natural environment. There appears to be a correlation between the timing and intensity of UN sustainability programs and the beginning of and the number of schools that are adopting green agendas. This has cultivated a *green school movement* (Duncan 2012). Part of the motivation is to reduce energy costs associated with aging schools, but more importantly it is to enhance the overall learning environment.

As an example, the Green School in Bali received an award as “the greenest school on earth” by the US Green Building Council (2012). The Green School’s vision “is of a natural, holistic, student-centered learning environment that empowers and inspires our students to be creative, innovative, green leaders” (Green School 2015), while operating with the lowest carbon footprint possible.

### 3.2. The sustainability movement: laboratory schools as a catalyst toward education for sustainable development

TO add a strong scientific foundation to the green school movement, laboratory schools are contended to be an essential catalyst in developing and employing the most effective sustainability curriculum through their research and participatory functions. Laboratory schools have an extensive history of creating educational reform starting with the Dewey’s Laboratory school established at the University of Chicago. Lab schools have evolved to develop and assess education tools and methodologies geared to improve education and teacher training (Hunter 1970; Provenzoi 1979; IALS 2013). According to the National Association of Laboratory Schools (NALS) publication “*Laboratory Schools: an Educational Resource*” (1991), there were 98 laboratory schools operating in 1964. The publication makes the argument that for the lab schools to survive in an environment of diminishing resources, they have been advised to adopt “concentrations on experimentation, research and development, or other emerging areas of service” (NALS 1991, p. ix). Arthur King Jr., of the Laboratory School in Hawai‘i, is one of the contributing authors who outlines the advantages of laboratory schools being associated with a university, while continuing to have “flexibility, immunity from rule setting boards and bureaucracies, and the encouragement to take unusual risks” (NALS 1991, p. 167).

The NALS transformed into the International Association of Laboratory and University Affiliated Schools (IALS) to include an international membership of “campus-based schools, and others with diverse university affiliations, such as charter schools, professional development schools, child study institutes, research and development schools, etc.” (IALS 2013).

The Hawaiian version of the laboratory schools is the University Laboratory School (ULS) that has evolved from its formation dating back to 1895.

**Figure 1.** Energy consumption and sustainable constructed facilities at the Green School Bali



Source: Green School (2015)

#### 4. The University Laboratory School, Honolulu, Hawai'i: a built reputation of leadership in education reform

The ULS has built an international reputation of K-12 education program development through its research role in curriculum and course development. This reputation is a result of the research methodology proposed by King and Brownell (1966) allowing an unbiased scholarly approach to curriculum development that is normally subjected to political, religious, special interests, and corporate influences. The ULS's affiliation with the University of Hawai'i provided a conduit for all the disciplines to aid in curricula development.

It was estimated that by 2000 over 600 university faculty across all the disciplines had contributed to developing curricula in a variety of the ULS Curriculum Research & Development Group (CRDG) projects. Working relationships with the ULS extend internationally. Over 7000 schools in 44 states participated in using CRDG programs along with establishing partnerships with 16 mainland universities "who serve as centers disseminating and adapting CRDG programs in their service areas" (King 2000).

The conditions that are associated with the success of the ULS are (King 2000):

- "The CRDG has received predictable, long-term support.
- The CRDG has benefited from its allocation of permanent university positions, enabling it to build a core staff of career professionals.
- The CRDG's endeavors benefit from its affiliation with the university.
- The CRDG's work is grounded in a sound and internationally consistent theory for guiding curriculum development.
- The CRDG began small, developing curriculum for the state's schools.
- The CRDG has allowed ample time for development, trials, and revisions.
- The CRDG has found its dedicated laboratory school vital to its mission.
- The CRDG has been able to learn from the mistakes of other curriculum pioneers.
- The CRDG has a number of independent projects.
- The CRDG has the capacity to adapt to changing standards and conditions, adding new tasks and adapting existing ones to achieve its goals".

Missing from King's (2000) assessment of success is the link to the community, which he attributed as a key element in his 1967 article describing the new multifaceted role of teacher-researcher that was spawned from the creation of the CRDG. In the article, he stated "the strength of the Center [(ULS)] lies in a structure which bridges the University, the schools, and the community" (King 1967).

This "structure" between the University, the schools, and the community can be significantly transformed through a process of engaging these entities towards designing a ULS learning environment specific to education for sustainable development using the principles of sustainability and King's success strategy. In other words, the planning process to renovate the campus would ideally engage the entire school community and the UH expertise (with an emphasis on the students).

To instigate a student movement to become involved in the planning process, the high school students of the 2014 Project Pono (ULS 2014) class conducted an energy audit and school-wide survey seeking ideas for designing an enhanced learning environment. While conducting the elementary energy audit, the students documented many unsustainable aspects of the ULS's facilities and received feedback on design flaws from teachers and administrative staff. From the brief involvement of the students of the Project Pono class it became evident that much can be gained for developing a community appropriate learning environment *versus* contracting a consultant to plan de campus redesign without an intensive community consultative process.

In addition, the ULS community includes 10 University of Hawai'i campuses also in the process of mapping out new sustainable approaches. With the assistance of the Statewide expertise, curriculum researchers can design an educational model that fits the tenet of Arthur King Jr., who stated that "the classroom as a community of scholars and cast each student into the role of authentic practitioner" (COE 2012).

This echoes John Dewey's approach, which appears to be recognized as a highly appropriate approach in our present times (Campbell 1995; Ryan 1995; Ehrenfeld 1996; Seigfried 2001; UNESCO 2005; Talisse 2007; Morse 2011). The UH community includes the Hawai'iuiākea School of Hawaiian Knowledge and the East West Center, consisting of a "diversity of responses" (Tan 2011) that could assist in guiding the transitional process towards participatory, sustainable Hawaiian and cultural diversity perspectives. The role also is an opportunity to give the ULS children and youth a boost towards empowerment through the kind of participation envisioned by *Agenda 21*. It presents a new partnership objective with UH that can aid all campuses advancement towards sustainability.

The growing consensus that learning in an environment of sustainability will have a higher success of cultivating a sustainable mindset (Hardy 2010) when a total campus redesign and retrofit is undertaken. It will ultimately address such issues as Hawai'i's statewide need to replace its costly and unsustainable dependency on imported oil and coal with energy generation. Therefore the ULS renovation process has the potential to turn the ULS into a research institution specific towards establishing an efficient process in creating a *world leading model for sustainable development education*.

To emphasize on one of King's keys to ULS's success, its affiliation to the University, the ULS can tap into a well established sustainability model where the UH students have proven to be a catalyst to the sustainability movement.

## 5. The University of Hawai'i sustainability movement

One of the key factors in the UH sustainability movement is student participation supported by UH policies. The University of Hawai'i of Mānoa (UHM) is a fully accredited research university of international standing, guided by a strategic plan emphasizing the uniqueness of being grounded in Native Hawaiian knowledge and values, including the tradition of reciprocity. This approach earned the UHM being recognized as a leader in reaching out to communities in Hawai'i and the Pacific (UH 2011). Thus, UHM appears to be taking an early lead in the sustainability movement.

### 5.1. The Office of Sustainability

UHM's sustainability movement gained momentum with the formation of the Office of Sustainability, which was located in the Energy House. This breathed new life into the Energy House which had lost attention and become an aged relic of the progressive thinking behind it. From this headquarters, which remained in need of much repair, Bruce Miller, Director of the Office of Sustainability, and Linda Day, initiated many projects which engaged students. They coordinated the draft of the *Charter of Sustainability* (2003) which was an outcome of two strategic planning sessions. The planning sessions involved over 1000 faculty and administration personnel, students, and individuals from the community. The sessions were instigated by the UH President's Office and Mānoa Chancellor's Office in early 2002.

### 5.2. The Charter of Sustainability: stewardship based on island values

To emphasize the urgency of need in adopting sustainability measures, the *Charter* labeled Hawai'i as "the endangered species capital of the world", and "the extinction capital of the US". The University, as a research university dedicated to educating future leaders, therefore has the ultimate responsibility to lead society onto a path of sustainable development. The *Charter's* mission became the guiding principle: "the University of Hawai'i will apply the principles of sustainable design and environmental stewardship to all of its activities. It will become a leader in Hawai'i and the Pacific region in education, research, extension, and community collaboration related to sustainability".

The *Charter* became the UH's version of *Agenda 21* as it laid out a framework outlining the issues, opportunities and action plans divided into strategic goals: i) sustainable buildings; ii) promote alternative transportation; iii) minimize material waste; iv) adopt green purchasing policies; v) enhance the quality of the campus experience; and vi) teach the principles of sustainability".

Nine committees, with a membership consisting of faculty and administrators from many departments, students, and community members, were formed with each committee working on one of the strategic goals (University of Hawai'i 2003). Under this plan the following statement went into effect: "from this day forward, the University of Hawai'i, acting through its statewide campus network, is committed to the conservation, sustainable use, and enhancement of the local, regional and global environment for the present and for the future. We will meet our commitment through leadership by example in education,

research and environmentally responsible operations. We will engage in equitable and participatory partnerships with the community to enhance our unique culture. We will ensure social and environmental equity and justice while supporting a diversified and sustainable path of economic development. Ultimately, we will design, build and administer our campuses sustainably, in order to preserve and restore our unique and delicate ecosystems”.

### 5.3. *The Sustainable Saunders Project*

Student participation is best reflected in the Sustainable Saunders Project (CSS 2009). Shanah Trevenna, a student of Political Science, used her studies in direct application to the immediate learning environment, which were the classrooms of Saunders Hall. Significant progress was made under her dedicated leadership to include the UH student body and create a UH system-wide sustainability movement.

Two common student complaints were over lit and cold classrooms (Nixon 2007). Using this feedback, she found that the Saunders Building air-conditioning operation was calibrated to accommodate business attire (full length pants and suit coats) and the lighting “exceeded the IES recommendations and legal limits set by City and Country of Honolulu ordinance” (Wolfe 2008). That information led to adjusting the air conditioning setting along with reducing the number of fluorescent lamps, without adding an operational cost, resulting in an annual energy savings of over 500,000 kwh, and retrofitting water savings devices amounts to over 100,000 gallons of water/year with a payback period of 10 years (Trevenna 2009; Public Policy Center 2010). This is an example of *education energy* ( $e^2$ ), a concept of student empowerment initiated by Jonathan Fritzler, another motivated UH student

### 5.4. *The East West Center*

A similar story is found at the East West Center where a student body, working with the dormitory facility maintenance staff, instigated a sustainability program for that independent campus (EWCPA 2009). Energy consumption was reduced by retrofitting the dormitory common areas with activated lighting and encouraging students to be conscious of their energy consuming habits. Acting on the recommendation of one student, the annual telephone book exchange requirement was reduced from over 400 telephone books (one per room) to less than 100 (one per unit). These are prime examples of mindful savings instigated by the sustainable mindset.

### 5.5. *Student engagement: a key component towards ESD*

A common ingredient for the success of these programs is student-led participation. The student-led projects are an option for any academia administration to reverse the projected rise of tuition fees (Board of Regents 2012) through cost savings achieved by directing professors to focus their lessons towards applicability on campus sustainability ( $e^2$  2013). Building leadership at the primary school level (Spillane 2005) would carry over into the University environment. Therefore, the ULS could use the same approach to engage the students to address their campus sustainability challenges. This fortifies the strategy of implementing the empowerment of the major group, children and youth (ULS student body).

## **6. Hawaiian traditional resource management: Hawai‘i, the hub of aloha, seedbed of sustainability**

Another unique asset within the greater Hawaiian community for the ULS development project is that there are people who still retain the Hawaiian epistemology, a knowledge grounded in sustainable values. This attribute is highlighted in the University of Hawai‘i’s strategic plan (2011-2015), as a measure to establish a unique quality not available to all other non-Hawaiian universities. The University recognizes the need for the campus community to be guided by Hawaiian values to achieve a more sustainable campus. In support of this approach, indigenous wisdom has been recognized to be as important as western science, especially when related to environmental practices (Grinde and Johansen 1995; Snively and Corsiglia 2001; DESA 2009).

In the pre-contact period before the European and Asian influx, Hawaiians had a complex social order that appeared highly sustainable. Information transfer was an intergenerational process that cultivated knowledge and spiritual awareness (Young 1998). The Hawaiians had a deep connection to the land as evidenced by their resource management practices that are now being recognized as highly sustainable. Western contact altered the social order dislocating Hawaiians from their land and traditional practices.

After 1820, the missionaries replaced family and occupational teachings by holding classroom assemblies where English and Western acculturation were the focus. The effort was viewed as a mechanism of converting the heathen and savages into civilized Christians (Daws 1968; Young 1998; Osorio 2001).

The evolution of Hawai‘i’s epistemology is well captured in the writings of Osorio, Yamauchi et al., Menton, Aluli Meyer, and Chun. Chun (2006) captures the Hawaiian educational values before western influences, Osorio (2001) and Menton (1992) capture the transitional period, Aluli Meyer (2003, 2007) emphasizes the importance of revitalizing the Hawaiian epistemology to address the declining state of Hawai‘i, and Yamauchi et al. (1999) draw our attention to a ray of hope of keeping Hawaiian culture alive through education.

To begin with, Osorio gives us a snapshot of ancient Hawaiian cultural development, referring back to Polynesian origins and jumping to Hawaiian unification under King Kamehameha I. He enlightens us about the social structure that developed to survive, given the limited resources of the islands. He highlights the cultural belief, referred to as *Malama ‘Āina* (cherished land), that persisted throughout this period of time, likely over 2000 years, which tied the agricultural communities dependence to the health of the environment. Chun (2006) draws from a credible source, *Nānā I Ke Kumu* (Pukui et al. 2001), to give us a view of the pre-westernized Hawaiian tenets of knowledge development, which include *observation* (*nānā* or *‘ike*), *listening* (*ho‘olohe*), *reflection* (*pa‘a ka waha*), and *questioning* (*nīnau*). Returning to Osorio’s (2001) description of the “Beginnings”, one can assume it was the role of the chief to establish the framework of the education system for the community. One can also assume that much knowledge was transmitted as in most cultures, where it is passed down from the elders to the children through oral stories and demonstration practices of agriculture, hunting, home economics, etc. These principles of learning are also reflected in the knowledge development practices of the North American Native Indians described by McGaa (2004) and the emerging discoveries in neuroscience (Siegel 2012).

Under this epistemology, social practices used the laws demonstrated by nature to integrate into their lifestyle, and comply with those laws. Both Hawaiians and Native Americans observed whole systems of nature to model their activities. This is becoming evident as a superior methodology in comparison to the reductionist approach used in the modern scientific method, with its emerging side effects. An example is the superiority of the ancient water management system (*ahupua‘a*) developed by the Hawaiians, when compared to present day systems, which developed under conventional scientific advances.

Menton (1992) enlightens us about the infusion of American missionaries into Hawai‘i and their role creating a schooling system to establish the tenets of Christianity and civilization (p. 218). According to her sources, it was when Hawaiian adults lost interest in learning that the missionaries turned to teaching the children. The children soon developed the same resistance as the Hawaiian adults after their exposure to the teachings. The young royalty’s behavior to the teaching style appeared to echo the teaching challenges in today’s society, where the parents and grandparents roles have been replaced by teachers in a regulated environment.

To cast a ray of hope, we turn to Yamauchi et al. (1999), where her article portrays the resilience of a people who will not allow history to bury their culture, and links the importance of educating in the Hawaiian language to achieve cultural preservation.

The residential schools of Canada and the USA, that assimilated the indigenous peoples into the western culture, are a prime example of using education not to benefit the individual, but to achieve politically driven agendas. The residential schools should be used as a model to assess if educational processes reflect a brainwashing or empowerment pedagogy. Much literature recommends a new way of thinking that requires a shift from linear or reductionist thinking to systems thinking (Sterling 2001), a process for a sustainable paradigm.

Aluli Meyer (2007) details the 7 categories of intelligence related to the Hawaiian culture. One of the principal ones is *‘ānia* (land), “the one which feeds”. The concept of our relationship with the land has a significant impact on how we interact with the environment. Viewing land as property or real estate makes it an expendable commodity which deviates from the traditional Hawaiian notion that land is the source of life to be managed by the community in accordance with that value. Another category of intelligence is *‘ike* (knowledge and traditions). This principle is captured in the “*Worldwide Voyage*” of the *Hōkūlea* and *Hikianalia* (2012-2017), resurrecting the Hawaiian mastery of navigation and discovery. The mission of these voyages “is to navigate towards a healthy and sustainable future for ourselves - the

Hawaiian Islands - and our island Earth through voyaging and new ways of learning". These Hawaiian values strike the core of sustainable development.

### **7. Applicability of a public participatory process towards sustainability: the research project on "Inspiring Education: a Dialogue with Albertans"**

An asset to aid in the success of the ULS redevelopment project is its student body of children and youth. Society in general has a tendency to overlook or silence them, while being led by experts. In its broad framing, the UN global model of sustainability is dependent in expanding the participatory parameters to children and youth, recognizing the historical absence of including them in policy development processes. The inclusion of this "major group" is also a path to attain equality. Establishing an equitable human rights system is most likely to occur under education development theories framed under the lens of capability-building (Blagescu and Young 2006).

Community engagement is recognized as a key component of building a sustainable future (Agenda 21 1992), therefore public input in government policy development provides an opportunity to engage the civil society. Processes to engage the groups that have been historically left out of policy development, such as children and youth should be given top priority for input measures. A two year program was conducted in Alberta, Canada to solicit public input to generate policy for education reform. The assessment of the program provides insights on how to better engage people, amplifying the voices of new perspectives.

To document the perspective of youth on education, the 2009 Global Youth Assembly in Edmonton, Alberta gave researchers (Dian Mitrayani-Northern Illinois University and Robert Peel-UH) an opportunity to design and conduct a workshop. The workshop was a modified model taken from the Inspiring Education: A Dialogue With Albertans (IE) program, a provincial public input process for educational policy development. This workshop, which attracted 19 national and 1 international (Ukraine) participants, was facilitated by 6 skilled facilitators, and followed the IE workshop format by having the participants discuss their experience of the education system and what education means to them. The last exercise was to build a dream school. The proceedings of the workshop captured a new direction for schooling. A report of the workshop outcomes was submitted to the Alberta government in the fall of 2009 to be included into the IE survey. The following summary conveys some of the information included in the report.

#### School Experiences

- Education serves as an opportunity to careers, as a compass, global connection, and key to possibilities
- School acts as a disconnected institution with little bonding between students and teachers
- School is memorization, a fast food curriculum and grade oriented
- Students are the receivers of information
- School environment in unsustainable structures felt comparable to being in a prison

#### Vision of Dream Education

- Nurture creativity
- Democratic
- Interdisciplinary
- Connect with nature
- Humanity aspect of learning - car curriculum, culture of peace and spirituality
- Constructive thinking
- Equal access in education
- Teachers as facilitator and students as co-teachers
- Collaboration between students, teachers and community (ensuring inclusion of elders) for education development

- Flexibility - freedom to learn what the student is passionate about, students as partners in curriculum development
- Sustainable and natural environment schools (green schools)

Lessons learned from the IE process include improving ways to engage marginalized and youth populations. Since they are prime stakeholders, it is recommended their input be given a higher weight factor towards policy development. Such a process, with modifications based on the insights of the workshop, could be employed in the ULS's redevelopment planning process. The process also stimulates the students' involvement in real world issues that will follow them into university or society, giving them leverage to become "change agents" to address the challenges facing the community they live in (Taylor 2009).

## 8. Conclusion

The strategy of *Agenda 21* is to attack the causes of distorted social and economic development by 1) shifting the economic rationality program of industrialized societies to a sustainable development paradigm 2) utilizing perspectives that have had little influence in centuries of policy development. According to historical and archeology records, policy development has been dominated by adult males for millenniums (Eisler 1987). *Agenda 21* directs national governments to change this dynamic by empowering and engaging the qualities inherent in women (nurturing), youth (innovation) and the indigenous peoples (environmental stewardship).

The conflicts between nations, that triggered the formation of the United Nations, have escalated to a conflict between nations and the Earth. The mission of the United Nations is to prevent another occurrence of the tragedies witnessed in WWII. Unprecedented threats to the existence of humanity, however, such as climate change, plastification and acidification of the oceans, contamination, economic collapses, and population growth are inducing new stresses between nations and the Planet itself. The precepts of Universal Declaration of Human Rights (1948), the UN's first international agreement, have now escalated to include protecting the Earth (Vidal 2011). This trend has triggered an international movement to adopt a sustainable development paradigm. Governments, non-governmental organizations, scientists, schools, universities, and individuals are joining the movement with the goal of inducing world-wide cooperation to find solutions to growing issues. The University of Hawai'i appears to be aggressively taking measures to change its modus operandi with a vision of becoming a leader in sustainable development (Hindshaw and Meder 2011). Within the UH campus is the ULS, a microcosm needing infrastructure retrofitting to advance the ULS campus into the 21st Century.

Human resource consumption, driven by an economically-driven system of the free market, is escalating development at levels that is altering the Planet's ecosystems to the point of threatening a global mass extinction (Thompson 2010). Hawai'i itself is a microcosm within the Planet that is being impacted by culminating world development. The rise of the reactionary movement to the impacts of industrial processes can be attributed to people pursuing their own research interests in contrast to the research agenda most graduate students are bound, due to the parameters set by funding agencies. An example is Rachel Carson, who reached a wide public audience to convey her findings on the detrimental effects of DDT to natural systems. Her publication *Silent Spring* (Carson 1962) has been cited as igniting the environmental movement (Griswold 2012).

The movement gained international footing with Our Common Future (Brundtland 1987), which articulated a need for a global change. This initiated the international agenda leading up to the formulation of a new world development paradigm. The path to the paradigm is captured in the objectives of Agenda 21 (1992). Under a sustainable development paradigm all development is conducted ensuring that the social, economic, and environmental values are in balance. Building on global human rights, Agenda 21 recognized the important need to include the demographics of people who have historically had little direct input to policy development. Inclusion of these groups (women, children and youth, and indigenous people) has the potential to add new dimensions to manifesting an awakened global consciousness. The UN international collaborative to formulate a sustainable development paradigm, by addressing threats to humanity, is gathering the perspectives of these groups through their multifaceted programs and websites. As this movement grows exponentially in the number of participants and the volumes of data that are accessible to all, the movement is manifesting the education that is spelled out by the UN Declaration "for the maintenance of [global] peace" (art. 26.2).

This notion of individual empowerment manifesting a different reality is articulated from educational leaders, as the likes of UH's own Dr. Aluli Meyer (2007) to being portrayed in documentaries such as *What the bleep do we know?* (Arntz et al. 2004). Another way to frame this notion is the consideration that history would not have been so dominated by conflict and wars if women had equally been involved as policy makers and leaders.

Based on the assumption that our education system has been mostly influenced by the paradigm it has been formulated under (the male dominated Industrial Age), the analyses of knowledge development frameworks offer an understanding of the cause of intellectual direction. The need to analyze the basis of our knowledge development is also reflected in the writings of scholars such as Manulani Aluli Meyer (2003), Ray Kuzweil (2001), and Daniel Siegel (2012). Hawaiian epistemology, where intelligence emanates from an intergenerational community collective that understands its relationship to the Planet, appears highly applicable towards inducing an education for sustainable development.

The steps to transform the educational system towards education for sustainable development are:

Step 1: Re-connect our learning populations to the natural world (green schools).

Step 2: Provide an environment for individuals to explore, nurture and empower the talent each person brings to a community (curriculum co-developed between teacher and student).

Step 3: Guide knowledge development by providing a learning framework that stimulates student engagement in developing their individual innate passion.

The research on the comparison of knowledge development frameworks concludes the most conducive framework to empowering individuals towards education for sustainable development is one traditional indigenous people used. In this framework, knowledge is developed through learning from traditional knowledge passed down from generation to generation, observing the natural world, and practical application. According to the key elements of Agenda 21, this is a cornerstone to achieving sustainable development by world consensus (UNESCO 1996).

Children and youth, who are viewed as the hope of the future, would be given a higher priority to convey ideas. Their future should be further nurtured by educating them in sustainable environments. The Finnish School system, ranked top in the world, accomplishes this by engaging students in a relaxed learning environment (Wagner 2012).

Mindfulness learning is another strategy that blends well with a reconnection to nature and allowing individuals to discover their intelligence –talents– (Atthayanun 2008). The McGaa framework (essay on compared frameworks of knowledge development) rooted in nature and reflection, influenced by local (Hawaiian) values, in combination with King/Brownell Liberal education approach, form a strong learning foundation to build a sustainable development mindset.

This combination of parameters indicates that the ULS is in a unique position to be a prime candidate to join the global movement as a research facility in testing and developing education for sustainable development programs. Further, to test the programs effectively, the students' reconnection with nature could be accomplished by housing them in a complimentary sustainable environment that capitalizes on the uniqueness of the Hawaiian ecosystem (one of the best global locations to experience nature). Employing an architectural design that induces exceptional academic performance should aid the overall learning experience.

An effective way to arrive at such an innovative, locally appropriate campus design, that has the potential to surpass accolades of the Green School Bali, is by using the Alberta community capacity building model, modified to reflect Hawaiian values. This model would employ all available resources from 1) the ULS (faculty, parents and students), 2) the University of Hawai'i (faculty and student populations), 3) the East West Center's faculty and student populations, 4) the faculty and students of the Hawai'iuniakea School of Hawaiian Knowledge, and 5) the local community of interested stakeholders (including contractors, engineers, architects, politicians, retired educators, etc.). This is the UH's approach of their capacity building exercise to confront their sustainability challenges. Success is occurring to a degree. At the 2005 Sustainability Retreat, the scale of the challenge was daunting with a noted tendency to slip back into business as usual. Even with the creation of the Energy House and the Hawai'i Nature Energy Institute over 40 years ago, little evidence is seen in the Hawaiian development scene that the forward thinking of these initiatives has much influence. To address this tendency and make sustainability a

potential game changing process, the ULS should become the central focus of the University of Hawai‘i’s system. It could become a manageable model of a sustainable campus emphasizing its importance as a UH feeder school producing top scholars, whose innovative traits continue to evolve humanity towards a prosperous future.

This exercise has the potential of catapulting the ULS and the University of Hawai‘i into leading global educational institutes. By treating the ULS redevelopment as a top priority, the ULS has the potential to become a generator of youth leaders who have honed their talents to their full potential through a democratic, sustainable, experiential learning environment. The result becomes community engaged, mindful scholars entering into the University of Hawai‘i system, elevating its status to a world class institution. This role amplifies the mission of the Worldwide Voyage (PVS 2014) towards sustaining humanity by “Uniting the World with Aloha” (UNA 2015) and establishing a leading design of education for sustainable development. The students graduating from this educational environment, guided by indigenous wisdom, not only have the potential to become catalysts of sustainability; but also the seeds of the Equality, Peace and Prosperity Age!

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