The Green School Effect:

An Exploration of the Influence of

Place, Space and Environment on Teaching and Learning

at Green School, Bali, Indonesia

by

Marian Hazzard and Ed Hazzard
with Sheryl Erickson

TABLE OF CONTENTS

The Green School Effect:

An Exploration of the Influence of
Place, Space and Environment on Teaching and Learning
at Green School, Bali, Indonesia

If we want children to flourish ...
we need to give them time to connect with nature
and love the Earth before we ask them to save it.
--David Sobel

ABSTRACT

Green School is an international school in Bali, Indonesia dedicated to empowering global citizens and green innovators to take responsibility for the sustainability of the earth. In December of 2009, Green School's Consulting Director, Ronald Stones, asked the Powers of Place Initiative to conduct an independent study to take a close look at the school and explore the influence of place, space and environment on the experience of students, teachers, parents, administrators and other members of the school community. The study would further the school's own understanding of itself as an educational institution. It would also identify ways in which aspects of this particular learning environment could be transferred to educational institutions in other places.

Two researchers visited the school in October, 2010 to gather and interpret data as part of a qualitative study. They use a descriptive approach to gathering and interpreting data. Forty-three interviews were conducted with students, teachers, administrators, parents, and founders of the school. The researchers also observed classroom dynamics and school activities and photographed the physical setting. The interviews and observations were analyzed to determine underlying "enablers" of learning and teaching at the school.

Specific aspects of the educational environment that were examined include curriculum and instructional approach, the natural environment, the design and construction of the buildings, the intentions of the founders and the cultures of the school and Balinese communities.

In addition to presenting the results of the interviews and observations that include many verbatim quotes, the report is a resource for educators, architects, eco-psychologists and others interested in how place, space and environment contribute to satisfying and enhanced learning and teaching in a Pre-K-12 school. The study includes a review of literature, graphics and charts, references and recommended reading lists, a glossary, maps, questions used in the interviews and parent survey as well as questions for further research and inquiry.

GREEN SCHOOL TODAY

Heart of School green school gallery

History, Mission and Vision

Green School is an international school that serves children in grades Pre-kindergarten through 10 (and, ultimately, grade 12). Its mission is "empowering global citizens and green innovators who are inspired to take responsibility for the sustainability of the world." John and Cynthia Hardy founded the school in 2008. The Hardys, who have lived in Bali for thirty years, founded and managed a successful Balinese design-based silver jewelry business before making the decision to invest in founding and creating a school.

In 2006, when global warming and climate change were becoming issues of growing concern around the world, the Hardys saw Al Gore's *An Inconvenient Truth*. The film convinced them that they must take action. They decided to create a school that would serve as a model for schools all over the world and educate children to be future leaders in solving problems associated with sustainability. The Hardy's vision was "to inspire and lead in the world of education and sustainability."

Over the next two years they bought the land that would become the Green School campus. They also established a factory on the same land that would process and prepare bamboo for the construction of the school's buildings and also its furniture. The

first few classrooms were built. Administrators and teachers were hired. Families began to enroll their children in the school. Green School opened in the fall of 2008 with an enrollment of 100 students.

Educational Approach

In a 2007 interview prior to the opening of Green School, Cynthia Hardy summarized the educational approach that would be used.

> *We are building the School to create a new paradigm for learning: We want to cultivate physical sensibilities so that children adapt and grow capable, as well as [develop] spiritual awareness and emotional intuition to encourage them to be in awe of life's possibilities…We want this to be our legacy.*

A high regard for the Steiner-Waldorf educational approach inspired the Hardy's original vision of Green School. They had educated their two younger children using this pedagogical model.

> *Steiner or Steiner-Waldorf education is a humanistic approach to pedagogy based upon the educational philosophy of the Austrian philosopher Rudolf Steiner… Learning is interdisciplinary, integrating practical, artistic, and conceptual elements. The approach emphasizes the role of the imagination in learning, developing thinking that includes a creative as well as an analytic component. The educational philosophy's overarching goals are to provide young people the basis on which to develop into free, morally responsible and integrated individuals.*

Steinerian elements are evident today in the practice of teachers in Green School's primary grades, but the overall educational program is not Waldorf in design. The imperative that the Hardys felt to educate children to be leaders in sustainability evolved into an expanded mission and vision. The 2009-10 *Handbook for Families*, (APPENDIX F) summarizes the school's program in a one-page document entitled "Culture of Green School." The following features comprise the key elements of Green School's educational program:

- Learning is by doing.
- The essential skills of reading, writing, mathematics and science are developed to a high degree.
- The curriculum includes the evolution from nature to ecology to environment to sustainability.
- The curriculum emphasizes students getting their hands dirty and getting mud between their toes.
- Students develop into stewards of the environment.
- The geographical and cultural context of following this curriculum within the culture and landscape of Bali is recognized.

Current Enrollment and Staff of Green School

As of January, 2011 230 students were enrolled at Green School, representing a total of roughly 150 families. Thirty-five percent of these families have relocated to Bali to make it possible for their children to attend the school. Twenty percent of the student body consists of Balinese students on full scholarship, a commitment made by the Hardys before the school opened. A total of 26 teachers are employed at Green School. Five are Indonesian. The rest are international. An administrative staff of 12 includes a consulting director and a principal, assisted by financial, human resources and media personnel. Other support staff, 20 in all, include a technology team, food service staff, grounds workers (builders and gardeners) and security personnel.

THE RESEARCH STUDY

How the Study Came About

Dr. Renee Levi, Director of Research and Co-Director of the Powers of Place Initiative, traveled to Bali in 2009 and visited Green School while she was there. Excited about what she saw, she wrote: (Levi, proposal 2010)

> *After speaking with Ron Stones, Consulting Director of Green School, subsequent to my visit, he elaborated on his belief that something very unusual and very important was happening in the learning environment at Green School. He gave several examples, including an observation that children who had difficulty learning in other, more traditional, environments (e.g. children with attention issues) seemed to be able to focus and do well at Green School.*
>
> *This was counter-intuitive, Ron said, as he had anticipated that a richly textured, potentially chaotic, jungle setting would be a distracting learning environment for attention-challenged learners. In fact, he said the opposite appeared to be true. Children were, often for the first time, able to concentrate and work productively on a task at hand. When asked why he thought this was so, Ron…admitted to not really knowing what might account for this effect. He expressed a desire to understand the phenomenon more deeply through a qualitative research study that would provide more detailed and observational information about what goes on at Green School.*

Renee recognized Green School as

> *… an excellent location to observe interaction between person and place. At Green School the integral nature of the natural environment, built environment, and human community appears to be having a significant impact on the learning and development*

that occurs there. The goal of this study is to find out more about the interconnections of people and place in this setting and to articulate reasonable hypotheses of what influences what in this reciprocal relationship. Research focus on reciprocal relationship seems at the heart of further discoveries and insights for place-based education. (Levi, Proposal, 2010

Researchers

Marian Hazzard on steps leading up to Heart of School 0630

Marian Hazzard, a now-retired elementary school teacher, was the lead on-site researcher for the project. Her assignment was to conduct a descriptive qualitative study aimed at identifying the potential influences of place, space and environment on the teaching and learning experience of students and adults at Green School. She traveled to Indonesia in October of 2010 and spent two weeks interviewing members of the Green School community.

Her husband, Ed Hazzard, an architect and science curriculum developer, joined Marian at Green School for the last four days of the interview phase of the project. His purpose was to observe, ask questions and document with photographs and anecdotes the surrounding place and built environment of the campus and additional off-campus structures constructed by the Hardys to support the school.

Scope of the Study

Initially the intention of the study was to focus simply on the influence of place, space and environment on teaching and learning of students at Green School. As the observation process unfolded, however, the school's educational approach and its goal of educating students for sustainability emerged as two additional key influences that should be considered in order to understand what is going on at Green School. The study would be richest and most meaningful, the researchers decided, if Green School were considered in terms of the intersection of all three domains as illustrated in Figure 1. A wider context and a larger aperture through which to view the school should be used to make interpretations and understand the implications of the data collected.

- Place, Space and Environment
- Teaching and Learning
- Future Leaders in Global Sustainability

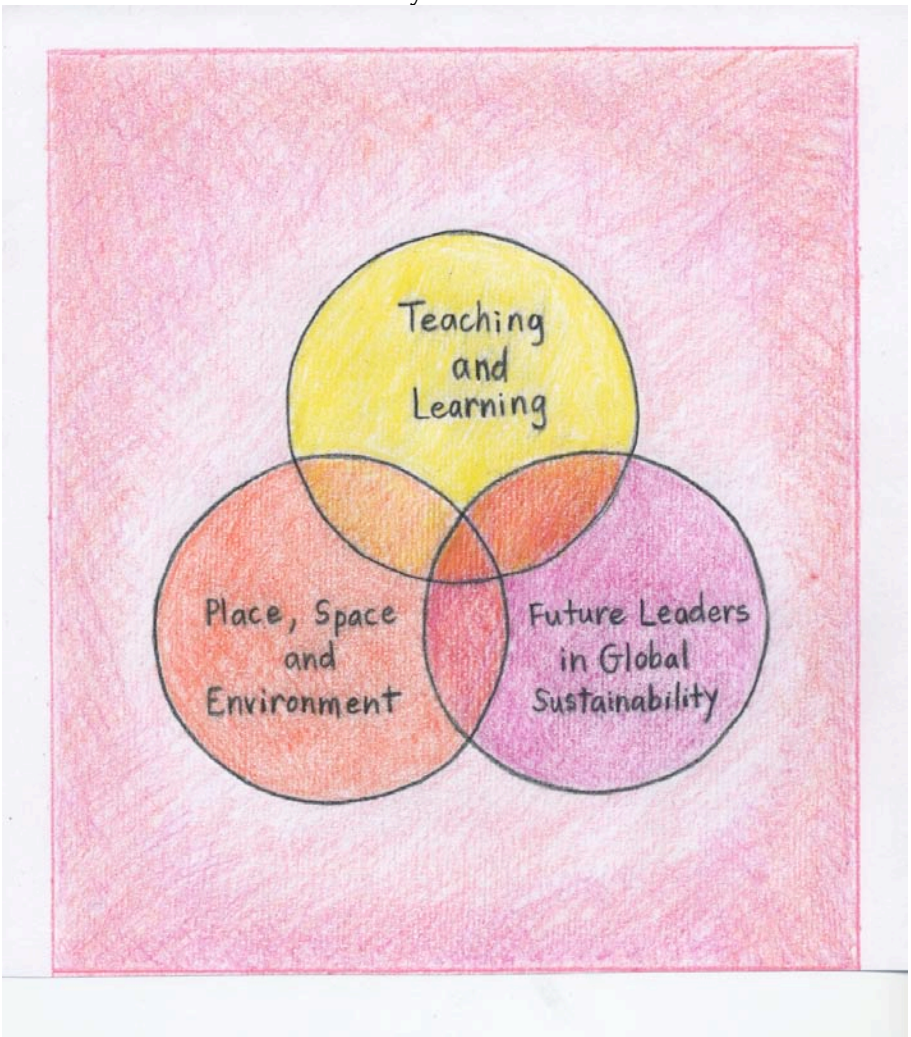


Figure 1: Scope of the Study
(Drawing by Marian Hazzard)

The Cultural Context of Bali (See APPENDIX B.)

Definition of Terms and Glossary (See APPENDIX C.)

Review of Literature (See APPENDIX D.)

The school communicates a distinctive intention: to train future adult leaders for sustainability, while at the same time enabling academic competence and full blossoming of the children and adults who live and work there. The school is an experiment-in-the-making. It is a work in progress, a laboratory and an emerging model of what green schools could be all over the world.

The perspectives used by the researchers were diverse. They included anthropology, architecture, ecology environmental studies, geography, human development, pedagogy, philosophy, psychology, sociology and sustainability, and systems thinking. The study is consequently interdisciplinary and trans-disciplinary, going beyond the constraints of single bounded academic disciplines. The research addresses a complex situation with multiple variables. A systems perspective naturally enriches it.

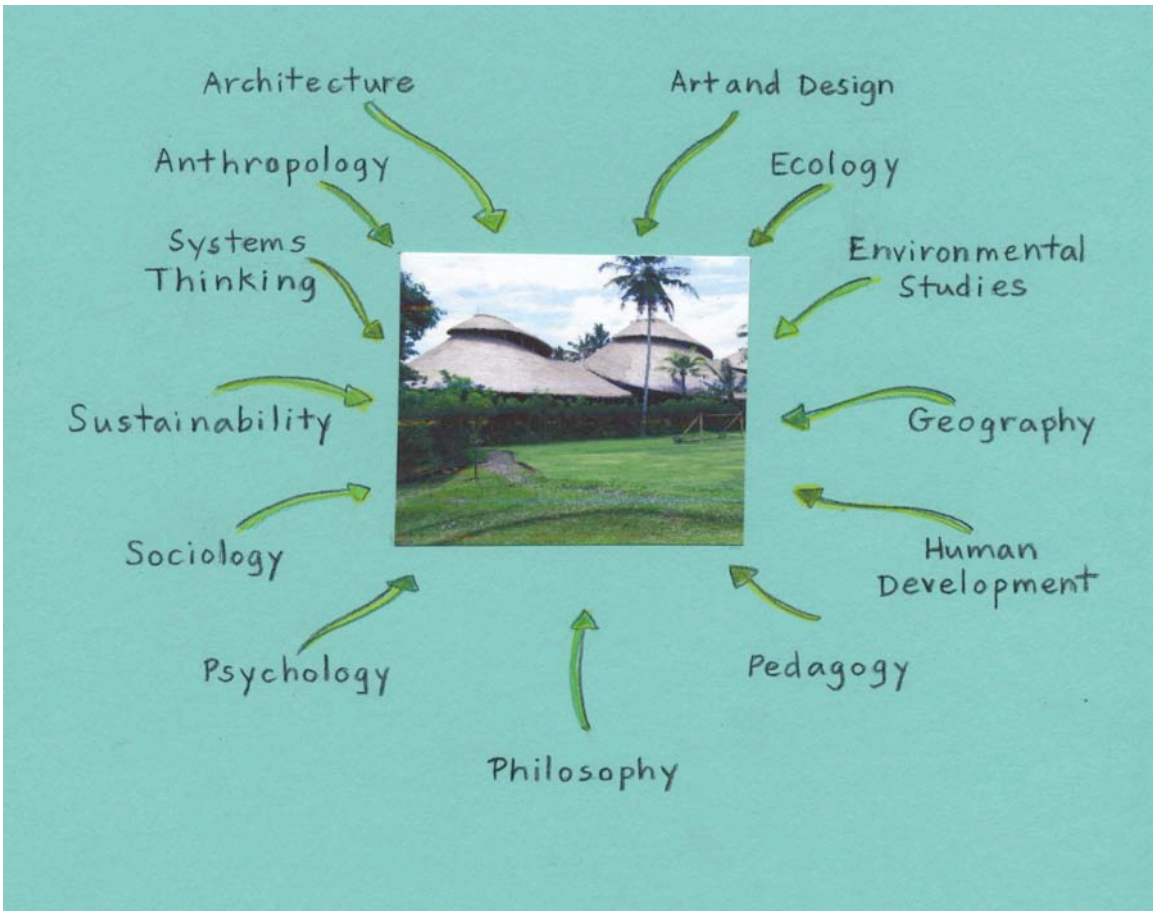


Figure 2: **Multiple Academic Disciplines Inform the Study**
(Drawing by Marian Hazzard)

The Review of Literature looked across disciplines for intersections of research and trends or common patterns that can be used in observing, interviewing and thinking about what some in the Green School community call "the Green School Effect." The Green School Effect is a term used in this study to describe the effects of an educational context in which students and teachers are immersed in the natural environment, in this case, the environment of Bali.

The preliminary Review of Literature searched through databases focused extensively on education with an emphasis on place-based education, sustainability, psychology, architecture, environmental behavior research and the Powers of Place Initiative's collection of resources and research.

It looked for books, articles and related dissertations that would inform and take the inquiry further. This report is intended to be a foundation piece for further investigation and many other types of research such as long-term studies, in-depth case studies, experiments, and outcome evaluations. It has been designed to be rich in content and substantive. (See APPENDIX D for References and Resources for Further Inquiry and Research.)

The Review of Literature showed little if any pedagogical research that defines as complex a study framework with multiple perspectives as does this study. It appears that research and related study designs and observations have been largely limited to the study of populations of older students (middle school through college age) and that these have generally not included the perspectives of teachers, parents, administrators and the surrounding community. Detailed observation and attention to environment, features of the built environment or specifics of the natural surroundings *per se* have rarely been included nor has a systems-oriented point of view been used in either data collection or interpretations and implications.

Related research to date has been primarily phenomenological with some case studies and group comparisons. What is distinct about the Green School research approach is that observations of the physical environment were carried out concurrently with interviews and observations of persons of all ages and varied roles within the school community – from age 4 to senior adults. Contextual factors such as culture, community, design and building process, administration and systems dynamics became important framings of the study. Such a systems-oriented and intricate framing is generally not part of researchers' thinking and therefore not part of related studies.

The data for this study is first hand, gathered from observations and from the voices of the people who live and work at or nearby Green School. Much of the writing and information from related fields is abstract and theoretical. This study, in contrast, is grounded in the words people used to describe their experience at the school in combination with the researchers' observations of its actual physical and natural structures. These create palpable, felt qualities for those who are present at Green School that are sometimes difficult to put into words. They are considered as part of the challenge of the study – to illustrate, to portray and to describe the essence of what goes on for the members of the Green School community.

METHODOLOGY

Research Approach and Process

This is a descriptive study. The data that supports its findings is qualitative. The research process included on-site data gathering followed by data analysis, reporting of findings, interpretation, and suggesting implications. In addition, hypotheses and suggested questions are offered as a foundation and inspiration for further inquiry and research. The intention is to report the research in a way that is engaging and easily understood by the general public and for the descriptive report to be useful to educators, parents and others interested in the interconnections between pedagogy, the environment and educating for sustainability.

Data Collection

Marian attended the staff briefing at Green School at 7:50 a.m. each morning. She spent ten full school days (8:15 to 3:15) at the school and stayed later if a chance to get additional data arose. She interviewed administrative staff, teachers, students, and parents, visited classrooms, observed students engaged in activities indoors and out, and joined the rest of the school for lunch in Heart of School, the central gathering place for the Green School community as a whole. She looked for as many opportunities as possible to get a sense of the school. These included traveling with a class on a field trip to the coast of Bali to release baby sea turtles and attending the Halloween Assembly and party at the end of her first week.

Returning baby sea turtles to the sea 6085

Halloween party 6249

Ed toured the property and spoke informally with parents, teachers, staff, parents and students. He documented features of the built environment with still photography and video.

Pre-visit Survey

Before the visit, Andrew Dalton, Head of Green School, worked with Renee Levi, Marian and Ed to develop an online survey for Green School parents. (See APPENDIX E.) He then sent out an announcement about the project along with a request to parents to fill out and return the survey prior to the researchers' arrival. Twenty-eight surveys were completed and returned. Faculty and staff were informed that visiting researchers would be on campus for two weeks at the end of October and the beginning of November. Both Marian and Ed had permission to interview, observe and photograph at Green School with no restrictions.

Interviews

This central opening question was used to catalyze all in-depth semi-structured interviews:

> ***What influence do you think place, space and environment have on the teaching and learning of students at Green School?***

Renee defined **place (**considered in conjunction with **space** and **environment)** as having three parts: 1. built or man-made environments, 2. nature and natural settings and 3. human communities.

A second central question was asked of interviewees when appropriate:

> ***Could you create a green school in Chicago?***

Other questions that arose naturally in the course of interviews and were addressed informally included:

> What is happening at Green School?
> What is the environment for teaching and learning?
> What is the experience of studying, living and working at Green School?
> What are some of the distinctions about Green School as a place, its spaces and the surrounding environment that may have an impact on teaching, **learning and experience of adults and children?**

The initial question stimulated animated and sometimes emotional conversations with the adults interviewed, seeming to tap deep into the hearts of some. There was a sense of excitement about having this opportunity to speak about their experiences and views about Green School both at length and in some depth. Students spoke more briefly and were more reserved in the way they responded, but all were serious and thoughtful.

When an interview conversation moved in the direction of how Green School's ideas about educating for sustainability in schools could be transferred to other parts of the world, the second question about transferability was asked. This question elicited data about how the members of the school community understand and think about

Green School's larger mission, namely, to serve as a model for green schools everywhere .
Interviews with adults ranged in length from about 30 minutes to an hour. Interviews with students lasted between 7 and 12 minutes. All of the formal interviews were recorded and transcribed. There were additional informal conversations for varying amounts of time with many others in the Green School community. This group included teachers not interviewed formally, members of the administrative staff support team, the school cook and others who worked serving food during the day, one of the school's gardeners and parents, and individuals and families who were visiting Green School on a given day.

Three students from each level from grades 4 through 9 were interviewed. Probing students about their learning issues did not seem appropriate for this set of interviews. Green School's on-staff resource teacher, however, provided details about some of the individual children for whom he provides extra learning support. Classroom teachers interviewed were also helpful in this regard.

Interviewees were selected randomly. A total of 43 semi-structured formal interviews were conducted on-site. Respondents fell into five categories:

Founders		2
Administrative personnel		5
Teachers		12
Classroom	7	
Specialists	5	
Parents		6
Students (preschool to grade 10)		18
		43 interviews total

Observations

Informal observation of teaching and learning at Green School by both researchers was ongoing throughout the site visit. Facilities, the natural setting, learning and social activities were extensively documented in photos. Short videos were also made.

FINDINGS Part I:

The Physical Environment

The physical environment of Green School is interwoven to an unparalleled degree with the mission and vision of the school. Cynthia Hardy described the piece of land that she and John chose to build the school this way:

It was a beautiful place. We loved having the river bisect the land, and there were no tourists anywhere… The power of this land was that it was "untouristed" and had a big river running down the middle.

Their plan was to use the rural, undeveloped nature of the property and Bali's tropical climate to create a school setting in which students would be surrounded by and immersed in nature each and every school day. The natural world would become the context for all the learning and teaching at this school.

1. **The site**

The site is about 8 hectares (20 acres) in total, divided in half by a river in a deep ravine. All of the school buildings are on the west side of the river, and the east side has Bamboo Village (houses for staff), the kitchen, gardens, and the bamboo factory where all of the building materials and furniture for the school are produced.

Green School site with key buildings labeled overall-labeled.jpg

When the property was purchased, the site had no existing buildings. With the buildings of the school now in place, it is still very much part of the traditional landscape. Purification ceremonies by local priests were carried out for all building projects and the river's energy, both real and spiritual, is still considered the property of the village.

landscape: a mixture of forest and cultivated fields 0484

a small temple on the site 0634

2. Entrance to the school

Green School's official entrance is on the other side of the river opposite the buildings. The main drop-off and pickup point is on a small side road at the end of a loose stone path, which is less dramatic but much more convenient.

drop-off and pickup area for students 0583

entrance path; announcement board and warung on left 0580

Heart of School, the administration building and central gathering place for the school as a whole, is visible in the distance – about 100 m. The path leads past the composting toilets and the theater pavilion on one side and the *warung* (open café) and playing field on the other. The *warung* is a primary gathering spot for parents. Within the campus, there are no roads or vehicles in use. Tall palms line the path and edge the field. The immediate sense is of an idyllic rural landscape with no hard surfaces, no enclosed buildings and no machines.

warung (open café) 0737

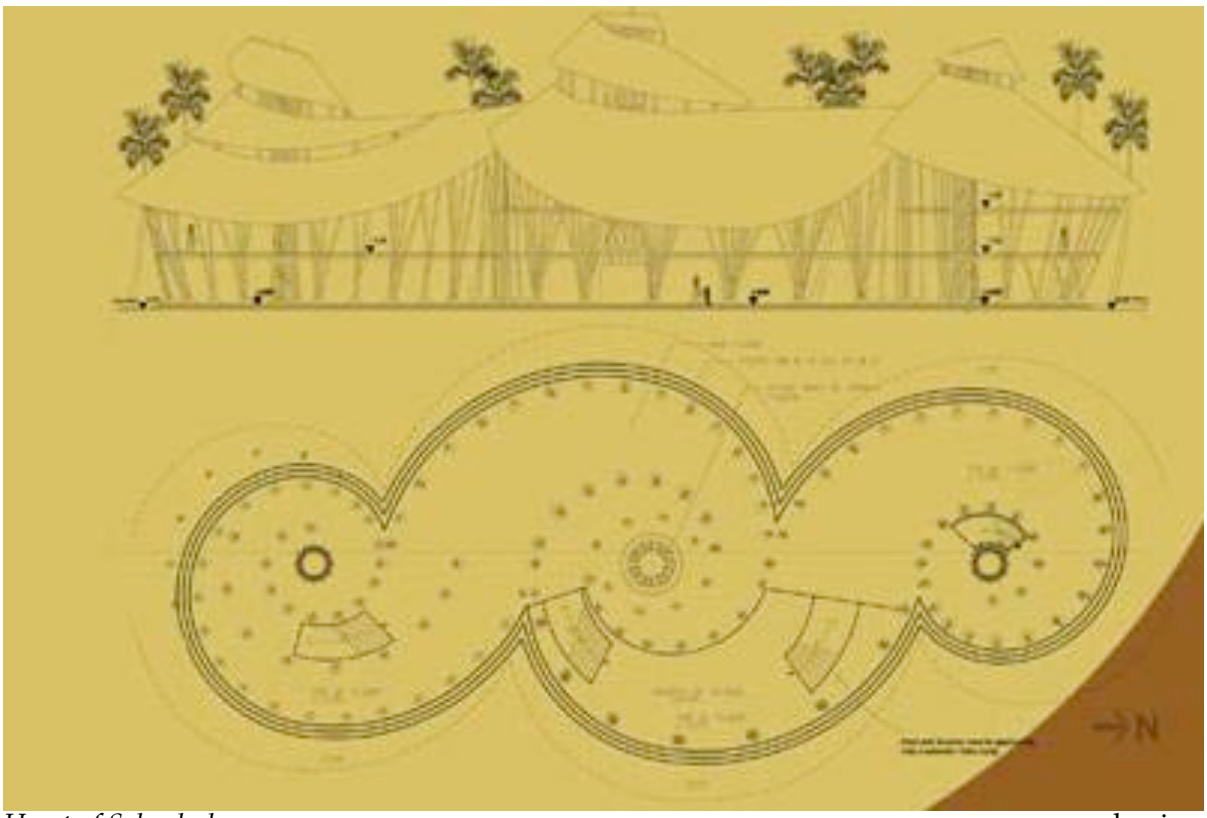
playing field, with warung in background on entrance path 6222

3. **Heart of School**

Heart of School has a monumental quality, but it is gentle in its details. The soaring roofs and dramatic skylights are combined with intimate, child-friendly details such as a "Heart of the Heart" hiding place with multi-tuned piano wires and hanging basket chairs. The building is not intimidating.

Heart of School 0714

Heart of School, built after the classrooms, has become the center for meeting, eating, and administration. It was erected in three months with an onsite labor force of about 80. It consists of three intersecting circles in a spiral pattern, each with a high roof and two levels above the ground floor. The bamboo construction system is the same as for the classrooms, but grander and more dramatic.



Heart of School plan plan.jpg

As with the classrooms, the ground floor of Heart of School is made of hard-packed earth and raised up two or three steps from the surrounding earth. It is a general gathering place, both formal and informal, where everybody arrives before heading off to other places, and where lunch is served.

third floor with skylight 0545

multiple levels 0971

hanging basket chairs 6041

"Heart of the Heart" 0622

The upper floors, reached by broad stairways, house the library/computer lab, several classrooms, and administrative centers. These would be better described as "centers" than "rooms," since they are defined but not enclosed with walls. There are generous open spaces around these centers, however, which give them a sense of being private without being cut off. The few dividers are open bamboo curtains of various sorts.

"wall" of the teachers' room 0910

office space for the technology team 0617

teacher's office 0787

foot of the stairs with shoes 0717

Everyone leaves their shoes at the foot of the stairs before going up to the second and third levels of Heart of School. The flooring of the upper levels is split bamboo. It has some give and irregularity and makes interesting sounds as you walk.

4. Classrooms

The classrooms pre-dated Heart of School in their construction. Now they seem subsidiary to it because it's sited so grandly up the hill from them. Each classroom is a separate building with a different bamboo framework and roof-framing pattern. The materials are the same, however – packed earth floor slightly raised from the surroundings; bamboo structure, grass (*alang-alang*) roof, some rigid plastic sky lighting. The edges have large overhangs and are soft and irregular due to the thick grass thatching. The roof edges vary in height (from 3 to 8 feet), but feel quite low when you're inside because the roof (and hence the ceiling) rises steeply to a maximum height of as much as 20 feet.

classrooms in year 1 classrooms-new-sm

classrooms, 2010 0631

classroom for older students 0722

a classroom meeting area 0776

older students at work in their classroom 0868

Each classroom has different areas that flow into one another as intersecting circles – a meeting area, a larger area with tables and chairs and a "bubble." The bubbles are sunken oval spaces with a built-in bench around the perimeter and a framed doorway. A treated canvas cover can be inflated to create an enclosed, air-conditioned space

within the larger classroom. These covers are generally not in use. The bubble spaces feel enclosed and somewhat set apart even without the cover.

bubble space with cover inflated bubble interior.jpg

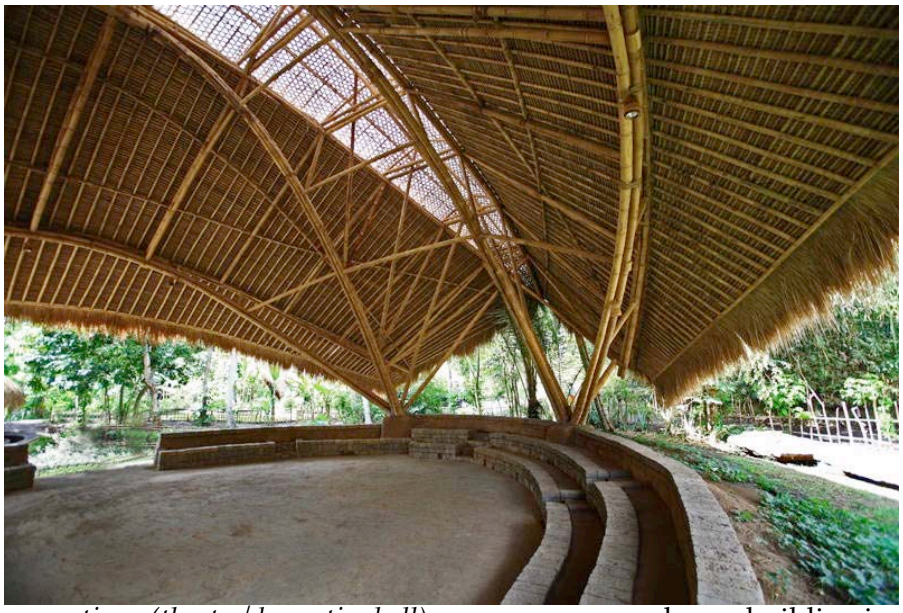
bubble space with cover removed 6155

5. Non-classroom buildings

There are numerous other buildings with specialized uses. Some of these do have walls, indicating more private functions, such as the infirmary, the director's office, the student learning support center and the changing rooms with composting toilets. Other buildings include the *mepantigan* (theater/dramatics hall), a gymnasium (next to the playing field), the *warung* (open café), a bell tower and a parents' *bale* (sitting platform, roughly 3x3 m) like those in Balinese villages. All use the same version of the bamboo construction system.

Principal's office 0752

gymnasium 6260



mepantigan (theater/dramatics hall) drama building.jpg

6. Agriculture

Small farming projects are going on all around the buildings. They include raised beds (vegetables), rice fields along the river, shrubs and trees (coconut palms). The very rapid growth of vegetation in the tropical climate of Indonesia gives the young campus a settled-in look that one would expect after 15 years in a temperate climate. Green School has quite a few Balinese maintenance and gardening workers who look after these projects, and the children are involved in class planting and harvesting projects as well. The feeling is that something is going on and being tended to around all the buildings and along all the paths.

vegetable garden beds next to Heart of School 0618There are also animals in pens near Heart of School, off to one side of the campus: pigs, cows, chickens and rabbits. The shelters are rustic and temporary, in the style of Balinese farming.

7. Connectors

All buildings are connected by footpaths. Vehicle access is either not present or separated from walking routes. The footpaths are all made out of natural materials that are passable in wet weather – loose gravel, stone cobbles and dried earth bricks for steps. They are irregular and bordered by vegetation. Because the classrooms are situated along the hillside that slopes down to the river, there are steps everywhere. Heart of School and surrounding areas (playing field, gymnasium, drama hall), in contrast, are on relatively flat land.

dried earth brick steps 0632

handcrafted steps and stairs 0721

8. Food

Cooking facilities for the school are on the other side of the river, a considerable hike down and up the deep valley. The kitchen, which is quite large, prepares food for the lunch served every day at Heart of School. It also provides lunch to workers at the nearby Bamboo Pure factory (formerly named PT Bambu) that produces all of Green School's construction materials and furniture.

kitchen Green School Gallery

stoves in school kitchen 0802

buffet lunch in Heart of School 6128

Food is also always available for sale at the *warung* along the entrance path. Fresh-cooked snacks are brought from the kitchen. Parents and children spend lots of time there. Parents socialize or work on laptops using Green School's wi-fi network.

9. River

The river that runs though the Green School campus lies in a deep ravine with steep, heavily vegetated sides. On one side are the school buildings. On the other side are Bamboo Village (houses for staff), the kitchen, farming fields and, farther away, the Bamboo Pure Factory.

river in ravine bisecting Green School's property 0732

older footbridge 0881

A grand covered footbridge, in a Sumatran style, connects the two sides. Original access to the school was across the bridge, but now most children arrive at an entrance about 100 meters from Heart of School. The river and ravine feel less central to the ethos of Green School than they may have originally. Nonetheless, the river has a wild, forceful presence when you are near it. Its banks are thick with jungle vegetation. There are rice fields and fishponds just above it along one edge. The Hardys are hopeful that, at a future point, electricity can be generated by a vortex-driven turbine and a water ram will deliver water for farming. In December, the researchers learned that a very large tree had been uprooted in a storm, washed down the river and taken out the bridge in its entirety.

Sumatran style footbridge (original entrance point of Green School's campus) 0733

10. Furnishings

All of the school's furnishings are made from bamboo produced on site in the factory next door.

cubbies (student storage spaces) 0623

library 0608

outdoor wash basin for younger children 0771

play boat climbing structure for younger children 0769

Other parts of the property

Bamboo Village is a collection of bamboo houses set close together in thick vegetation on the other side of the river from the campus. It was created by the Hardys to allow

faculty to live close to the school and be part of a close-knit, creative, sustainable community. The design of each house is different. All were made with a mixture of bamboo structure, grass roofs, some canvas walls and some masonry.

house in Bamboo Village(exterior) 0895

living room 0790

bathroom 0729

bedroom 0796

In an interview a teacher spoke about the experience of living in Bamboo Village.

We go home and we live in a bamboo -- well, it's a mansion. It's very, very nice. We'll probably never live in such a place in our entire lives. It's alive, it's breathing. There's no walls. There's creepy crawlers that come in and out, and bats that fly through and all these distractions that you're not used to if you come from the West…It's changed me to the core. I'm experimenting with my diet now. I'm trying to eat more organic, more healthy. Also, the time of day that I go to bed and wake up is completely opposite here. Both of us were kind of night owls and couldn't get to bed until 1 or 2 in the morning. [Now] we go to bed by 10:00 at the latest. [We're] more in connection with our surroundings

Bamboo Pure Factory was established specifically for building Green School. Now that its construction is mostly complete, the owners are looking for other markets for their furniture and building products. On a piece of property near the school several very elegant bamboo villas are currently under construction for sale to buyers interested in investing in real estate in Bali.

storage shed at the factory 0887

workers assembling split bamboo flooring 0933

Green Camp is an outreach program that is another component of Green School's program. Its goal is to help participants to build a connection with the natural world. During the school year Green Camp offers short-term experiential environmental and programs to students from schools both in Bali and elsewhere in Asia. Green Campers live in round, thatched yurts during their stay.

yurt at Green Camp 0981

a group of Green Camp yurts 0982

FINDINGS Part II:

The Educational Environment

STUDENT INTERVIEWS

Student responses to the question of how they believe Green School's natural setting influences their learning

When Green School students were asked if they believed that the closeness of the natural world to their classrooms affected them as learners, 17 out of 18 said it did in ways that they experienced as positive.

- **Freedom without pressure**

A pattern that emerged from students' responses was a sense of freedom and lack of pressure, which resulted in an ease of focus and concentration.

> Student: *I get to learn out in nature. It's a bamboo building…It's open. It's feels nice. In the car sometimes I get nauseous because of the AC. I like fresh air. It feels better for me. It doesn't feel like you're locked up. In other schools, they're like concrete buildings. It's a square. [Here] you feel like you're free. In other schools you feel almost trapped because you're inside a box. (Grade 6)*

> Student: *It's a great place to learn. It definitely is so much different than being in any kind of traditional classroom with four walls. I guess it makes it a lot easier to focus, kind of. It's about 50-50 actually. It makes it easier to feel a little more open and be a little more willing to pay attention. But it also has one side effect that makes it a little easier to space off and get distracted, like looking out at the trees and stuff, than looking at the ceiling in a normal classroom. Even looking at the ceiling [at Green School] is pretty cool. It definitely makes an easier learning environment. A lot softer. (Grade 10)*

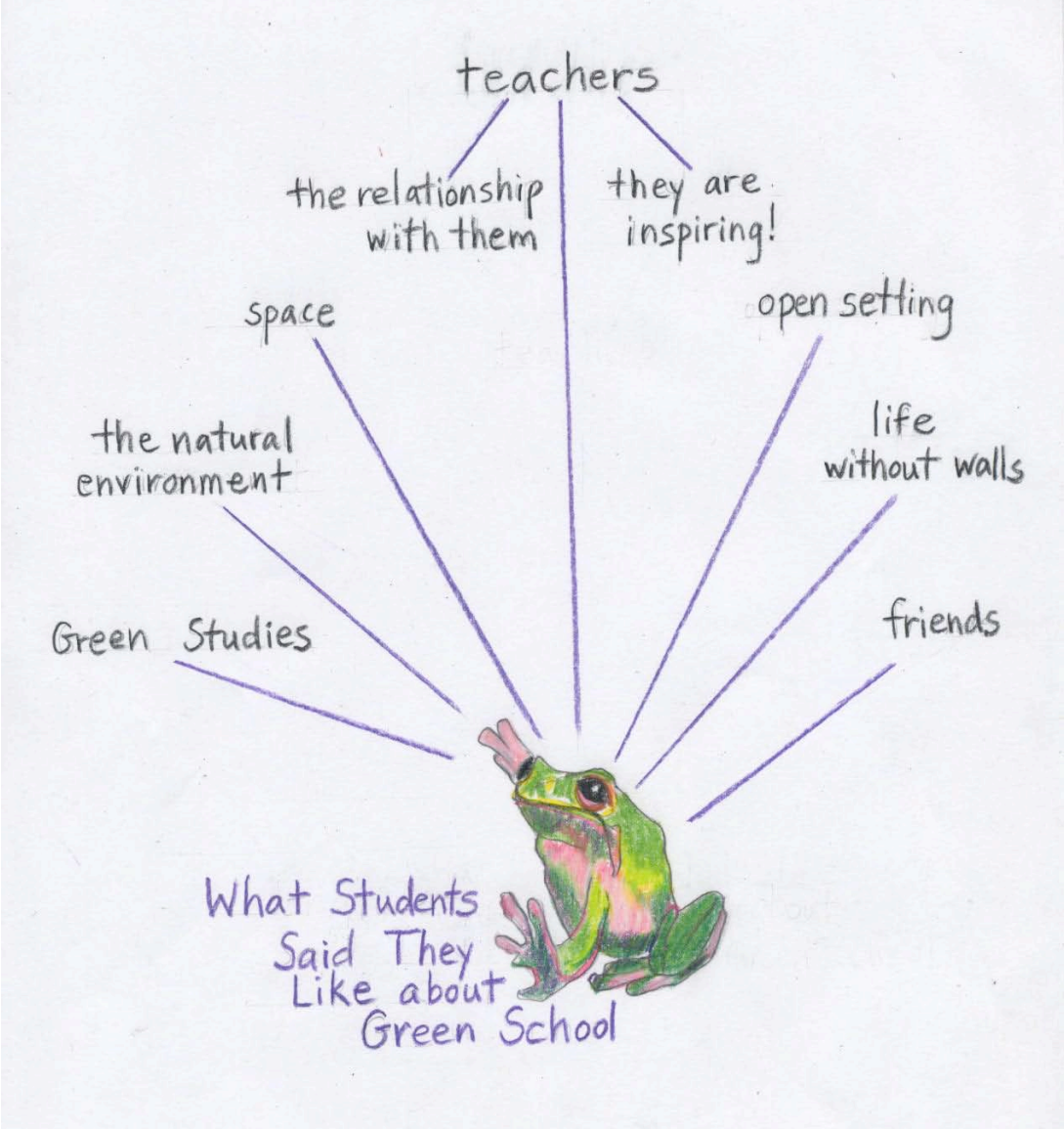


Figure 3: **Parent Survey Response**
(Drawing by Marian Hazzard)

What does your child like about Green School?

- **Intimacy with natural world**

Students spoke about temperature, air and sounds as an important and positive part of their experience in the classroom. Some said that intimate connection with the natural world at school made them feel inspired and able to do schoolwork more easily. A Balinese fourth grader who had previously attended a local school compared it to Green School.

Student: *In my old school it was hot. The wind comes in [here at Green School]…The*

last year, when I was in my old school, we had to wear a school costume [uniform], not free [choice as to what you wear] like this. Here it's inside the village. There it was in the city. I heard cars going swoosh, swoosh. Here I don't hear anything. There's no animals there too. Here there's pigs, cows, horses, chickens, lots of animals… (Grade 4)

Student: *[In my other school] you sit in a room, and all you can see outside is just cars going by and there's a lot of pressure on you. Here you don't have any pressure. It's open. Your thoughts are open. You can share them... The school's created so you can express yourself very easily. It's just open and it's easy to concentrate.*
(Grade 7)

Student: *[Before I came to Green School] I didn't know if sitting outdoors would be good or bad. I kind of like the outdoors – the breeze. I think it affects the learning of kids. I can't picture going back to an indoor school.*

Two Balinese students who entered Green School the year it opened also said that the close and immediate connection with the natural world made doing schoolwork feel less difficult.

#1 *I think when you see nature around you, if you're doing something in class, like if you're writing a poem. It gives you really good ideas. If you just look around, there's tons of ideas around you…I like that it's so open. (Grade 5)*

#2 *Before [I came to Green School] I didn't know anything about this school. I went to this school and I thought I was going to get sick because of the wind. [Later] I went back to my public school for my national exam and it was like, "I can't do these exams because of these walls! I can't see the trees!" I want to have inspiration when I stare at trees, when I'm thinking. The wind helped me more. I don't know why. Maybe it's just me. In math I was always frustrated [like], "Oh my god, this calculation is really hard." I was staring at the trees and then [suddenly], "Oh! I got this!" Like breeze. Maybe it's just me…I don't know. (Grade 10)*

- **Contact with tangible things**

Several students mentioned how much they value the opportunities they have at Green School for first-hand experience and active engagement with materials related to what they're studying. They said that this makes learning both more interesting and more effective.

It's definitely easier to learn about the world here. You can go down to the river and look at fish and stuff and learn about diversity and everything – bio-diversity. You get to go on walks and it's fun. In my old school we didn't have green studies or global awareness. We had something a bit like it, but we didn't get to go walking around and look at animals and stuff. Here, when we're looking at the world, we get more in it.

These two students were Balinese.

#1 *Before I came here, I was a student in local school and it's very different. We just learned and sat in classroom – a lot of theory. When I came here, all that changed. We go out there and we learn. We don't just sit and write something. We learn and do. When we learn about measurement, about rock, we go down to the river and find some rocks. [Before] I just learned the name of the rock, but I never knew what it looked like. (Grade 9)*

#2 Student: *Here I learn about farming"*
Interviewer: *Do you do farming at home?*
Student: *I have a rice field.*
Interviewer: *Does your family grow other vegetables?*
Student: *No, just rice. It's better understanding than just buying it, knowing where it's from and how they grow rice. (Getting animated) Here you make and you plant and you harvest it! (Grade 8)*

ONLINE PARENT SURVEY

Parents were asked the question, ***"Do you think that the physical setting of Green School has an effect on your children's educational experience?"*** The 28 who responded to the survey indicated, either explicitly or implicitly, that they believe Green School's location in nature is having beneficial effects upon their children's experience as learners. The parent quoted below took the broadest view, comparing Green School's overall attitude towards nature to that of "other schools."

Parent: *There's an inherent acceptance of nature in the campus. Other schools have grounds and space but still manage to keep nature at bay*

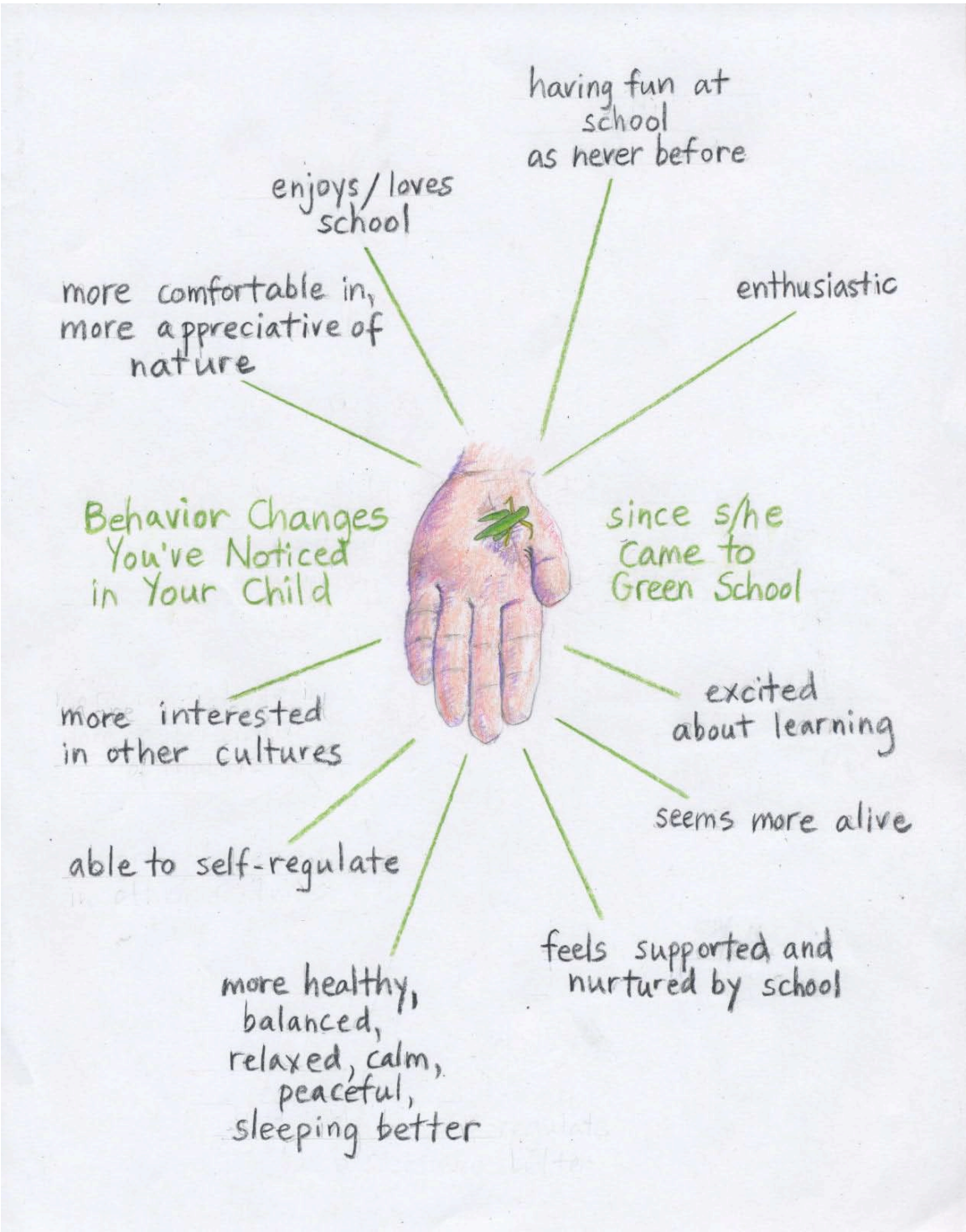


Figure 4: **Parent Survey Responses**
(Drawing by Marian Hazzard)

How has your child's behavior changed since s/he came to Green School?

- **Immersion in nature / Moving air**

Ten parents mentioned the lack of walls in Green School's buildings and how this allows "openness, air flow, breeze and space" which, in turn, gives students freedom to think in a way that enhances learning and creativity and facilitates communication. Those below spoke of their children's close physical connection to the natural environment of the campus and how the educational program is designed so that, as much as possible, the natural world is the context for learning experiences.

> *#1 Yes, it [Green School] is immersed in nature and nature becomes a normal part of her life.*

> *#2 Yes, very much. She is more aware of her surroundings – environment – trees, animals.*

> *#3 Definitely. Closeness to nature, being aware of environmental conditions, learning to see nature as a natural part of their daily experience and sensual perception – weather, changes by season, growth and constant change.*

Five parents noted that the learning environment of Green School is "peaceful, calming, relaxing and quiet" in comparison to that of their children's previous schools. One was ambivalent.

> *I think they are in turns stimulated and exhausted. I think it feels good to them to have the light, the sky, the wind constantly stimulating them. However, the heat and humidity can also be oppressive and draining. My children come back from school exhausted each day.*

- **Aesthetic environment for learning**

The natural surroundings and unusual architecture at Green School were regarded as likely significant aspects of the learning experience of the children of these two parents.

> *#1 I think the whole surrounding of Green School is beautiful, and I think learning and being educated in such an aesthetic environment stimulates at least the sense for nature, beauty.*

> *#2 I would like to think the beauty of the surroundings calms in some way.*

One parent expressed concern that his children will have difficulty transitioning to another, less nature-oriented school when they leave Green School. At the same time, he

said that he believes that their learning experience at Green School is "very positive" and will endure for them long term.

> *Yes, in a very positive way. I think it will be difficult for them to adjust to a conventional environment after this, but I also believe it has shaped their attitude toward nature in a positive way that will be long lasting.*

The two figures below summarize parent responses to key questions on the survey.

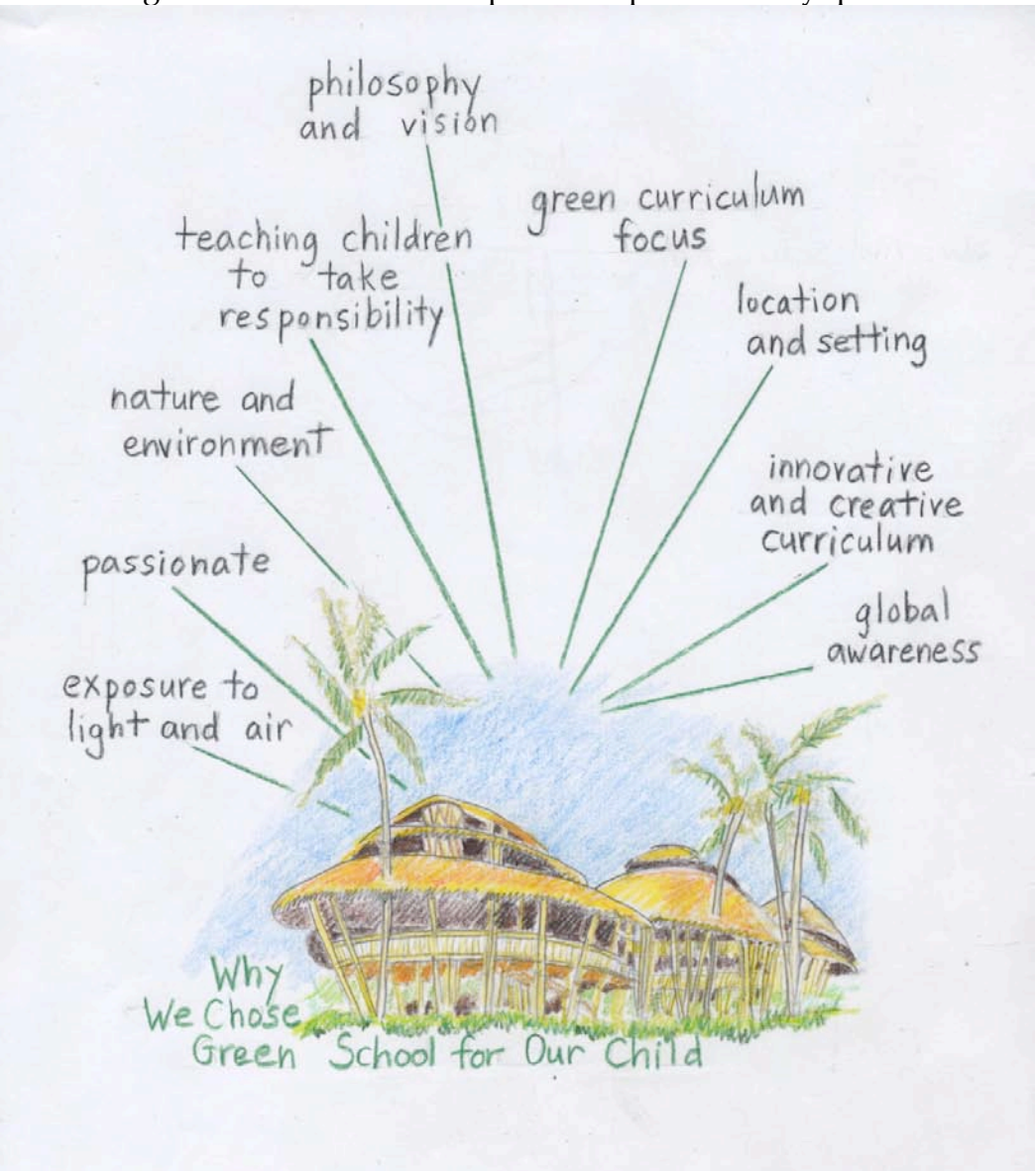


Figure 5: **Parent Survey Response**
(Drawing by Marian Hazzard)

Why did you choose Green School for your child?

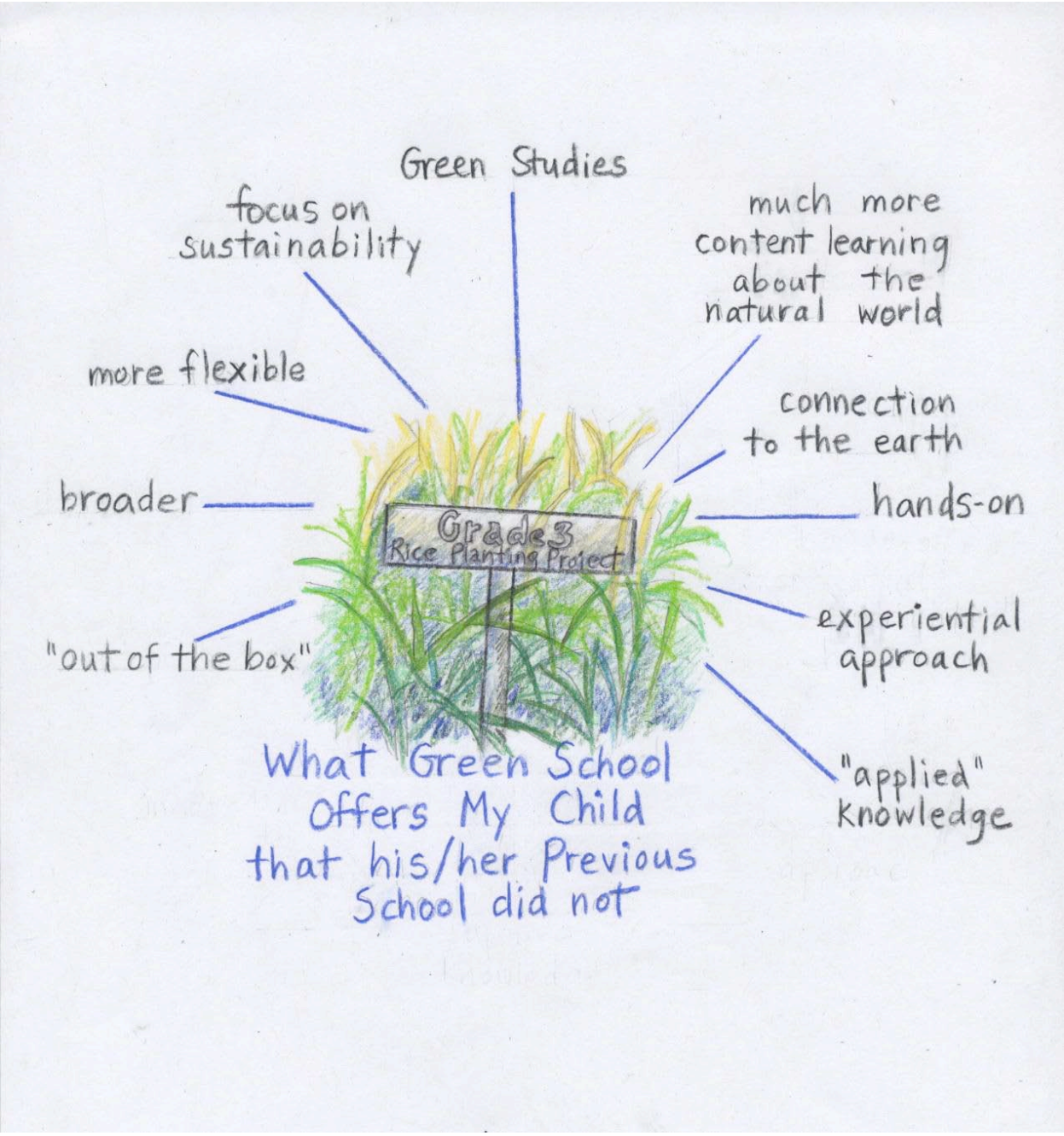


Figure 6: **Parent Survey Reponse**
(Drawing by Marian Hazzard)

What does Green School offer that your child's previous school did not?

PARENT INTERVIEWS

Six in-person interviews were conducted with parents. In addition to having a great deal to say about their children's experiences as students at Green School, parents seemed eager to share experiences about their own schooling and their personal impressions of Green School. They wanted to speak about the influence that place, space and environment were having on themselves. Attempts to redirect the talk back to the influence of place on their children's learning seemed to dampen the conversation somewhat. It quickly became apparent that parents are as involved as their children in the learning experience that Green School offers.

The following responses from parents interviewed in person are taken from those parts of the interview that focused on place as an influence on their children's learning. Note how their conversations often evolve into being a blend of their own educational experiences and what they know of their children's experience of place as Green School students.

- **Students can be their "true selves"**

This mother was struck and very moved by how the natural environment and openness at Green School seems to help students relax into being themselves. What Green School offers her older son is the polar opposite of his experience at his former school where he felt that he could only fail, never succeed.

> Parent: *What I think is amazing about this place is that kids can be themselves, discovering who they are in the natural environment.*

She continued:

> *Once you have walled buildings, everything they say is just so noisy…I was just sitting in the library the other day and was amazed by how so much was going on, yet nature was integrating all the sound. Nature with its own little sounds can somehow put it all together…It's very soothing, like putting you to kind of a rest that you can cope with all of this. It's OK. It's not that 100% of your attention has to be occupied. You can integrate it all.*

Also, not being scared of natural things like mud and rain. We get so…like living in a city there is this attention that goes to the wrong things, like your kids coming home clean from school. "What will the neighbors think?" Here it's like it's even encouraged for kids to get dirty and muddy and wet from rain. We've been so afraid of nature, so detached from nature, and seeing nature as an enemy in the last century. "Don't go there! Don't get wet! Don't go into the mud." Here I really love that they can just play. It's re-educating me. They [my children after three

months at Green School] are already loving it. We still didn't manage to extinguish it [their inborn joie de vivre]!

- **Transparency and informality**

A mother spoke of how helpful the lack of walls in Green School classrooms is to her as a parent. Instead of having to make formal appointments with her child's teacher, she can conduct quick and informal visual check-ins. Because her child has special challenges, this is a great relief. The physical openness of the school's bamboo structures seems also to be a metaphorical openness for her as parent grappling with the closed-off architectural design of conventional school settings.

> *The thing I love about here is that, because of the [openness], you know what's going on. You don't have to have appointments with the teachers. You [can] just walk around the campus...The classrooms are open. I've heard parents say they don't know what's going on, [but] you only have to come and walk around. I don't even have to talk to the teacher. I can just quietly take walks and see what's going on.The body language tells you everything you need to know. It's all there. I love the informality – that you can just come in at any time.*

- **Connection with the natural world is daily and ongoing**

With great enthusiasm, this parent described the influence she sees Green School's setting having upon her young daughter.

> *[Our daughter]…loves it here! We used to live over there in Bamboo Village [faculty housing], and our commute was to walk across that bridge…I'd get goose bumps thinking, "This is the life of my daughter!" We'd chat the whole way. You'd see your environment. You'd see things growing. If you came up those stairs (pointing), you'd see that pineapple [plant] growing right there...She was just really trying to figure it out. I saw her little mind working. I used to volunteer in her class. There were bugs right there. It was like you could be an entomologist….You hear the marimba and the singing, and the bug sounds. I just can't imagine her going back to a regular educational classroom. I'm like, "Oh, no! Where there's a concrete box and no windows?"(with a sigh) I don't know.*

- **First hand experience of systems and inter-connections in nature**

This mother had a more "big picture" point of view. For her Green School offers everything she ever dreamed of finding in a school for her children. Comparing Bali's climate with that of her childhood home in North America, she said

[In reference to how place influences learning] *It [Bali] all has seasons and cycles…Here they can do three rice crops a year. Everything is accelerated here—warm, plenty of rain…Living in controlled environments reduces that connection with the natural environment and cycle of things. This year we hardly had a dry season at all. What I like about that is that it demonstrates a much bigger cycle of things…We've got to look back [in history]. There's a much bigger scale…I've learned that it has to be balanced between science and heart. Not only do plants and the earth go through cycles. Human go through cycles. I try to work with my kids about balance, understanding that things go up and down. Nothing lasts forever, including being happy or sad. Things come back. [My son] said he wanted to make green schools when he grows up.*

A parent who came to Green School to provide a "gap year" for the older of her two children expressed great satisfaction with his school in his home country. At the same time, she was delighted with what Green School was giving both of her children as a one-year enrichment experience.

Parent: [Before coming to Bali, my children said,] *We [already] have such a nice school!…And then they came here. They were thinking about no walls.*
Interviewer: *Was it positive?*
Parent: ***Only*** *positive! When they arrived, they were open-mouthed. Also because of the architecture…They liked so much not to have walls, not to have closed spaces. I thought at first maybe they can't concentrate here because it's so different, all open. You hear noise, birds, you see people walking near the classroom passing by. But they're more concentrated than at [their other] school. They can live with it [the openness] wonderfully. Really a very, very big difference here.*

- **Sense of freedom**.

This vignette from a parent sums up what Green School feels like to its students.

Parent: *One of the things that really hit [our 12-year-old son] when he first came to Green School was when the teacher in English class asked, "What is freedom?" and everyone shouted out, "Green School!"*

CLASSROOM TEACHER INTERVIEWS

The influence of Green School's natural setting on students

- **Innovation and creativity**

A spirit of openness and a willingness to be flexible came through in all interviews with Green School faculty members. One teacher said that she noted those same qualities in the people who make up the school community as a whole.

> *The children here, the school itself, the families it attracts, tend to be very creative, quite open, just up for anything.*

The school doctor agreed.

> *No other school can be better than Green School, letting the children go out in nature, the embrace of nature.*

In considering the question of the influence of place on students' learning, however, he admitted to reservations about the validity of the research study from a scientific perspective.

> *It must be kept in mind that families who enroll their children at Green School are already predisposed to valuing the natural world…I think it's what's called 'selected' by the parents. I think it's the impact of the parents. Selected, not randomness. There's something similar among the parents. They are mostly concerned about the environment.*

- **Close connection between indoors and outdoors**

A teacher described the intimate connection between inside and outside as an integral part of Green School – an unconscious, but powerful component of the total school experience of their students.

> Teacher (Primary): *The difference I see is that when you're in a closed classroom, there's so much out there for children, and their minds wander out. But here out is all here. Out is in. So I feel like when they're in here, whatever 'in' is, they're really in because they've been out.*

When teachers were asked to comment on what they thought were the effects on learning of such a close connection between indoors and outdoors, they spoke of how much more powerful instruction and learning are when concrete examples of the content of the lesson are literally just outside the classroom door.

- **Authentic experiences in the real world**

Teacher (Primary): *Children really are not just inside the classroom. They're not just thinking about what they're doing in the classroom. They're thinking about what we have around – gardening [for example]. And they do a lot of writing about what they've done. Everything is very contextual.*

classroom garden work 6223

Teacher (Older elementary): *I think…getting kids out into nature…is so important because, when you talk about rivers or rainforests or whatever, it has so much more meaning, and they care so much more about it.*

Teacher (Primary): *Another thing that I think is so important that happens with children [at Green School]: [In my former teaching settings], gardening was a chore because gardening is not a natural thing…But here gardening is a way of life. The children become mini-experts…You just take a seed and drop it in. That's it …We make such a big deal about gardening. Here it happens naturally…So their knowledge grows so much… The things we try to make obvious in other places – here it just happens. It's in their faces every day. I just feel they can have more connections.*

Teacher (Green Studies-K-5): *Two recent lesson plans…wouldn't have been possible [without the proximity of the natural world as it exists at Green School]…We were talking with the first graders about what is above and below ground and what happens below the ground, so that they start to develop an awareness of the life that that happens that you don't actually see. We walked five feet from the school and started digging up various vegetables – a carrot with the roots growing, a potato. Unless they were actually*

seeing it, holding it in their hand, I don't think that lesson would have had very much meaning to them. It wouldn't have left an impact. I don't think you can even put it into words how meaningful it is to be able to have a classroom garden and also to have a campus where there are all sort of things growing.

- **Many opportunities for field trips on campus**

A school field trip typically requires advance planning, making arrangements for transportation, worries about the weather and usually takes up most of a school day. At Green School, field trips can happen right on campus and be brief, spontaneous and natural events within any school day. "Instant" field trips can easily happen more than once. Repeating an experience anchors learning much better than isolated, non-contextual events do.

> Teacher (Pre-K): *This is what I love about Green School – the environment. It's open…I love the environment. We enjoy our morning walk together with the children to see the animals. It's like having your own field trip. Usually, when you go to international school, you need to go on a big field trip to find animals. But here we have our own. There are a lot of opportunities for us to feel connections, relations. Especially if you're talking about early education – it's really important for them to learn about senses. And this is the right place for them to be able to have experience smelling, seeing, touching.*

A teacher of older students described his plan to send two classes of middle school English students outside to work on a long-term writing project.

> Teacher (High school): *Now we're doing some classroom work…[but soon] they will be going out to the bridge to do a writing exercise that will take about two weeks. Just sitting outside on the bridge. The other class will be sitting out in a jungly kind of area wondering for a while before they do their writing.*

poetry workshop 617

- **Natural surroundings calming, soothing and peaceful**

A primary level teacher was certain that the natural vegetation that surrounds her classroom has a calming effect on her students.

> *I do feel that the color green is a soothing color. "Color therapy." Color is very therapeutic. You can use different colors to create what you want. If I have really wild children, this is a really good setting for them because green is a very calming color. It makes you feel at peace with yourself…I feel it's peaceful, calming here. Then you're peaceful, your mind is not in a thousand places. You can focus better.*

The influence of Green School's natural setting on students with learning challenges

student learning support building 6018

6019

- **Safe and comfortable for all kinds of learners**

Currently Green School employs two learning support teachers, one full-time and one part-time. When asked if there are additional charges for extra help, the learning support specialist replied,

> Learning Specialist: *I hope that will never happen. That might happen with a child who needs foreign language instruction, but not with a child who's dyslexic. I think it's really important for us to make a statement… If we start charging, that's the wrong statement. By not charging we're saying, "Yes, we support your child. That's just part of what we do." It's setting us apart on the island and in the region.*

A classroom teacher compared her experience in other schools teaching children with attention issues to her experience teaching Green School students who have attention issues.

Interviewer: *In your past teaching life, you must have had children with attention issues.*
Teacher (Older elementary): *Oh, yeah. [chuckling] I love teaching children like that because there are moments when you* ***get*** *them! [In my previous schools, I found teaching] those kinds of kids less challenging in a classroom…but once I was taking them on a trip out or taking them down to do an activity on the field or in the playground, that was when they would probably lose it. Or they were losing it on the playground at playtime and then when they came back in, it would impact into the classroom…[H]ere [at Green School], it doesn't happen so much. I've definitely got a number of kids with attention issues, but they don't come back from playtime jazzed up and they're ready to come back in and start learning again.*

- **Instruction in nature eases anxiety**

Some students enter Green School speaking little or no English. In one such case, there was a specific moment during an outdoor classroom activity when his teacher saw a student who had been intensely anxious for many days suddenly relax. She wondered if the natural setting he was in at that moment had made this possible

Teacher (Older elementary): *I had a little boy…last year join my class. He hardly had any English – minimal! For the whole first week his parents stayed around. He had stomachache. I think he was finding it so stressful. The moment that we had our breakthrough was out on a piece of wasteland in school. He was pointing at things in nature, an ant, a blade of grass. We were looking to see what was in the circle of nature. I could see. His shoulders went down. He relaxed. He was suddenly smiling at me. That was the moment when I knew he was going to be fine.*

Other teachers spoke of their belief that the openness of classrooms without walls has a positive effect on children with learning issues related to attention and/or hyperactivity.

Learning Specialist: *A child [in the environment of Green School] who normally can't maintain his energy, his energy isn't coming back to him. There's nowhere for that energy to go. If a child can't concentrate, what can he do? He's looking at the structure of the bamboo, looking outside, taking a break. Think about what that does for your soul, your brain, your whole state of being.*

Teacher (Primary): *We have children with ADD… but I think it's a very good environment for them because it gives them a lot to go out and do with their hands…When they're in a classroom, the walls are all closed, the door is closed, the AC is*

on, they don't know what to do. They're at the teacher's mercy. Here [at Green School] there are no walls or boundaries. The possibilities are limitless, endless. Your mind opens up. It's not looking at any walls. In my class I have at least four children who are special needs and I bet you can't tell.

- **Students with low confidence helped to appreciate themselves**

The openness of her Green School classroom was mentioned by a teacher as significantly helpful to a student who seemed to feel trapped by school and hopeless about ever learning to master specific skills. She believed that her classroom without walls was enabling him to begin to develop a sense of appreciation for himself.

> Teacher (Older elementary): *I think it [my classroom] feels bigger because it doesn't have any walls. Like for _____ who said, "Me and school, we don't match." Now here [at Green School] he's not got that kind of closed-in thing… I said to him the other day, "You're really good at English." He said, "**What?** You mean **me**?" And I said, "Yeah." He said, "But I can't do spelling!" I said, "It's not just about spelling and punctuation!" His **ideas** are valued.*

The influence of Green School's natural setting on teaching practice

- **A large variety of settings for teaching and learning**

Teachers of younger students spoke of how the proximity of the natural world, the generous amount of space surrounding the school and the feeling of openness of the Green School environment help make instruction more effective.

> Teacher (Older elementary): *We move around [in class]. The nature of the school means we move around a lot. I can move around a lot within the room. Here we have so many different learning areas that we can use. The bubble. The garden. We can go for a walk. That's what's really nice about the campus for teaching… [Mentions that her class is doing a global study of water this year.] We were reading about waterwheels, and we realized we could go have a look [at the vortex] and see which direction the water flows. In five minutes, we could move…, we could see it for real, everything clicked. That really helps! I've found in my teaching, especially in primary school, the more little things, the more stops and starts you have in any one lesson makes it so much better, the better the learning. You remember the beginning and the end. I think the campus just lends itself to that.*

• **Opportunities for creative teaching with ample space and nature all around**

Green School's location in nature means that teachers can design curriculum around the particular features of the natural world that are part of that location.

> Teacher (Older elementary): *I don't feel I teach any differently here from how I did before. But this environment makes what I do so much easier. Where I've been in schools before you had to do active learning (like drama) kind of behind closed doors. Having more space [to do] on-the-spot things – it's just* **here**. *When I'm planning, I feel like I'm much more open. I'm always thinking, "How am I going to do this outside?"*

CURRICULUM

How do place, space and environment influence the design and execution of curriculum and instruction at Green School?

Green School's website describes the school's curriculum as follows:
(See http://www.greenschool.org/curriculum/general-curriculum/)

> There are three main drivers to the Green School curriculum:
>
> - Essential academic subjects of English, Mathematics and Science – recognizing the importance of continuity and progression
> - Green Studies and Global Awareness – a hands-on study which evolves from Nature Study to Study of Ecology to Environment Studies to Studies of Sustainability
> - Creative Arts – embracing Art, Crafts, Music, Drama, Story-telling

Figure 7: **Three Drivers of Green School Curriculum**

(Drawing by Sheryl Erickson)

Academics

Green School's website describes the educational program used at the school in detail. Teachers of academic subjects – English, math and science – base their lessons and activities on the International General Certificate of Secondary Education (IGCSE) curriculum, which is currently used throughout the school. (Note: The IGCSE will soon be replaced with the International Baccalaureate program (IB).) In addition, there are specialist teachers for Green Studies and Global Awareness and Creative Arts who work with classroom teachers to integrate a broad range of possibilities for environmental study, visual arts, music and drama into the existing program at each grade level. These specialists have expertise in particular areas of study that they integrate into what classroom teachers are doing in their classrooms. They furnish teachers with relevant and developmentally appropriate ideas for experiences, activities, and materials for students that enrich and deepen classroom studies.

For example, for a whole school "International Day" event scheduled for the week the researchers departed, each class took responsibility for learning about one country and coming up with ways to share what they had learned with the rest of the school. Students were working on projects in class that involved knowledge of reading, writing, math and science content related to the country they were studying. They also were creating three-dimensional visual displays illustrating special features of the culture of each country. Project activities also included composing and rehearsing presentations that incorporated music, songs, dance, and drama into the finished product.

rehearsal for dance performance 0707

0713

Green Studies

What are "Green Studies" at Green School?

Green Studies and Global Awareness comprise "a hands-on study which evolves as students move up through the grades from younger to older" in the following developmental sequence:

Nature Study → Study of Ecology →Environmental Studies→ Studies of Sustainability

"Children are disconnected from the world outside their doors and connected with endangered animals and ecosystems around the globe through electronic media," writes David Sobel in *Beyond Ecophobia*. He goes on to say, "I propose that there are healthy ways to foster environmentally aware, empowered students…[by] supporting children's biological tendency to bond with the natural world."

> *How do we translate these notions into guidelines for environmental education? I propose three phases of environmental curricula during the elementary and middle school years. In early childhood, activities should center on enhancing the developmental tendency toward empathy with the natural world. In middle childhood, exploration should take precedence. And in early adolescence, social action should assume a more central role.* (Sobel, 1996)

The developmental sequence used in Green Studies work reflects just what Sobel proposes. The intent and purpose of Green Studies and Global Awareness at Green School is to connect students with the world beginning in preschool with nature study. In the early primary grades, children are introduced to the concept of ecology and the interconnections that exist between living things. Older students study the relationship between humans and nature, environmental studies with the goal of understanding and, ultimately, solving problems associated with sustainability.

> Andrew Dalton (Principal): *[Speaking about the Community Outreach program in which all Green School students participate] On Friday we [will] have three different groups joining us: disabled children, children from Changu International School doing a math collaboration, disadvantaged teens from Bali. The community service idea was started this year [with the idea that] every grade must have contact with some outside organization. Friday afternoons lessons stop and that's community outreach time.*

Other examples of projects include collecting plastic shopping bags and tetrapak drink containers and recycling them, helping out with animal welfare programs, such one dedicated to saving the Bali starling from extinction, the Orangutan Society and the Bali Bird Watching Society, working at a local hospital, fundraising for the "Smile" program, and removing trash from the banks of the river that flows through Green School's campus.

- **The importance of bonding with nature in childhood**

Children are born ready and eager for opportunities and experiences that bring them into contact with the natural world. For human beings to value the natural world in adulthood, David Sobel believes they must have many chances to connect with nature in childhood. Two Green Studies teachers who work as a team with students in the primary grades (Pre-K through 5) mentioned that reading Sobel's article on developmentally based instruction about nature strongly influenced their teaching

practice. One of them recalled experiences in nature during her childhood that had a tremendous influence on her.

> *One thing…about living in this place [faculty housing on the Green School campus] is, I don't know if I could be living in a place like this if I hadn't had the interactions I did with nature as a kid. My parents always took me camping. I was really outdoors. I grew this love for the outdoor world.*

- **Developmentally appropriate instruction**

Another central premise for Sobel is that learners can internalize instruction in a way that is deep and lasting only when ideas and concepts are presented in developmentally appropriate ways. Younger children need concrete experiences and opportunities that enable them to connect physically and imaginatively with the topics they are learning about. This is true for education about the natural world as much as for any other area of the curriculum. The primary level Green Studies teachers, interviewed together, spoke about it this way:

> *Unless you…have the kids imagine themselves, use their imaginations – be the bird, go fly like the bird – instead of just talking about how birds fly, [they won't learn much]. The whole thing is, if you want these people to grow up and be earth savers, they have to love the earth first. If they don't have that, they're not going to be environmentally conscious people… We have to teach to each age, knowing what are they capable of really taking from the lesson, really experiencing.*

They noted the freedom they have as teachers at Green School and how this freedom energizes their teaching. For example, they recalled the excitement for both their students and them when, on the spur of the moment, they were able to shift gears and pick some vegetables that they noticed were ready to harvest. A different lesson had originally been planned, but this job needed to be done more urgently.

> *There were all these bio-intensive beds that had to be planted. So with one of the classes we were going to plant seeds, but we noticed there were also an eggplant and other vegetables ready to be picked. We picked them and we marched all the way over to the kitchen across the river. We took a tour of the kitchen and gave them [the vegetables] to the head chef and she put them into the meal for the next day…We just walked in and said, "Here you go, Kadek," and she took her arms [and opened them up] like this and [the children] piled them in her arms. A beautiful vision!*

Delivering the vegetables on foot to the school kitchen after harvesting them added still another layer of meaning, purpose, and authenticity to the children's learning

experience, especially since they would be cooked and served at lunch in Heart of School. They concluded their interview this way:

> *What we see [as] our goal here [is] to create this bond with nature for kids, so that when they're older, they can really care about the environment…I think what we're doing here is so powerful if we instill them with this nature knowledge. We're not just opening books and saying, "That rain forest looks really nice." We're saying, "Look at this and then come out here and let's go play in it." Getting them immersed in that is opening all of these doors for their future and they don't even know it…That's what's magical about this place.*

How Green Studies facilitates integration across the curriculum

When asked if he thought place, space, and environment influence teaching and learning at Green School, the Green Studies /Environmental Management teacher for Grades 6-10 responded,

> *There's no doubt that it [Green School] is a nice place to come and learn, and parents on the whole say their children are very happy… If they're parents who've experienced what it's like when their child isn't happy at school…[and then] they see a change in their children's attitude toward school [at Green School] that would automatically have an effect on their learning.**

He went on to explain how his pedagogical frame of reference extends beyond the influence of place into education overall.

> *I don't think [what Green School is doing] is just a project in* ***environmental*** *education. It should be a project in* ***education****. As teachers, that's what our eyes are on,* ***should*** *be on [i.e. the field of education as a whole]…To me, the environmental thing is like the tool, the key, the way we're trying to change things…This isn't [just] a* ***green*** *thing, it's an* ***education*** *thing.*

The traditional model of universal public education in the U.S. no longer serves most students well, he said.

> *A lot of people talk about the fact that our education system is old. The whole purpose of it was to provide people for industrialization and it hasn't really changed, especially in England – same thing for 150 years. [At Green School] we're looking at how we can change that. How we can stop making them [students] all behave the same way, get to the same point, sit for the same exams.*

He explained how Green Studies can and is being used at Green School as a tool that allows teachers to integrate all areas of the curriculum. Serving as an overarching umbrella for curriculum, Green Studies provides a structure within which curricular connections can be made. It provides engaging, experience-based learning experiences that go beyond reading and writing at desks to connect to students' real lives.

[Green Studies]…becomes a space where we can make sure the links between all the curricula happen. That's one of the challenges in schools. Every teacher knows it's good to make the links, but it's really difficult to do it when every teacher's got their program and it has to be tested every year. So we have the freedom so that, [when] a good idea comes up, we go with that

stocking the fishpond 6058

mapping bamboo clumps 6232

* Unless otherwise indicated, all indented text in this section is the words of the Green Studies Teacher (Grades 6-10)

class planting rice (annual project) Green School Gallery

Like Brazilian educational philosopher, Paolo Freire, this teacher believes that teachers and students should work together as allies instead of in the conventional hierarchical relationship in which students are considered subordinate to teachers. Freire's philosophical proposition is "that a deep reciprocity [must] be inserted into notions of teacher and student." He [the Green Studies teacher] believes that Green Studies can function as a mechanism that can be used to promote student empowerment by creating opportunities for students to do meaningful work in the context of school.

> *We [teachers] have the freedom [at Green School] that, if a good idea comes up, we can go with that. And what that means is that if a good idea comes out of the students, we can follow that and we get to see the results of that and they [the students] do as well. They think, "Wow, I made that happen!"…Quite a powerful thing…starts to happen, especially with the older ones, something that would become a key thing with these students, a bit of a democratic move – that students can be listened to, that they can shape. The great thing is that I can let them do that.*

He noted that, because Green School is still a very young institution, its future is unpredictable. He compared Green School to Summerhill, the progressive school founded in Suffolk, England in 1921. Like Green School, Summerhill attracted much attention as an educational model, but did not touch off a lasting educational movement,.

> *There's not that many more Summerhills, are there? That's the question for me. Is it [Green School] just going to be one little school or is it going to be able to start something and join in with something bigger?*

He believes that one important way that Green School will achieve its mission – "empowering global citizens and green innovators who are inspired to take responsibility for the sustainability of the world" – is by teaching students how to grow food. Producing food locally will enable human beings to reduce their dependence on oil. Because the world's supply of oil is finite, future generations will need small-scale agricultural skills to provide them with food when long-distance shipping becomes no longer profitable.

> *All of the projects...[students] do on the school grounds, always behind that is the fact that we're teaching them how to do this bio-intensive farming, teaching the idea that we should try and live a lot more local, live off what we can produce locally ourselves, living a more sustainable life in our communities…[We're saying to students], "You're not just digging vegetables for the hell of it. You're doing it because you'll learn." And when they're older, hopefully they'll become leaders.*

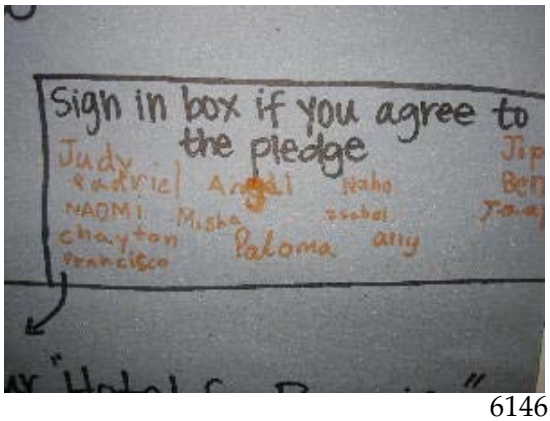

classroom garden work 6223

grade 3's class rice field 0731


setting up a worm composting bin 6215


grade 3 rabbit care project 6210

6145



6146

> *When they're designing their other gardens, we're talking to them about permaculture principles, about trying to make a small ecosystem that's sustainable, that many of the elements of the system have many functions. In the past we've… taken a plot of land that's there and made a garden. Here [at Green School] it's the center. We started with the garden.*

This instructional design and approach – specialist teachers working with several classes throughout the school year – has an additional advantage. Besides making learning activities come alive for students, it reduces redundancy in instruction. Redundancy occurs when teachers are working in isolation in separate classrooms and have little contact with colleagues. Less time spent repeating the same lesson means less chance of students being bored because they're already learned what's being taught. It also means that time is freed up to teach other things.

> *Three different teachers don't have to teach pie charts. We discovered by chance that by just sort of dropping things and looking at what's been dropped… "Oh, we* ***are*** *doing that." Or we're not, and someone will pick it up. It would take cooperation if you were to go to a traditional school and start it. That's why I've never seen it. It's too great a challenge. Unless the teachers were to take a month off and sit down with all their documents and properly blitz it, it's just a headache.*

How do teachers at Green School handle the logistics of planning integrated lessons with colleagues?

> *There's one teacher for each subject. We have conversations on the go… Just walking around… A lot of the teachers, if you approach them about what you're doing in Green Studies and want them to help you, as they should, they're very open to that and say, "OK." I think it's [workable] probably because there's one teacher per subject and it's a small school.*

The physical openness of the school's built environment allows teachers easier access to one another for purposes of designing and developing curriculum than is available to teachers who work in closed rooms off long corridors. The school's relatively small size also plays a part facilitates curriculum integration.

> *We're not looking at a program that has to cram so much into every week that we don't seem to have a week to be able to do something different. That's big. So we have Green Studies five lessons a week. Sometimes we'll do some really nice hands-on stuff. Sometimes we'll cover a bit of geography or science. Sometimes we'll put it aside and let them work on a project like the International Day that feeds into all subjects. So [Green Studies] becomes a space where we can make sure the links between all [areas of] the curriculum happen.*

Creative Arts

visual arts classroom 6197

International Day project 6237

making things for an International Day display about Italy 6236

What is "Creative Arts" at Green School?

Creative Arts, the third of the three drivers of Green School's educational program, is used to introduce students to and engage them in a rich array of visual arts, crafts, music, drama, and storytelling. The teachers of both visual and creative arts who were interviewed expressed a passionate conviction that arts – all subject areas, for that matter – should be taught contextually, never in isolation. They spoke also of their commitment to the idea that arts instruction is a vitally important and authentic way to preserve and transmit cultural knowledge between generations.

Creative Arts as a curriculum integration tool

Asked to comment on the influence of place, space and environment on the teaching and learning of Green School students, the visual arts teacher hesitated. Then he said, "Hm…That's a really difficult question for me. I don't have an exact answer." He went on to speak about his work prior to coming to Green School, founding and teaching arts for eighteen years at a rural school in Java. Ultimately, political unrest forced him to leave the island. When he learned about Green School's existence and visited it for the first time, he was tremendously excited.

> *I was really interested in working here. The first thing was the architecture. The second thing was the vision of the school. I…really like teaching and the kind of philosophy that is [concerned with] freedom of expression and environmental justice. That's why I was really interested in working here…When I saw this [Green School] the first time, I said, "Oh, wow! This could be the beginning!" I love working here. ***

** Unless otherwise indicated, all indented text in this section is the words of the Visual Arts teacher.

In his view, integrating arts across the entire curriculum enables students to achieve a deep knowledge and appreciation of other cultures. Simply asking students to reproduce an artifact from another culture and calling that a learning experience, he believes, is a meaningless exercise. Students must first learn about and understand what that artifact means and how it was or is used in its original cultural context.

> *[At my school in West Java] I used art as a medium, [an] educational medium, not only using the children's talents, but also…as a medium for teaching* ***anything*** *– other cultures, equality of culture, something like that. That's why now…[as] we start to integrate some subjects [at Green School]…I really want to know my…[colleagues']… perception about that and how to work together…how to perform. Visual art projects for me now are not only [about] teaching [students] to make something, but [about] go[ing] deeper.*
>
> *I accept subjects or themes from other [Green School] teachers, but the knowledge of the children about…[a particular] thing, for example, aboriginal art, Zulu art, Indian art – making things – I can't receive that. Without knowing the background of the culture, that's impossible. [Teachers say to me,] "Please make aboriginal art, please make this, please make that." I found out that the students didn't have knowledge about that culture at all.*

As an instance of curricular integration using arts, he described a long-term project he's developing at Green School that uses Javanese batik fabric as its starting point. Batik has been a Javanese textile art since the 5th or 6th century A. D. Traditional batiks were made with natural dye derived from the leaves of the indigo plant. Over time batik fabric came to be mass-produced and chemical-based dyes took the place of natural indigo. This study has sufficient breadth and depth to teach students not just about how traditional batik textiles were made, but allows them to move beyond into other curriculum areas like history, geography, botany, agriculture, sociology, economics, ecology, chemistry, and environmental studies.

> *For example, arts and Green Studies: For natural dye, we did a workshop here [at Green School]. I went back to my hometown [in Java] and I invited an expert from a very famous coastal batik town. A few of them are [still] doing natural dye. I picked one [expert], [invited him] here to Green School, did [a] workshop. [Laughing] Unfinished, of course! Maybe I need five or ten times workshop to transfer their knowledge! But…we planted the first indigo plant at Green School. The seeds came from Central Java. It [the indigo plants] grew and we're waiting. From this original Green School seed, with that seed, we can spread [indigo plants] across all of the school. This is just a pilot, very small, but I really,* ***really*** *like it!*

indigo plant growing on Green School campus 6337

This teacher is currently working to create an integrated arts curriculum document for Green School. His intention is to document in writing his ideas about how to integrate arts in a holistic way across the curriculum. His hope is that this will help other teachers to understand them and put them into practice. As he talked about this curriculum, he returned to the central question of this study: **How do you think place, space and environment influence the teaching and learning of students at Green School?**

> *In the context of the vision of this place [Green School], this place is really ideal because I can use anything here as a sample of creativity. Whereas if I imagine that I work in a concrete box…[leaves his sentence unfinished to convey how stark the contrast is]. When we talk about the creative process [at Green School] I [can] just create anything – Look at this! [stretching his arms outward into the space of his bamboo classroom] Look at this! Look up! To spark creativity in this building – it's really good.*
>
> *To make a knot – Look at the Balinese people, how many thousand knots…how to form 3-D work, how to make a dragon, a big, giant animal just using what we've got here. You should see the masks [that students in Grades 2-9 made]…I think the impact of this building architecturally…[Heart of School]…I think…student[s] easily can find really good examples [in it] as an alternative to their other, modern life. I think this building sparks their creativity. That's my assumption. This building has access [to creative inspiration]…They can use it! [It's a] totally different setting.*

He expressed doubt, however, that a holistic approach to teaching art – "to use art as a medium for teaching anything" – is fully understood at Green School.

This is the beginning of [the] integration that I experienced [at my former school]...There is no clear curriculum yet [at Green School]. Everything is partial. We are encouraged to work together, to integrate. That's why I call this time the beginning of integration… with all of the problems from the system, with the perception of teachers about that, about how to integrate, how to do holistic learning process here.

When asked to say more about his view that Green School teachers still have learning to do on the integration front, he insisted that he included himself in the group.

[Not just them] ***We!*** *Because I really want to know my friends' perception about that and how to work together and how to perform. Visual art projects for me now…[are] not only teaching [students] to make something, but [to] go deeper into the background [of a culture]. There is no system [at Green School]. There is no clear curriculum yet. Everything is partial, separate [in spite of the fact that] we are encouraged to work together, to integrate. That's why I call this time the beginning of integration.*

He concluded the interview by linking his vision of curricular integration to the educational program of Green School as a whole:

I really want to build up the curriculum, the Green School curriculum…[I want to develop a] more integrated, more holistic approach…[I]t's still far from my ideal, but that's the process.

ADMINISTRATOR INTERVIEWS

- **Green School's administrators**

Three of the four chief administrators of Green school were interviewed. The fourth was tape-recorded as he spoke to a group of parents of prospective students during a campus tour.

Consulting director Ronald Stones' career includes serving as CEO and Head of three international schools in Southeast Asia. He received an Order of the British Empire award (OBE) from Queen Elizabeth II for his lifelong service to education. He currently divides his time between directing Green School and consulting with international educators around the world.

Principal Andrew Dalton's prior experience includes teaching at several international schools and serving as the headmaster of an international school in Thailand. Andy and Ron were colleagues prior to coming to Green School.

General Manager Ajay Dalmia spent the previous twenty years doing techno-managerial work in business transformation and development, financial management, and thermal engineering. He is passionate about K-12 education and has volunteered for many years with Asha for Education. The mission of Asha is "to catalyze socio-economic change in India through education of underprivileged children."

Head of Admissions Ben McCrory, before coming to Green School, was a classroom teacher, an experiential educator, and also worked in admissions. His job is to inspire new families to enroll their children in the school.

- **Their roles and responsibilities**

Green School's administrators, like those of any school, are charged with maintaining and sustaining the health and well being of those who have come together around the school's mission and vision. It is the responsibility of the administrators to articulate the mission and vision effectively so that these ideas and values are understood and supported by the members of the school community. This leads, in turn, to the consumer satisfaction that is needed to draw additional people to join and support the community from year to year
In his individual interview each administrator communicated a deep sense of commitment to high quality education focused on teaching for sustainability. All seemed pleased and excited to have the opportunity to assist Green School in pioneering this new educational paradigm and to be participants in the effort to create an international school training students to become leaders in global sustainability.

- **"The Green School Effect"**

When Green School's Consulting Director was asked to explain the meaning of the term, Green School Effect, he responded in an email:

> *The effect of being at one with nature; of being surrounded by natural green vegetation all day; of breathing clean air; of eating healthy organic food without additives; of being in stunning architectural structures made of natural materials...The impact that all that has one the way that students learn, the relationships they enjoy, and their behavior.*

All administrators spoke with a combination of surprise and conviction about what they have observed to be the positive and healing effects of an educational context in which students and teachers are immersed in the natural world.

> Ron Stones: *I thought I understood how children learn, but... this is phenomenal, this project...I'm learning so much about the impact of being at one with nature in this learning process, on relationships, on behavior, on the way that people go about their business, on the focus that children can have on their work despite all these distractions. It's just amazing!*

All commented that Green School students, particularly those with past history of attention problems, appear better able to focus in Green School's open classrooms set in nature than students they had encountered in other learning environments where classrooms had walls and doors and were constructed out of concrete. Ron spoke about the way distractions are handled in Green School classrooms using this example:

> Ron: *When [a] dragonfly flies into the classroom, you [the teacher] have to say [to yourself], "That's a learning opportunity. Let's stop what we're doing, go with the flow, take this learning opportunity and then go back." And we [referring to both himself and the teacher of this classroom] both come from schools where that doesn't happen, regardless of the opportunity.*
>
> Teacher: *One of the biggest surprises for me working here is that…they [Green School students at work in the classroom] will just go, "Oh! There's that dragonfly again!" and then they get on with it.*
>
> Ron: *It becomes a natural distraction, doesn't it, an acceptable distraction. And when you think about it, if a child is easily distracted, if you put him into a box, he's going to look for distractions. Put him here, he doesn't need to look for distractions. They're all there. That blew my mind when I first came. That was against every principle that I thought. I thought, "Kids will* ***not*** *be able to concentrate." But [for instance] I've been in this classroom watching this [teacher] sit there telling a story and the kids are* ***inside*** *the story. It doesn't matter what's going on. They're inside the story! It's just magical to see it.*

- **Students who are learning and loving school**

Principal Andy Dalton said he couldn't explain scientifically what's responsible for the Green School Effect, but was certain that its students are happy at school and having fun. He believes that the school community as a whole – students, teachers, parents, administrators, and support staff – is generally happy as well.

> Andy: *The thing that none of us can put into words is this idea of what impact this environment is having on the children. One of the things I can confidently say is that it's not having a negative impact. It's certainly not regressing children's ability. It's either the same or helping it progress at a faster rate. The difficulty is measuring that. I'm a huge believer that people will only learn when they want to… That only takes place when they're happy. The emotional side must be right before the learning takes place, going back to Maslow's "Hierarchy of Needs" triangle. There are all the different conditions, aren't there? One of the things that really make me believe that learning is taking place [at this school] is that I see lots of happy children. If they're happy, then their minds are*

open and they're ready to take in new experiences. From a principal's point of view it's wonderful to see that. And I think the majority of the teachers are equally very happy – well, all of them really. I feel generally that's felt by most people. It's a really lovely place to be around.

General Manager Ajay Dalmia spoke as an administrator and also as the parent of two Green School students.

Ajay: *I think you…[will] hear from the parents of kids who come here and have been very fledgling in their attention spans [that they] have been able to focus better here. There's no research on it, so you don't know, but that's what you hear from parents…Last year I had spoken to many parents one on one…to get their feedback. [I asked them,] "How are they [their kids], enjoying [Green School?" and "What they are disliking about it?" I would say, for the most part, the parents felt that their kids were learning from the environment itself.*

What they were learning in the class was one thing, but they were [also] learning as they were walking around on the campus with all the plants, the animals, just walking in the nature. [Parents]…said [their children]…were just blossoming into an ability to think differently…When they plant the rice, they see it, they touch it, they feel it. So it is really about getting away from pure books, doing something that is all real. I think there is a lot more that can be done, that we could be doing here. At the same time I believe that there's some change that you can see in the kids.

[My own children] seem to be a lot more calm in terms of doing their work… [T]hey are more comfortable interacting with other kids. Since they see them around, they interact with them all the time, so it seems they are more comfortable doing that… I see them [as] more creative in terms of playing, in terms of coming up with things they can be involved with, because they see everything around them: the nature, they…draw, they invent games, make use of more materials than they would otherwise be throwing away. I would see that probably…[as the result of the influence] of the environment.

- **Academics at Green School**

Although the school is growing rapidly and appears to be thriving, it had a challenging beginning. Those interviewed who had been at Green School since it first opened spoke candidly about its initial disorganization. Once dissatisfaction set in, it grew to the point that a significant number of people in the community left. New students had to be enrolled to replace those who had left. New teachers had to be hired. Staff turnover was very high when the second school year began.

Ron Stones was invited to come to Green School to help get things back on track. He was highly regarded in Southeast Asia as an educational administrator with many years' experience, In his interview he said, "My first operating principle had to be that those who'd be buying into the [Green School] project…[must] know exactly what they were buying into. Everyone has ideas," he went on. "I have to be the ogre and say, "No. We'll do that next year. Put it in the considerations pot."

Parents base their expectations of what their children will learn at Green School on what they would be learning if they were enrolled in a traditional international school program. For this reason, Ron made the decision to adopt a standardized international curriculum to serve as one of the three "drivers" of Green School's educational program.

> Ron: *Green is very important to me, but academic rigor in English, maths and science – I'll hold onto that until I go to the grave. That has to be taught in a continuum from nursery all the way through, no matter where these students are going to go. They're going to need that. Let's do the green studies, the English, maths, science and the creative arts, and if we get the balance right in those, then fine… So grade 9 and grade 10 will take [the IGCSE] exams in June [2011] – optional exams. I want to see those results just to show that it's serious. It wasn't an easy thing to push through. We turned around much faster than I thought we would with people relocating from around the world to give their kids this Green School experience. That's the phenomenon.*
>
> *Although we'd lost some students [the first year], we had to lose others once we chose focus [i.e. adopting a standardized curriculum] because that focus would not fit what everyone was looking for. There'd be some that opted out. We had to do that bottoming out before we could start to do this because after we'd bottomed out, all those who'd buy into the project would know exactly what they were buying into.*

Putting the Cambridge IGCSE curriculum in place, Ron knew, would give Green School the credibility it needed to convince prospective families that their children would receive a "good education" if they enrolled them there. It would enable them to trust that they were buying an education that includes rigorous academics, and, at the same time, educates students within a new paradigm that puts global sustainability at the core of its program. Admissions Head, Ben McCrory, put it this way as he led a group of prospective parents around the campus.

> *"The day I arrived [at Green School], this bridge that we're standing on was the only structure that had been built at Green School. We are definitely a work in progress in many areas still. We've come a very long way in a very short time…We don't fit most fit most people's mental picture of what a school is supposed to look like. That said, we actually* **are** *a "real" school and students here learn reading and writing and math and*

science and we have a small but very beautiful library and computer lab…but with immersion in green and sustainability added.

- **Balancing structure and freedom**

Ajay Dalmia described the tensions within the school between which he, as chief financial officer, must mediate.

> *You have to have a balance. On the one hand, you have to run a school as a business…[that] has to be financially sustainable, and yet you have to innovate at the same time…You need to have the basics in place. And yet you need to have leading thinkers also who can push those boundaries...The question is, how much structure do you want and how much freedom do you give? I'm sure the answer's somewhere in between…I'm in administration. The question is money in the end. Sustainability [as an institution] can only come if our core product is strong and has a differentiation. So I need to influence decisions on the core product in order that the financials will be healthy.*

He expressed qualified approval of the decision to use the IGCSE because:

> *…it [gives] you something to hang your hat on. Otherwise you'd be all over the place. I think now we're at a point where that probably does make a lot of sense.*

FINDINGS Part III

Transferability of Place, Space and Environment to Settings Beyond Bali

John Hardy speaks to his vision of the first Green School serving as a "a seed" and "a model" for other green schools at the end of the video, "My Green School Dream." He proposes starting with the goal of creating fifty more green schools.

This is Green School number one. We built it as a seed, a model, for Bali and the world. We encourage you to copy it, to reinvent it, and to reproduce it. Just make sure you keep these simple rules in mind: be local, let your environment inform your decisions, and think about how your grandchildren might be influenced by your decisions. If you are interested in starting green school number two, we would love to hear from you

In the on-site interviews conducted for this study, the responses to the question, **Could you create a green school in Chicago?** ranged from skeptical to passionately affirmative. Even those who sounded initially skeptical seemed by the end of the

interview to have decided that many of the principles of sustainability that are being explored at Green School in Bali today can be put in place in any school setting. The limiting factors are the variables of geography, climate, resources and so on associated with each school's particular locale.

One newly arrived Green School parent was already thinking about changes she could make in her family's lifestyle in the direction of a more sustainable life style after they return home from Bali.

> *For generations we [people] were not even considering the impact of human beings on the planet. It's a completely new subject. Even I was never exposed to so many questions. It really makes me think, "How am I going to implement it when I go back?" We have a big house running on electricity.*

Another parent, on the other hand, said he could not easily imagine green schools in other parts of the world.

> *Climate is a challenge. Maybe you'd have to have glass walls everywhere.* (laughs) *You'd have to have some way of keeping the environment out!*

He was appreciative of what Green School was giving his children, but his primary concern was that their educations provide them with what he termed "choices" when they reach adulthood. He saw Green School as an educational enrichment opportunity to be followed by a return to more conventional schooling in the family's home country.

The transferability aspect of Green School's mission did not seem to be uppermost in the minds of some teachers.

> Teacher #1: *Hm. Really difficult [question]. Another school like this? Climate-wise…you couldn't take it to London. There are definitely elements you could do, [such as] the Green Studies program.*

> Teacher #2: *It would be cold in some places! (Chuckles, then considers a moment longer) I think you could. It would work anywhere if you had enough wild spaces around. There's got to be a bit of wilderness about it and a bit of discovery.*

Principal Andy Dalton mentioned school gardening programs as adaptable to any climate and environment.

> *My answer is, yes, you can [create a green school elsewhere], but you must look at your local environment to see which aspects of what we're doing here you can take and you can use. There are some things we're doing here every school can do. You can't create all this nature in every area, but a lot of the things we're doing – children being involved*

from the very beginning of growing, the rice cycle, that process ending up on the lunch plate – every school can do that. It could be anything, carrots, tomatoes, whatever it might be. It ends up back home. And [at school] the children know that today we are eating the lettuce that was grown by the kindergarten children. The kindergarten children feel fantastic about that!

One teacher grappled with this question with particular intensity. Aloud he asked himself the question, "What is Green School?" and then tried to answer it. From there he constructed in his mind an image of some of the key components he believes green school need to have.

> Teacher: *So what is Green School, then? Can we build structures out of bamboo in Chicago? No. I think you need some space, not much, but some. I think that [open space] has a big effect too. You don't feel this compression here, that there's nowhere to go, [like] "I need some quiet." Could you do this in a concrete building? A windowless building? It's a beautiful open space. Maybe it has a courtyard. So what else is Green School? [It should have a] heavy emphasis on the visual arts. What else is it? Is it just the fact that it's in Bali? There's something else going on here…What is it? I'm blinded. I can't imagine living anywhere else right now…It has to have a relaxed sense. It has to have a sense of community.*

The Green Studies teacher of older students said he believes that Green School needs time to vet its own program before it can serve as a model for other green schools. He hopes that the integrated design for curriculum and instruction that Green School is developing will ultimately be made available to and adopted by future green schools in other parts of the world.

> Green Studies Teacher (Grades 6-10): *We have to do this for a few years, get it right, know what we're doing. The people who built it up have to be like a consultancy to go and help make it work in other places. We're working on many fronts. [We've] got to know all about the local plants, build up a network. That's why our curriculum has to have the traditional subject knowledge that needs to be covered so the educational leaders can see that they're not losing out, and then it has to have a component that can be adapted to what's local in each place.*

The Green Studies teachers of younger children eagerly affirmed the idea that a green school can be made "anywhere where people really want it to happen," but added two caveats: 1) Teacher quality must be high to assure that instruction is excellent and 2) Schools must not let themselves become discouraged by difficulties and failures along the way because these will be inevitable. In their words,

[At Green School] we're trying to make something happen where the kids are really developing a connection with nature. Of course this can happen in inner cities – Chicago, New York – but it's going to require a lot more work, a lot more commitment and devotion on everyone's part, whereas here [in Bali] it just comes naturally. Just like any other place, it really depends on the teachers' influence. If you have good teachers showing the kids these influences, it's going to make it more powerful. I think this place [a green school] can happen anywhere where people really want it to happen. It takes the community to want it. It takes people…see[ing] how big an effect this is having. You just have to embrace it. I think the biggest thing that people kind of lose sight of is the importance of failure, because [Green School] has had a number of things that have failed. Especially when you're pioneering in new direction. You have to persist.

- **The "WOW" factor**

Another suggestion a teacher made was for green schools elsewhere in the world to create some sort of "trademark" structure like Green School's Heart of School building which is so unusual and beautiful that visitors are dazzled the first time they see it.

I think it is a real important factor to have the WOW! feeling. I think that, even if it was a different building [i.e. not a Heart of School], [it should]…still have a WOW! factor…[P]eople are inspired every day when they come in here [i.e. Heart of School].

INTERPRETATIONS AND COMMENTARY

PART I

Patterns in the Physical Environment

The distinctive physical environment at Green School is interwoven, to an unparalleled degree, with the school's mission and intentions. The importance of this connection should not be underestimated. It is a significant and provocative conclusion from this study.

One way to think about all of the observations about place is to propose them as nascent *patterns* (Alexander, 1977). Patterns are specific, recurring relationships in the physical environment that stand out and seem to make one feel more alive and human. In this form they have the potential be generalized and applied to other very different settings, on the assumption that the underlying structure of these patterns has universal

significance. A constellation of these distinctive features might have an influence on learning and teaching at Green School. There is some anecdotal evidence to support this.

1. Close to nature

Closeness to nature is the most outstanding and influential quality of Green School and the feature most often mentioned. In a way, it is a summation of all the other patterns that follow. Wherever you are at Green School – outside, in a classroom, in a changing room, on an upper floor – nature and artifacts from natural materials dominate your perceptions to an extraordinary extent. For example:

- The bamboo and grass building materials remain relatively visible in their native state, compared to, say, wood, stone, or plaster (which are also natural materials).
- Most of the material artifacts are hand crafted rather than manufactured and in a rough rather than a refined manner.
- Flooring is generally made of earth.
- With no walls, the light, sounds, weather and motion in the surrounding outdoors are always present.
- One goes outside to go from room to room.
- One can go in and out of a classroom at any point on its perimeter.

Ron Stones stated that the effect of this design on children is what he believes is the single most important contribution of Green School with respect to educating students for sustainability.

2. Outdoor paths between buildings

Going outside to get from room to room and especially the lack of enclosed corridor spaces is very relaxing. Corridors are inherently bad shapes (specifically discussed in Alexander's *Pattern Language*, 1977) – long, narrow, windowless and hard-surfaced. This is especially problematic in schools because corridors are the primary spaces where students socialize. Bullying happens in corridors, even though they are often policed. Members of the Green School community commented that there is little or no bullying at the school. The openness of its buildings may well explain why this is so.

At Green School, the paths between buildings are winding and somewhat private, with rain-tolerant but soft surfaces. The experience of walking along them is entirely different from walking down an interior corridor, or even a covered walkway. One is fully outside.

3. Natural light

There's almost no artificial light in use in Green School's buildings. Although the researchers didn't see Green School on a dark day, one teacher said that once little

skylights (plastic roofing) were added to the roof of her too-dark classroom, visibility inside it became sufficient with only natural light . Use of natural light is an additional way in which the difference between inside and outside is diminished. The inside spaces are used mostly during daylight hours.

classroom skylight 0726

4. Open edges

classroom edge 0768

The much-mentioned connection between the natural surroundings and the character of classroom space due to the lack of walls has many aspects: the presence of trees and other plants; the fresh breeze (perhaps the O_2 level is never reduced; heightened CO_2 levels apparently make one drowsy); sounds (see below); interesting things to watch; the sound and sight of rain. It appears from student comments that the gentle background of visual and aural "noise" helps you concentrate and calms you down. Several students specifically mentioned the fresh breeze which may be as valuable as the visual stimulation.

classroom interior 0727

Another aspect of open edges is the lack of doors or sharp transitions between spaces. Entering a traditional classroom is always a bit disruptive; it's a sudden social shift; everybody looks up. The person coming in is briefly the center of attention. This is true even if windows are added to soften the transition. Usually classroom doors are kept shut because there is noise from the hallway which has hard reverberant surfaces At Green School, a specific process in contrast to this was noted in the following vignette: Two students approached a class in session. As they came along the path, everyone could see them peripherally, and they could see the class. They slowed their pace and stopped talking to each other, composing themselves for the new social situation. The teacher addressed them briefly as they slipped off their shoes and came in under the roof, and then things settled down again. There was no sense of disruption. This was the pattern Entrance Transition well applied to the classroom situation.

Another example is the entrance to the pre-K classroom. To bring down the scale for the younger children and impart a sense of safety and specialness to the room, a child-sized entrance arch was built.

entrance to kindergarten classroom 0766

The building edge, rather than being a sharp boundary, is used as a storage zone which also softens the transition to the outside (cf the Thick Walls pattern).

kindergarten classroom (interior) 0762

5. Classrooms are buildings

Green School classrooms have a number of special qualities that arise from their design and the bamboo construction system.

- Free-standing individual structure
- Sheltering roof
- Arched ceiling
- Inspiring shape and details

Each classroom is impressive in its form, beautiful in its details, and unique in its structural patterns. What this communicates is that somebody really cared about this classroom; somebody takes this school and this class seriously – loves it in fact. One feels part of a collective project of great importance.

6. Variety of surfaces

The tactile realm is very rich: packed earth, a bamboo floor that gives under the feet (Heart of School), some mats, loose stones on the paths, mud brick steps. None of the surfaces are hard or sharp, and there's a lot of variety, which gives much tactile stimulation to the feet -- which are often bare, since shoes and sandals are left at classroom edges.

7. Connection to the earth

This pattern, very much in evidence, is well described in *A Pattern Language* (Alexander, 1977). It refers specifically to a sense of closeness to the ground, even when one is inside a building. Here it is accomplished by continuity of materials (earth floors, mud brick steps) and the lack of walls. The transition from inside to outside is simply several steps

down at the edges of rooms, just inside the roofline. In Green School buildings there is a feeling of being firmly anchored to the ground because the ground is so literally present.

By contrast, the upper floors and roofs, because they are made of bamboo that is both lightweight and flexible, do not feel at all like earth. They are more like tree houses, lightly built and moving in the wind. Perhaps the contrast makes both elements more powerful.

8. The quality of sound

Within a classroom, sound is gentle because the surfaces are not hard. However, they are enclosed enough so that conversation can be heard. One can hear sounds from other spaces, but these are somewhat muffled, so actual conversations can't be made out. One is aware of the presence of others, but not distracted by it. Also, there is a mixture of natural sounds with the manmade ones. There's an awareness of life and activity, without it being over-stimulating. That sharp brightness of masonry or plaster walls is missing, both from classrooms and from corridors.

9. Private, but not hidden

The openness of the buildings connects activities throughout the campus by both sight and sound. On the other hand, the spacing of buildings provides privacy for conversations and small group events. This interview, used elsewhere in this report, seems worth repeating because it sums up this pattern so well.

> *…because of the environment you know what's going on. You don't have to have appointments with the teachers. You just walk around the campus…It's the visibility. The classrooms are open.*

10. Natural materials and local construction

Green School's buildings and furnishings are a vast experiment in the use of bamboo as a building material. John and Cynthia Hardy embraced bamboo as a flexible, aesthetic, and ecologically sustainable product and have explored its possibilities. As successful entrepreneurs they were uniquely positioned to do this. They had already created a line of highly intricate silver jewelry based on traditional Balinese designs and a factory in Bali with 800 employees to produce it. They had experience, financial resources, a labor, and management network and the creativity necessary to take a traditional material and invent new ways to use it to produce an unusually marketable product on a large scale.

Bamboo is used extensively in Bali, but primarily for temporary structures because it decays after several years. The bamboo used by the Hardys for construction is treated with borax to extend its life. The bamboo factory is just across the river and was created specifically to produce everything that was needed to build the school. Such an

enterprise, with talented designers, an inexpensive labor force and freedom from building codes would be hard to imagine in most other settings today.

Buildings made with local materials are common in Bali. Like pre-industrial villages everywhere, the material culture is created out of what is available nearby and can be produced locally on a small scale. Whatever common material is in use locally, sooner or later you will see a small workshop along the roadside producing and selling it – grass roofing, bricks, carved stone, cement blocks, bamboo poles farming implements, crafts of all kinds. Numerous exceptions aside, the traditional fabric of local production in Bali is strong compared to that in industrialized countries. As a consequence, the sustainable Green School model of education fits in considerably more easily in the context of Bali than it would in the U.S.

11. Free form curved style

This is not a generalizable pattern, but a description of a style specific to Green School. The classrooms and other buildings have a strong resemblance to the traditional Balinese pavilion with some important differences.

- Non-rectilinear shapes: Balinese architecture is highly rectilinear, but Green School's buildings are free form, having almost no right angles or straight lines. Interlocking circles are the more common geometry. This may be a Steinerian influence or a carry-over from jewelry design, but there are good structural reasons for it as well

- Sweeping curves: Often compound (in two directions at once), these appear both in plan and in section, affecting both the layout of teaching spaces and the ceiling shape overhead.

- Basket-weave approach: The structure of the Balinese pavilion is usually quite simple – a few strong posts with minimal corner bracing, looking almost too slender to hold up the thick roof. In contrast, the Green School structures are made more like upside-down baskets, using many bamboo trunks and shapes that derive their strength from the curves and the crisscrossed parts that are almost woven together. The roofing itself is in the traditional Balinese style (thousands of ties holding *alang-alang* grass bundles to the purlins), but here the roof is curved rather than made of rectangular hipped planes.

Not surprisingly, the most difficult challenge in working with bamboo is the joints, since bamboo splits very easily once it is cut into. Holes, lashing, splicing, gluing and bolting are all in evidence. Although they have been checked by engineers, the joints aren't as satisfying, structurally and aesthetically, as other features of the structure. As with baskets, multiple elements or strands side by side work better than relying on single members or joints. Perpendicular joints are particularly challenging.

joints 0870

joints 0550

12. Open and Beautiful

The quality of buildings at Green School can be summarized quite simply with the same adjectives that appear many times in the interviews done for the study: open and beautiful.

The "open" part comes from imitating Balinese pavilions and sitting platforms, which don't have walls. Traditionally, walls enclose storerooms and kitchens, which tend to be dark and unpleasant (Wijaya, 2002). Government schools have borrowed building designs from northern-climate models, solid walls and occasional windows, rather than the Balinese equatorial-climate model where both households and temples are open compounds and work and social activities take place outdoors.

The "beautiful" part is harder to pinpoint. It seems to be a combination of a number of factors: designers and craftsmen with a strong aesthetic sense; use of natural materials; drawing from traditional roots but adapting to new techniques (a challenge); gifted visiting architects; and a strong guiding force (John Hardy) with both a big picture sense and an eye for details. In terms of method, a notable feature of the building process is that everyone, both designers and builders, works from models rather than plans. Measurements are taken directly from the models on the building site.

on-site model for taking building measurements 0702

"Awe-inspiring" must be added as a conscious intention at Green School – the WOW! factor" mentioned earlier. Cynthia Hardy suggested to the researchers,

> *See if you can get a tour of the jewelry factory before you…[leave Green School]. When you walk in, it's like a cathedral. That's what started John getting going on bamboo. That was his first really magnificent structure.*

13. Bamboo

John Hardy said that his inspiration to start building with bamboo came from Linda Garland, founder of the Environmental Bamboo Foundation in Ubud, Bali. (See http://www.bamboocentral.org/ for more information.) Because the bamboo construction system has an enormous influence on the quality of the school's buildings, it deserves a discussion all its own. Here is a list of descriptive features:

- Compare a bamboo pole to a milled piece of lumber, say a 4 x 4. The bamboo has a wholeness and beauty as an object in itself that the 4 x 4 can gain only by further working of it. The bamboo pole is still visually intact as a whole object. It has a bottom and a top and a design whose structural purpose is evident in the cylindrical shape, the cross-supporting nodes, and the tapering of the stalk. There is a continuity of scale, from very large (base) to very small (tip), and from whole plant (20 m long) to split strips for planks and flooring (2 cm across).

- Each building is made of hundreds, if not thousands of bamboo poles. Each pole is unique but similar, in the way that every leaf on a tree is unique but has the same identifiable shape. This gives the building the quality of a plant, combining general similarity with unique detail of each element. Because of the variability,

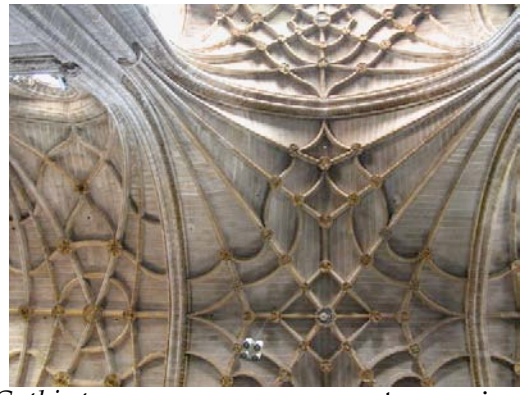
each pole must be selected for its suitable shape; rigid machine-like repetition is not possible. The feeling is organic – an overused term, but one that is accurate in this case.

- The various parts of bamboo are used in different ways to construct all the necessary construction components: structural poles, beams, flooring, railings, dividers and furniture. The idea might seem cute or doctrinaire, but isn't. The construction is done with such skill and inventiveness that it feels playful and delightful. The viewer's response is rather, "Wow! Someone had a great time playing with bamboo! Cross-sections of bamboo for balustrades!"

- Like most natural materials, bamboo is beautiful in its natural state; and for structural elements at least, it is being used directly in that state.

- Bamboo offers an ecologically viable alternative to timber for construction. Bamboo, like other grasses, grows very quickly. A structurally useful pole can be harvested in about 5 to 7 years. New shoots emerge from the same roots. Bamboo grows well in waste places such as steep riverbanks. If it can be protected against insects and decay by the borax bath process used at the Bamboo Pure factory, it is a highly sustainable building material.

- There is an interesting analogy to Gothic cathedrals evident in Green School's structures. The columns become thinner and fewer as they rise up, spreading out into the roof. The stone of European buildings was worked to create this visually uplifting impression. Bamboo takes this form naturally when bundles of poles are used as columns. In Heart of School, for instance, some poles in the bundle support lower floors and some keep going to the roof.



Gothic tracery tracery.jpg

ceiling of Heart of School 0619

- It's relatively difficult to make walls from bamboo, and impossible to make soundproof walls. The lack of solid walls, except in some private separate buildings, is a hallmark of Green School and has many specific consequences mentioned elsewhere, such as free flow of air, natural light, quality of sound, connectedness of all the spaces.

In general, this system of building with bamboo has a light, airy, spontaneous quality that is truly delightful. On the other hand, it also can strike the viewer as flimsy, especially one with a cold-climate eye accustomed to roofs that must carry the weight of snow and walls that must be well insulated. For children, the fanciful is certainly more exciting and liberating, a relief from the substantial, traditional architecture of most schools.

14. Designing and building are one process

Ron Stones summarized the building process at Green School as follows:

> Ron: *The way that the school was conceived is from artists. The artist's design, John Hardy's team of jewelry makers, were the first ones who designed all the structures, all the buildings. So you see, they're not restricted by architectural conventions. They're free. So then the artist hands his drawing to a model maker, the artisan model maker, who then makes it work. We then invite the structural engineer to come and comment on the model. He will add, subtract. We then hand the model to the contractor and say, 'Please construct from this model.'*
> Interviewer: *Has the engineer drawn up plans?*
> Ron: *Nope. Not at this stage. So, when the building is complete, then we say to the architect, 'Would you make a drawing of this building so we can apply for permission to build?' So the architect has a place, but at the end. And you get structures like this as a result!*

villa under construction 0689

Unlike the modern industrial production process where design has been taken away from the producer, the traditional building process is much more integrated in terms of people, places, and skills. The designer of a traditional building is usually the master craftsman of the primary material. In Europe the mason (stone), was central and in America it was the carpenter (wood). In the case of Green School, the craftsmen were John Hardy's jewelry makers. In this tradition, the amount of drawing done on paper is the minimum needed to make decisions at the appropriate scale, and transition to working with the thing itself – either the site or the material – is made as soon as possible, so that designing and building happen as one process. Either the designer and builder are one and the same person or they work in a close collaborative relationship.

By contrast, in the typical industrial model, the architect/engineer and the builder/craftsman have fundamentally antagonistic relationships. Many authors (Ruskin, 1849; Morris, 1884; Marx, various writings; Alexander, 1977; Braverman, 1974) have written about the importance of this difference in terms of worker self-respect, human dignity, the spiritual and aesthetic qualities of the product and the experience of its production.

The bamboo construction used at Green School takes the integration of the construction process to great lengths. In fact, it would be impossible to imagine these buildings being made in any other way. It resembles a speeded-up movie version of building a cathedral using bamboo and grass instead of stone and lead and the time required for construction is three months instead of 100 years.

- A rough geometry is developed on paper.
- A model using sticks is imposed on the paper design and a foam site plan.
- The layout of floors, the structure, and the pattern of joints are worked out with the sticks. The design is complex in three dimensions, so drawings are impossible.
- Site planning begins with a purification ceremony.
- The scattered footings are dug by hand.
- Workers measure directly from the model to get dimensions and select the bamboo poles to fit the lengths and curves of the model.
- Joints are fitted and shaped by hand in place.
- There is continuity from the larger to the smaller details.
- Design decisions are made continuously throughout the construction process. Details are altered based on how they feel once they are in place. This is possible partly because the materials are relatively inexpensive and the design can be revised quickly.

- The design is emergent, arising from direct perception of the building and its details as they are made.

15. Hand-crafted construction details.

The designers who develop the Hardy's building projects rarely make any false steps, as far as the researcher could tell. Part of the reason for this is that the Hardys themselves have craft-based design experience. (See quote from Ron Stones above.). Another reason is that labor is very inexpensive. It is possible to make:

- a bamboo foot perfectly fitted to an irregular stone so that it looks "organic."
- unique bamboo stalks, each chosen and placed so that the natural curvature fits the plan.
- a flowing stairway by shaping and fitting many pieces of bamboo together.
- baked mud paver steps winding up a hillside; complex and irregular roof edges.
- hand-carved stone wash basins.
- adjustments if a detail doesn't look right.

What influence does this wealth of hand crafted details have on the building's occupants, in this case, Green School's students, teachers, staff, parents and visitors? Christopher Alexander (Alexander, 2001) would say the space is more alive and thus makes them feel more alive. There are other ways of putting it: awareness of someone's attention to detail and respect for the integrity and organic origin of the materials which the children then naturally share and a human, non-industrial quality to every built object which the children are asked to emulate in their own work. The message of each object is that a living, thinking, skilled person made this using materials whose origins are known and near at hand. The process is sustainable, both in a material and a human sense. It feels close to the educational process.

16. Impermanence

Impermanence may not seem like a virtue in buildings, but it may be a central reason why Green School is both inspiring and humanizing. There is a sense at Green School that everything is in the process of just being made. Buildings go up fast. New buildings are being added. If a wild idea – a mud-wrestling pond, another classroom, a giant crystal, a tipi, a new rabbit hutch or an indigo-growing experiment – comes along, it just appears before you know it. Everything is experimental. If something doesn't work, it can be adapted to make it better.

The buildings and the curriculum are being invented alongside each other, guided by a common sense of purpose that is shared by the community: building, teaching, and

learning for a sustainable future. In the language of David Orr, the school provides an environment where "the ecology of imagination and ecological attachment can flourish." (From *Loving our Children,* David Orr)

Any building process is electrifying as an expression of creativity and possibility, and it has even more power in the context of an intentional community. The message, reinforced by the dynamism of the buildings, is that the school and everyone in it are engaged in something new, exciting, and important. The washed-out bridge can be seen as an unexpected opportunity for renewal of Green School's vision.

John Hardy, in a videotaped talk about bamboo delivered to the Association of Siamese Architects indicates that he doesn't care about permanence of buildings. "Anyone who thinks his buildings will last is deluding himself." It isn't clear how long the main structural bamboo will last, but other parts are known to be temporary. For instance, the vast *alang-alang* roofs of Heart of School will last about eight years. The school grounds require constant maintenance because of frequent rain and rapid growth of vegetation. All this suggests that there is a good chance that the school will retain its feeling of impermanence into the future.

Figure 7: **Enablers of Teaching and Learning**

Summary of Key Features from Findings:
Patterns and qualities of the physical environment and the experiences of students, staff and parents of Green School

PHYSICAL ENVIRONMENT (observational data)	**EDUCATIONAL ENVIRONMENT** (student and parent data)	**EDUCATIONAL ENVIRONMENT** (teacher and staff data)
Close to nature	Sense of freedom	Opportunities for innovation and creativity
Outdoor paths between buildings	No pressure	Close connection between indoors and outdoors
Natural light	Intimacy with the natural world	Authentic experience with the real world
Open edges	Encouragement to be yourself	Flexibility and spontaneity
Almost every classroom is a detached structure	Real world experiences	Children asked to take responsibility
Variety of surfaces	Aesthetic learning environment	Calming and soothing natural surroundings
Connection to the earth	Transparency and informality	Safe and comfortable for all kinds of learners
Qualities of sound	Sense of belonging	Unique strengths valued and celebrated
Private, but not hidden	High value placed upon community	Students allowed to be physically active
Natural materials and local construction	First hand experience with natural systems	Large variety of teaching and learning settings
Free-form curved style	Daily and ongoing connection with natural world	Excitement about learning and teaching
Open and beautiful	School feels supportive and nurturing	Integrated curriculum focused on sustainability and systems thinking
Bamboo	Safe and comfortable	Balanced educational program (academics, Green Studies, Creative Arts)
Design and building are one process	Proud of school	Developmentally appropriate instruction
Handcrafted construction details	Happy students having fun	Importance of bonding with nature in childhood is recognized
Impermanence	Students and parents love the school	Teachers and staff love the school

INTERPRETATIONS AND COMMENTARY

PART II

Place and Community

1. CONVERGING FACTORS

When asked if a green school could be put in Chicago, Cynthia Hardy said,

> *All it is, is money, land, and intention…Your intention and intuition will take you to the right place .*

Can money, land, and intention alone bring into being something as big, complex and potentially influential as Green School? In fact, a number of other factors besides money, land and intention can be identified that contributed in vital ways to make it possible for John Hardy's "Green School dream" to become a reality.

- **Vision, energy and resources**

Most important were the contributions of Green School's founders. John and Cynthia Hardy are very intelligent, visionary people who bring passion, caring, imagination, love, and humor to everything they do. Their personal energy is magnetic. Everyone in Bali seems to know them or know about them, and everyone is interested in what they're doing. One article paints an especially vivid picture of them. "Spending time with [John] Hardy," its author writes, "is like learning to dream: the farfetched suddenly seems possible. He speaks in a never-ending stream of ideas."

Nothing the Hardys do seems ordinary. Their jewelry is elegant. The small hotel they built out of Javanese teak wood bridal homes, moved from Java and reconstructed on land next to the house in which they live is beautifully appointed and managed. Their own home is a stunning example of architectural design of the highest quality. All of these projects embody the "WOW!" factor and are dramatic examples of their commitment to making everything that they create and do beautiful.

- **Mission: Educating for Sustainability**

Another component of the overall convergence of factors that resulted in the creation of Green School was Al Gore's film, *An Inconvenient Truth*. It convinced the Hardys that using their money to promote sustainability was the most important thing they could do at this point in their lives and careers. In a 2006 interview John Hardy said,

Sustainability is the future. The path we're on is clearly not the path of sustainability. There's plenty of everything, except in the presence of extreme greed. We need to realize that the sustainable future is the future of sharing…[this] plenty.

In 2006 the Hardys invented the term "sustainable luxury" to promote sustainable practices in business. The jewelry company launched a project to "offset the greenhouse gas emissions associated with all its print advertising campaigns and business travels that they called "sustainable advertising." The idea behind this was that businesses can and should compensate nature for the resources they consume.

At that time the economic situation in Indonesia became so grave that many Indonesians were unable to afford adequate food. Using organic farming methods, the Hardys grew vegetables on the land around the jewelry factory in order to ensure that their employees had enough to eat.

In 2007 the Hardys sold the jewelry business and dedicated the money from the sale to founding a school with sustainability as the focus, core, and "spine" of its educational program and institutional operation. Their long time residence and business experience both in Bali and internationally put them in a perfect position to be the founders of such a school.

- **Two-tiered economy**

Producing their jewelry in the developing world and marketing it the west gave the Hardys a significant economic advantage. By the same token, services at Green School, which would be prohibitively expensive in an industrialized country, are affordable in the economy of Southeast Asia. For example, in Bali handcrafted construction, maintenance activities and on-site food preparation cost a fraction of what they would in the developed world. The school can retain a large support staff, including an office support staff and a technology team, full-time security guards, custodians who clean the buildings and toilets and eight gardeners who tend the vegetable gardens on campus. Tuition at Green School for international families – about $10,000 per year – is relatively low compared to U.S. private school tuitions. Green School families can live in Bali and afford household help, childcare and a driver at little expense by western standards.

- **Bamboo**

John Hardy became increasingly interested in bamboo at this time in his life. Bamboo, indigenous to Indonesia, is a strong and fast-growing renewable building material. For many years he had employed local craftsmen and applied traditional skills and designs to innovative situations. The idea of creating a school that would be dedicated to educating students for sustainability gave him an opportunity to undertake a full-scale experiment in bamboo construction. The experiment resulted in the special physical qualities of place, space and environment at Green School that are a focus of this study.

- **Natural environment of Bali**

Again, circumstances were extraordinarily favorable in terms of climate and geography for a school whose mission is to develop leaders in global sustainability. Bali is located eight degrees south of the equator. Rice is the staple element in the Balinese diet and three rice crops a year are grown along with a wide variety of vegetables and fruits. The landscape of the island as a whole is still primarily agrarian. Currently, the Balinese now buy more food than they grow themselves. Farming knowledge and skills are no longer being passed on to the current generation of Balinese children as a matter of course. Learning how to produce food locally would be a central element in a curriculum focused on issues of sustainability. Teaching students these skills could be done easily on the 20 acres of rural land the Hardys chose as the site for the school.

- **Cultural and social environment of Bali**

Over the last 30 years Bali has become a more and more attractive destination for western tourists and the growth of tourism as an industry there has had a significant positive effect on the Balinese economy. Another fortunate thing for the Hardys and their work is the unusually open attitude the Balinese people take towards foreigners. That they might feel resentment towards an ever-increasing number of international visitors would not be surprising, yet one does not feel any. A westerner who is a permanent resident of Bali said:

> *Bali is…a particularly easy place for western people. There's so much gentleness and kindness with the people who live here. They're very welcoming.*

An Internet tourist guide describes the island's appeal this way:

> *There is the combination of the friendly people, the natural attractions, the great variety of things to see and do, the year-round pleasant climate, and the absence of security problems. And then there is Bali's special "magic" which is difficult to explain. As soon as you step off the plane you might sense the difference. In the villages you'll notice the quietness and wisdom in old people's faces, and the interest and respect in the young's. Old men sit at the roadside caressing their fighting cocks. Beautifully dressed women walk proudly through rice fields and forests carrying offerings on their heads to the next temple. There is the smell of flowers, and in the distance you hear the sound of gamelan music.*

These qualities make Bali particularly appealing to parents searching for an educational enrichment experience for their children. As mentioned earlier, the families of one third of the current student population of Green School have relocated to Bali in order to send their children to the school.

2. 2. CURRICULAR INTEGRATION

- **Active learning embedded in place**

From the outset Green School has sought and captured considerable attention around the world as a pioneering experiment in education. The mystique conjured up by the film, "South Pacific," seems to have been long-lasting. Just hearing the word "Bali" seems to make people sit up and take notice. The idea of a school in Bali that focuses on educating students for sustainability has a similarly electrifying effect. Most publicity about Green School to date has focused on its dramatic architecture and innovative mission, but has not described the educational program in much depth.

Green School uses a cross-curricular instructional design. The school's guiding principles * for this interdisciplinary instructional approach to curriculum are:

1) learning by doing
2) place-based learning
3) systems learning
4) interdisciplinary, theme-based learning
5) collaborative learning
6) project-based learning

Teachers engage in active and ongoing collaboration with one another to find ways to help students make connections across subject areas. Learning opportunities for students involve active engagement in authentic experiences in the real world. If all teachers approached curriculum and instruction the way Green School teachers do, perhaps the disaffected, "badly behaved" students who spend their childhoods feeling imprisoned in school would be transformed into engaged learners who enjoy school and care about the world and its future.

- **Complexity embraced**

Complexity has emerged as a dominant aspect of life in the 21st century. Green School appears to be an educational institution comfortable with complexity in a way that most schools are not. The cross-curricular integration that Green School is attempting to build into its educational program makes it possible for teachers to teach to children's individual strengths and also challenge them to think about what they are learning in complex ways. The Green School community is a gathering of people, both staff and families, who are willing to face the reality of complexity, a critical factor for success in educating leaders in sustainability.

Learning about and understanding sustainability requires learning about and understanding complex problems and how to use systems-oriented thinking to solve them. Systems thinking is way of understanding interdependencies, feedback and causal connections within in the larger context of interconnected systems. Teaching

* From an unpublished Green School document

students how to think in systems-oriented ways is challenging. Teaching in a literal, superficial way is easier than using experiential activities to communicate what we want students to learn. But lessons that involve exclusively literal level thinking and verbal explanations rather than hands-on experiences and isolate students from a meaningful context leave them confused or, worse, having learned little or nothing. To produce truly educated adults, we must recognize complexity as an essential component in the process of education and make it central to within the process of education.

Acknowledging and embracing complexity is essential to educating well. After visiting Green Village, a residential housing development currently under construction by the Hardys near the Green School campus, the researcher noted a similarity between bamboo construction and Green School's approach to education.

> *Looking at these bamboo houses, they're so piece-by-piece. Everything about building with bamboo is that you're just adding another piece, another strip. When you're building with that kind of material, you have to be completely in touch with the nature of the material and the shape of that particular pole of bamboo. We [in the U.S.] think you can just go to Home Depot, buy the whole thing already made and snap it together — a few screws and you've got it. That's a little epiphany for me, seeing the intricacy of the building material as analogous to the way Green School is teaching.*

Just as the process of designing and building one of the bamboo villas is complex, the process of education also requires ample time, attention to detail and careful craftsmanship. Educating children as if they were cookie cutter houses in a development thrown up overnight simply to turn a quick profit does not produce a well made, beautiful or durable result. Green School approaches each child in the same way that the craftsmen building the houses of Green Village do – as something unique and individual to be helped to realize its potential through the use of love and care.

- **A paradigm shift for education**

Green School's pedagogical position is that curriculum integration, done well, makes it possible to teach sustainable thinking in a way that is holistic, meaningful, and academically rigorous. Green School faculty members are currently working to produce written curriculum guides for Green Studies and Creative Arts that describe this integrated instructional approach and methodology. The school plans to make these guides available to other schools around the world in future.

The Hardys invested a large amount of money in building a school because they believed that educating the upcoming generation of children was the most direct and effective way to change the paradigm that now governs human beings' habits and patterns of consumption. This paradigm can be changed only if and when people love the earth that surrounds them. We need to educate students to recognize and understand that the earth is the only place where life can exist. Its well being must

become the concern of enough of the people who are alive today to ensure that those who come next will have a habitable world to live in. If the health of the earth is to be sustained, the issue of sustainability must move from behind the scenes to center stage. Devising ways to solve environmental problems and promote sustainability must be raised to the level where these ways are understood as the most important and urgent imperatives of our time.

- **A place-based focus for learning**

Locating a school in a spectacularly beautiful and unspoiled natural setting and basing curriculum and instruction on that setting is place-based education on a grand scale. By making all instruction place-based and shining the spotlight squarely on the issue of sustainability, Green School guides students to focus their attention and intellect on the place where they are living and learn in depth about what goes on there. A place-based lens helps students, teachers and the school community as a whole to get to know one place in an ongoing and intimate way. The more you know about something, the more likely you are to have positive feelings of attachment to and affection for it. This applies to both relationships with people and relationships with places.

3. PLACE AS A CONTAINER FOR COMMUNITY

As mentioned earlier, in this study, "place" is understood to have three meanings. Green School can serve as an example for each.

1) Places exist physically in the natural world:
   The Green School campus was formerly a large piece of undeveloped land with beautiful natural features.

2) Places come into being both naturally and in the form of spaces and structures built by human beings:
   Green School's buildings are architecturally elegant and exciting to look at and to be in.

3) Places can take a less tangible form as communities of people who have gathered together around an idea such as culture, religion, or values:
   Green School is a human community in both a social and an abstract sense.

Green School is a place that contains a human community of shared values. It is a concrete representation of a set of abstract ideas. It is the realization of the hopes and dreams of people who, before they discovered that Green School existed and decided to join its community, were deeply troubled about the materialistic, high stress, unsustainable world in which they were living and raising their children. Green School offers an alternative, a physical place that invites others to join in to employ collective imagination and creativity in the service of positive action against unsustainable living.

The cause of the future well being of our children – of all the world's children – needs to be taken up as a matter of the greatest concern. It's difficult to argue against a school

whose mission is to help ensure that the earth will be saved for future generations. To create a container in the shape of a school in which a vision and mission can be carried out is brilliant in its simplicity.

- **Green School as a model for future green schools**

Green School also exists in the imagination and hearts of those who feel a connection with the vision and mission of the school. This is true of both people who are physically part of the community and those who are following its development from a distance or passing through. That Green School is located in a beautiful and unspoiled natural setting place is fortunate. People from other parts of the world seek out Bali for its beauty and charm. In addition, Southeast Asia has a large international community of people who would be likely to be interested in sending their children to an unconventional international school with a global vision and mission. Green School *is* that school. Its name alone is emblematic of something powerful and compelling. A school that calls itself "green" signifies a curriculum that focuses on what is needed to make sustainable living possible in a world where climate conditions appear to changing for the worse and resources are diminishing.

- **Creating a vital community in a school whose students come and go**

It's paradoxical that a school whose educational program is all about connection to place depends principally, with the exception of local Balinese students on scholarship, on the international community for both enrollment and faculty. Green School's community, at least for now, is largely transient.

> Andy Dalton (Principal): *We offer this wonderful opportunity for children to come on a trial for one day to see if they like the school. We do accept children for a few weeks. While we're still a growing school and finances are tight, if you can get some income, you do say yes. I wouldn't see that continuing always. I'm not sure it's a good thing. I think the teachers understand the reasoning behind it, but I think they'd greatly prefer that it didn't happen.*
> Interviewer: *But somehow students are integrated it?*
> Andy: *They fit in straight away.*

This teacher, when asked if this feature of the school was problematic for her, seemed more resigned than resentful.

> Teacher: *You just go with it. I think you just have to. It makes it interesting as well. The children are from all over the world. It's such a mixed bunch.*

Parents appreciate that their children can come to Green School for a limited amount of time without an expectation that they should stay long enough to graduate.

Parent: *I stopped working last year. We were in this turning point and we could give it a go. Give them a life experience, but not as a permanent thing. We have a home in ___ that we're desperate to make home. We want our children to have roots [there]. We don't want our children to be like third culture children who don't know where to start. We want them to be global citizens, but have roots in [their home country].*

Green School is chosen by many international families to be a short-term educational enrichment opportunity for their child or children. One parent, who relocated to Bali years before Green School opened, feels especially sure that it is the right place for her and her children since Green School came into existence and is an educational option for them.

Parent: *When I came here, I knew it was the place for me, my family, my beliefs…For me, Bali is home. I'm excited to get back. It feels good to get back to Bali… All I know is that when I see my kids in this community and I come to things here, [it feels right]. Adults [in this community] love seeing each other. It's very real, down to earth. It's not cliquey, exclusive. [There are] people from everywhere. There's that common thread of the environmental or future thinking.*

Whether you are a student, parent, faculty or staff member at Green School or even a visitor just passing through, you are welcomed into the community. You feel it when you arrived at the entrance gate and the Balinese security guard greets you warmly. As you walk down the path towards Heart of School, you pass a community notice board. Just beyond is the *warung* where anyone can buy delicious, but inexpensive home-cooked food all day from early morning until late in the afternoon.

Parents sit on benches there and socialize or work on laptops. Balinese staff are behind a bamboo counter, ready to take orders. A parent described the warmth she experiences from these food staff members: "If you want an egg sunny side up, you'll get it. ____ [names one of the servers] stands there with love and attention giving everybody what they want."

warung 6356

Good food available at all hours goes a long way towards making the members of any community feel safe and welcome, including Green School's. This sense is reinforced at lunch. Steaming earthenware bowls of freshly cooked local Balinese dishes are carried from the kitchen across the river and set up buffet-style on the ground floor of Heart of School. You can buy this for lunch or bring your lunch from home. Everyone finds a spot to sit, eat and socialize. After eating, students play together in Heart of School or go outside to run around on the soccer field or chat together until classes resume in the afternoon.

setting up for lunch 6129

playing in Heart of School after lunch 0949

Teacher: [Green School] *is communal. I love it that parents are here, tourists, kids are all here together. At lunch a child will come and set up shop at the table where teachers are sitting. Those boundaries are gone.*

This sort of community is what people seem to be yearning for in an era when community feels hard to find. Green School demonstrates not only that genuine community is possible to create, but also that it can happen even when member turnover is frequent. When a community comes together around sufficiently powerful and shared values, people can come and go without damaging the integrity and overall strength of the community.

- **In conclusion**

What is the influence of place, space, and environment on teaching and learning of students at Green School? The data collected for this study supports the conclusion that education rooted in place has a positive influence on the experience of Green School students – but not only students. This influence appears to be far reaching, to pervade the entire school community – students, teachers, parents, administrators, support staff, even visitors – and to touch everyone who spends time there. One teacher said, "I believe this place has a tremendous power to heal."

Educators elsewhere in the world need to know about Green School and then look closely at what is going there. We need to understand what is behind "The Green School Effect" so that we can it happen in our own schools, wherever in the world they are, before it's too late.

There is a better vision for education and the life of the mind
that is rooted in place. The starting point is a thorough understanding
of a natural history of place in education and a clearheaded sense of
the reciprocal and intimate relationship between head, hands, heart, and place.

--David Orr

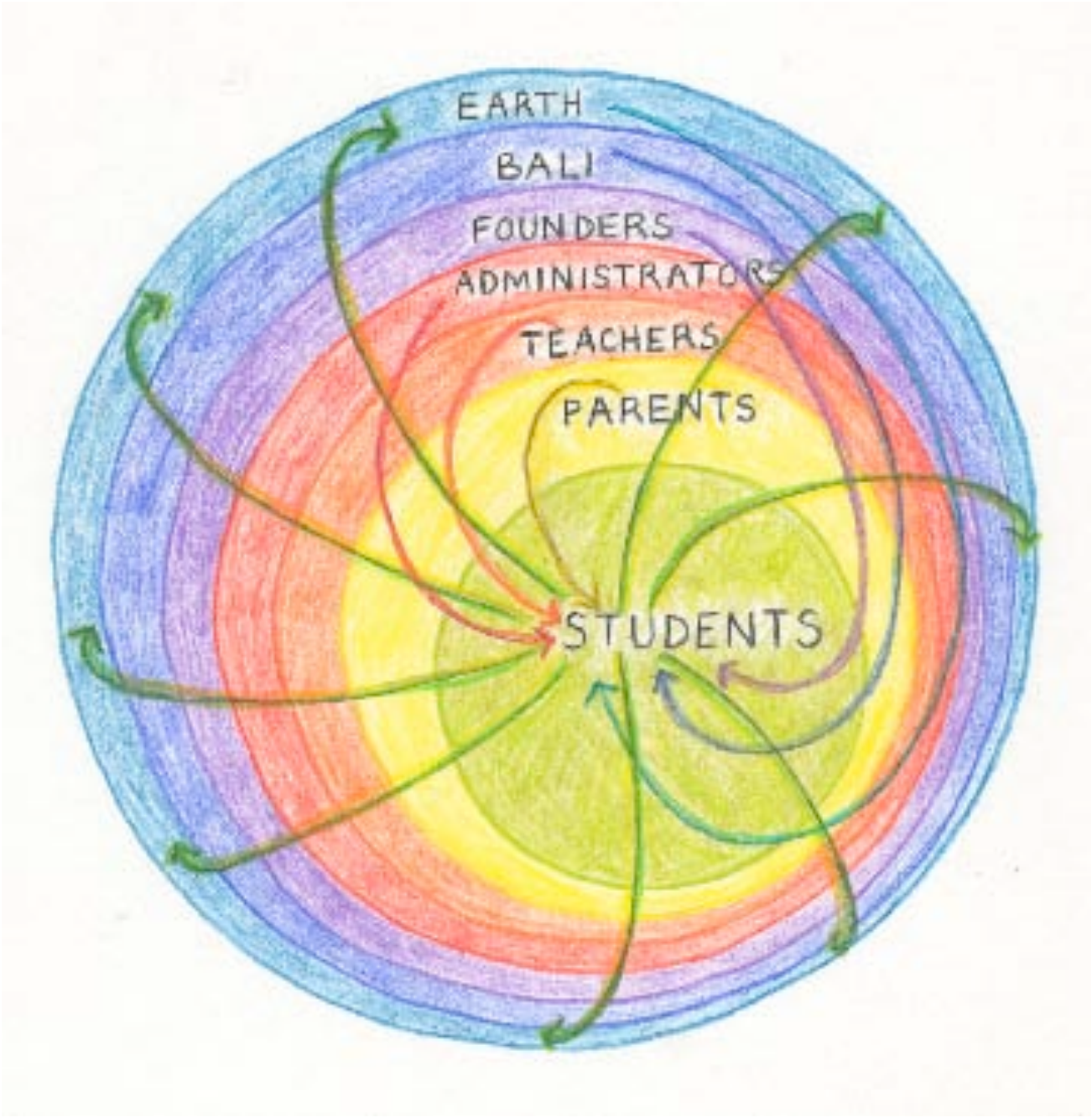


Figure 8: **Green School as a Community of Caretakers**

GROUP	DESIRES /GOALS
Students	**I want to:** feel good about myself. feel safe and have fun at school. have friends. have good relationships with my teachers.
Parents	**We want our child to:** enjoy school. spend lots of time outdoors. learn to love the natural world. learn about how to live sustainably. respect and value all people and cultures.
Teachers	**I want to work in a school setting that:** teaches the whole child. uses developmentally appropriate learning activities. uses a place-based, systems-oriented approach to teaching and learning. encourages its faculty to teach creatively. educates students for a sustainable future.
Administrators	**I want to:** educate and inspire students to be leaders in global sustainability. achieve / maintain long-term sustainability for the school. provide a model for green schools around the world.
Founders	**We want to:** educate and inspire students to be leaders in global sustainability. achieve / maintain long-term sustainability for the school. provide a model for 50 more green schools around the world. leave a school that educates for sustainability as our legacy.
Bali	**We who live in Bali want:** economic, cultural and ecological sustainability for Bali.
Earth	**We who live on earth want:** economic, cultural and ecological sustainability for all people and well-being for all living things.

Figure 9: **The Green School Community Nested in a World Community**

APPENDIX A

Questions for Further Inquiry and Research

More about Green School:

Who actually designed Green School? What were/are distinctive features of the design process? Ways of thinking about the built environment that included sensitivity to teaching/learning/relationship?

How does the Green School environment reduce stress and create a sense of freedom?

In what ways are Green School students with learning challenges impacted by specific qualities in the environment and the setting in which they are educated?

What is the cost of this kind of green education, assuming inventiveness and resourcefulness are essential factors in sustaining a green school?

What factors have contributed to Green School's increase in enrollment as rapidly (from 100 to 230) in just two and a half years' time?

What other significantly influential elements - in addition to place, space, and environment - are contributing to Green School's pervasively positive climate for teaching and learning?

What are alternative ways to measure outcomes and progress in learning at Green School? With its transient population of students? Given its priorities of rigorous academic achievement and deep connection and lifelong relationship with Nature?

Green School and Other Schools:

What is a green school? What are some of the variations and hybrid forms?

Is the education that Green School offers different from that offered by other international schools or just packaged in a new and exciting way?

How are other schools in the world with missions similar to Green School's carrying them out?

What are the ingredients essential to launch, evolve and sustain a green school? Minimum requisites? Ideal but not necessary? Necessary but not sufficient?

Pedagogy and Educational Approach:

What are key or critical factors in developing future adult leaders for sustainability with a global perspective?

What is a theory or perspectives of how learning and teaching are influenced by place, space, and surroundings and vice versa?

Is there a developmental sequence around awareness of the environment and sense of connection with the environment? If so what does it look like?

What, if any, is the benefit of viewing stewardship of a school as "a work in progress" with expectation and valuing of emerging forms? What are the hazards of an emergent approach?

Green School is a work in progress—learning by making, and honoring emergence, creating from design consciousness related to practicality and use. How does emergence happen in a newly created school? Long established school? What does emergence look like in each of these settings? What skills are needed to discern which kinds of emergence deserve enhancement and amplification and which can be let go?

Education for Sustainability:

What are effective age-appropriate actions (age appropriate from youngest children to the elderly) for sustainability that includes increased consciousness and awareness of environment?

How do increasing awareness and hands-on engagement with the environment lead to actions to protect and nurture the environment? What are catalysts and enhancers?

How do cultural and spiritual beliefs and norms of people local to a school relate to current public opinion and thinking/action for sustainability? Where is there resonance and dissonance? What can be learned from the indigenous peoples?

What might "green colleges" and "green universities" look like?

What parallels can be identified between a green college and a green primary and secondary school in terms of how to educate leaders for sustainability?

Systems Thinking:

How does systems thinking change one's view and approach to sustainability and the impact of schools in general?

How does systems thinking alter our view of how to use our resources and act for sustainability in ways that have optimal impact and long term viability through institutions of education?

APPENDIX B

The Cultural Setting of Bali

The natural setting of Bali, the special qualities of the Balinese as a people, and the Hindu religious beliefs that are so much a part of daily life captivate visitors who have come to Bali from the developed world.

Bali, Indonesia - as a remote island - has been able to retain most of its indigenous culture, traditions, and religious practices relatively intact. In her study of the underpinnings of Balinese indigenous culture, Renee Levi (2010) identified a number of principles that relate to this current research. These principles are reinforced and validated by this study's findings.

- *Being of service* – to something larger than oneself, including to the earth
- *Being in community* – self as a collective self acting on behalf of the whole
- *Being in relationship* – welcoming, wanting to please and valuing of appreciation
- *Being in place* – as source of identity and extension of self; land considered alive
- *Being in attunement* - knowing and discernment in seen and unseen worlds
- *Being in beauty* - beauty as a gateway to the divine; creation of beauty everywhere

Of particular relevance in setting the context for this study is Levi's identification of the principle of "Being in Place." (The other principles also echo repeatedly through this study's observations, voices of the people interviewed, and reflections.)

> *Place provides identity, but more than that it is an extension of the self that incorporates home and temples, village, nature and landforms and topography of the island. Land is considered to be alive and inhabited by island gods. Family and village temples are sited based on direction and proximity to landforms considered holy, especially Mount Agung, a volcanic mountain in central Bali.*

Ecology for the Balinese is a natural part of their traditions, religion, and way of life:

> *Ecology for the Balinese is an expression of harmony , respect and love for the environment. There are ceremonies dedicated to plants and animals…including prayers… of appreciation for what plants and animals give humans and commitments to sustainability of the natural world.*

Levi describes a Balinese architect who "walks the land" to gain a sense of place:

> *… before he begins his plans for a home, office building or other structure, he visits the land on which these are to be built to experience the "sense of the place". He stands on the land, alone and notices from which direction the wind blows, how the light shifts during the day, what smells and sounds pervade the place, and where neighbors are. In*

this sense he 'listens' to the place. "It is also common in Bali," he says, "to ask for the land's permission to build and to provide offerings to the deities of the place."

In interviews of parents and teachers, there was a clear theme of the positive qualities unique to the Balinese people: pleasant, welcoming, kind, gentle, in tune with what is around them, caring of each other and loving children.

Parent: *The people of Bali are just so wonderful…[In leading spiritual retreats on Bali for the past 13 years] the thing we would hear most would be about the people of Bali, how wonderful they are, soft, gentle, smiling, basically happy. I think Bali is one of the most balanced places on earth, on the planet.*

Teacher: *If you really get to know the people of the Balinese culture, they're absolutely beautiful people. They're very intentional. You can see them almost every night doing a ceremony. They're just really in tune with what's around them…If you show them you care about them, they'll give you the world. I feel safe here. They live their lives on karma. They're so nice. They're not going to harm you because they're worried about the next life. Since we've been here, we've felt so safe.*

Teacher: *We can't replicate Balinese people. We're surrounded by some of the most tranquil people on the planet. They're never in a hurry.*

Interviewer: *[People say] that there's this energy in Bali…*

Teacher: *There is. There's no doubt about it. Bali will bring [it] to the surface…it gets to you…there's something about this place. You're surrounded by people who have such faith, too, all this Hindu belief and you've got all this entrepreneurial spirit here. I really do think you could do anything that you set your mind to here.*

Parent: *The karmic culture of Bali is so kind! And they love kids. The men scoop your kid up. My six-year-old doesn't even think that anyone's different.*

APPENDIX C

Glossary

bale: at Green School a small sitting platform for parents; about 3 x 3 meters in size; similar structures are common as gathering places in villages throughout Bali

Bamboo Pure Factory: on-site factory that produced and fabricated all of the bamboo for Green School; it is continuing to produce structural bamboo, other buildings, and a line of bamboo furniture

Bamboo Village*:* houses and living quarters for staff of Green School

ecology: a science that studies mutual relationships between an organism and its environment

eco-psychology: one of the branches of psychology. The word "psycho-" means related to soul; spiritual

enablers: conditions or qualities that enhance, empower or make possible

environment: something that surrounds; all of the conditions that surround and influence life on earth, including atmospheric conditions, food chains, and the water cycle. Emphasis in this study is on physical environment.

green: in environmental terms, the practice of using methods that contribute to the health of this planet we all share called Earth. Green living incorporates conservation into our daily life, whether it be through consuming less non-renewable energy, recycling reusable materials, or eating less meat.

Green Camp: outreach program that Green School offers children from neighborhood schools an eight-week-long program on sustainability; the round and yurt-like buildings that are used for this program

green school: Green schools prepare students to become leaders and citizens who understand how the natural world works, see the patterns that connect human activity to nature, and have the knowledge, values, and skills to act effectively on that understanding. Green schools contribute to making communities more sustainable, explore solutions to environmental problems, and serve as models of responsible action.

Green School Effect: The effect of being at one with nature; of being surrounded by natural green vegetation all day; of breathing clean air; of eating healthy organic food without additives; of being in stunning architectural structures made of natural materials. The impact that all that has on the way that students learn, the relationships they enjoy, and their behavior. (Ron Stone)

green studies: a hands-on developmental sequence of study at Green School which evolves from Nature Studies to Study of Ecology to Environmental Studies to Studies of Sustainability

holistic education: an educational approach based on the premise that each person finds identity, meaning, and purpose in life through connections to the community, to the natural world, and to spiritual values such as compassion and peace. Holistic education aims to call forth from people an intrinsic reverence for life and a passionate love of learning. This is done through direct engagement with the environment.

IB: International Baccalaureate program. Curriculum for standardized exams soon to replace IGCSE at Green School**.**

IGCSE: Referred to as the "Cambridge exams." International General Certificate of Secondary Education. A standard curriculum for academic subjects – English, math and science – which is currently used throughout Green school. (Note: The IGCSE will soon be replaced with the International Baccalaureate program, or IB.)

indigo: plant from which natural dyes can be made

mepantigan: theatre or dramatics hall at Green School

nascent patterns: specific recurring relationships in the physical environment that seem to stand out and have a strong positive effect (Alexander, 1977); "nascent" means coming into being, emergent

place (considered in conjunction with **space** and **environment**): 1. nature and natural settings 2. built or man-made environments 3. human communities

sustainability: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987; Moore, 1995).

Waldorf education: a humanistic approach to pedagogy based upon the educational philosophy of the Austrian philosopher Rudolf Steiner. Learning is interdisciplinary, integrating practical, artistic, and conceptual elements. The approach emphasizes the role of the imagination in learning, developing thinking that includes a creative as well as an analytic component. The educational philosophy's overarching goals are to provide young people the basis on which to develop into free, morally responsible, and integrated individuals.

warung: open café; at Green School also a gathering place for parents, staff and children

APPENDIX D

References

Alexander, Christopher; Ishikawa, Sara; and Silverstein, Murray with Jacobson, Max; Fiksdahl-King, Ingrid; and Shlomo, Ange. *Pattern Language.* New York: Oxford University Press, 1977.

Alexander, Christopher; Davis, Howard;Martinez, Julio and Corner, Don. *The Production of Houses*. New York: Oxford University Press, 1983.

Arendt, Hannah. *The Human Condition.* Chicago: The University of Chicago Press, 1958.

Baker, Molly and Knapp, Cliff. "Special Focus on Place-Based Education." *The Journal of Experiential Education.* Vol. 27, No. 3, pp. 265-2005, 2005.

Ballantyne, Rou and Packer, Jan. "Introducing a Fifth Pedagogy: Experience-Based Strategies for Facilitating Learning in Natural Environments." *Environmental Education Research*. Vol. 15, No. 2, April 2009: pp 243-62.

Bortoft, H. *The Wholeness of Nature: Goethe's Way Toward a Science of Conscious Participation in Nature*. Hudson, NY: Lindesfarne, 1996.

Braverman, Harry. *Labor and Monopoly Capital: The Degradation of Work in the 20th Century.* New York: Monthly Review Press, 1974.

Broda, Herbert W. *Schoolyard-Enhanced Learning: Using the Outdoors as an Instructional Tool, K-8*. Portland, ME: Stenhouse Publishers, 2007.

Callejo-Perez, David M; Slater, Judith J.; and Fain, Stephen M. *Pedagogy of Place: Seeing Space as Cultural Education.* New York: P. Lang, 2004.

Casey, Edward S. *Getting Back into Place: Toward a Renewed Understanding of the Place-World*. Bloomington: Indiana University Press, 1993.

Chawla, Louise. "Ecstatic Places" New York: A List of Bibliographic References.

Chawla, Louise. *In the First Country of Place: Nature, Poetry and Childhood Memory*. Albany, New York: SUNY Press, 1994.

Chawla, Louise. "Retrospective: Environmental Education Research: A Decade Later," *Children, Youth and Environments*, Vol. 18, No. 2, 2008.

Chawla, Louise. *Review of Literature on Children & Environment*: Overview 1993. With review of literature as update ten years later.

Cook. L. *Developing a Sense of Place. Examining Educator Practice in Place-Based Education.* Ph.D. diss., Prescott College, 2009.

Cooper, Marcus C. "Designing for a Commitment to Place: Lessons from the Alternative Community, Findhorn." In. *Dwelling, Seeing and Designing: Toward a Phenomenological Ecology,* edited by David Seamon, pp. 247-69. Albany, New York: SUNY Press, 1993:.

Crede, Janice Lynn. *Nature Immersion: A Model of Sustainability Education*. Ph.D. diss., Prescott College, 2009.

Davison, Julian. *Introduction to Balinese Architecture.* Singapore: Periplus Editions, 2003.

Dovey, K. "Putting Geometry in its Place: Toward a Phenomenology of the Design Process." In *Dwelling, Seeing and Designing: Toward a Phenomenological Ecology*, edited by David Seamon. Albany New: SUNY Press, 1995.

Eiseman, Fred B., Jr. *Bali: Sekala and Niskala: Essays on Religion, Ritual and Art*, Volume I, Singapore: Periplus Editions, 1990.

Eiseman, Fred B., Jr. *Bali: Sekala and Niskala: Essays on Society, Tradition and Craft*, Volume II, Singapore: Periplus Editions, 1990.

Friere, Paulo. *Education for Critical Consciousness*. New York: Continuum Publishers, 1992.

Flowers, Andrea Lee. *Experiential Environmental Education: An Exploration of Grade Eight Students' Environmental Attitudes, Behaviors and Emotions*. M.E.S. Dalhousie University, Halifax, Nova Scotia. 2007.

Foran, Andrew. *Teaching Outside the School: A Phenomenological Inquiry*. Ph.D. diss., University of Alberta, 2006.

Green School Staff. *Handbook for Families 2009-2010*. The Green School, 2009.

Gruenewald, David A. "The Best of Both Worlds: A Critical Pedagogy of Place." *Environmental Education Research*, Vol. 14, No. 3, American Education Research Association. June 2008: pp. 308-24.

Gruenewald, David A. and Smith, Gregory A. *Place-Based Education in the Global Age: Local Diversity*. New York: Lawrence Eribaum Associates, 2008.

Harries, K. "Thoughts on Non-Arbitrary Architecture." In *Dwelling, Seeing and Designing: Toward a Phenomenological Ecology*, edited by David Seamon, pp 331-54). Albany, New York: SUNY Press, 1993.

Hodge, Stacey L. *Outdoor Learning Environments: Evaluating Need, Success and Sustainability.* M.L.A. diss., The University of Texas at Arlington, 2004.

Hoffman, Paul J. "Making the Change to Sustainability: Building Green Builds a Better Education." *Techniques: Connecting Education and Careers*, Vol. 84, No. 3, April 2009: pp. 16-21.

Hutchinson, David. *A Natural History of Place in Education.* New York: Teachers' College Press. 2004.

Ingram, William. *A Little Bit One O'Clock*, Ubud, Bali, Indonesia: Ersania Books, 1998.

Jennings, Nancy; Swidler, Steve; and Koliba, Christopher. "Place-Based Education in the Standards-Based Reform Era – Conflict or Complement?" *American Journal of Education*, Vol. 112, No. 1, November 2005: p 44.

Knapp, Clifford E. "The I-Thou Relationship: Place-Based Education and Aldo Leopold." *Journal of Experiential Education*, Vol. 27, No. 3, 2005: pp 277-85.

Lansing, J. Stephen, *The Balinese: Case Studies in Cultural Anthropology*. New York: Harcourt Brace and Co., 1995.

Learie, Sharman, *Changing Lives Creating Leaders: Transformational Environmental Education*. M.A. thesis. Victoria, British Columbia. Royal Roads University, Canada, 2009.

Levi, Renee. *The Green School Research Proposal*. The Powers of Place Initiative. May 25, 2010.

Levi, Renee. Living Leadership: Lessons from the Balinese . The Powers of Place Initiative, 2010. (Internet report)

Levi, Renee, *The Powers of Place: An Inquiry into the Influence of Place, Space and Environment on Collective Transformation.* The Powers of Place Initiative, 2008. (Internet report)

Lippman, Peter C. "Can the Physical Environment Have an Impact on the Learning Environment?" *CELE Exchange*, Article 13, Nov. 2010.

Litz, K. *Inspiring Environmental Stewardship: Developing a Sense of Place, Critical Thinking Skills and Ecoliteracy to Establish an Environmental Ethic of Care*. Ph.D, diss., Prescott College, 2010.

Lugg, Alison. "Developing Sustainability-Literate Citizens through Outdoor Learning: Possibility for Outdoor Education in Higher Education." *Journal of Adventure Education and Outdoor Learning,* Vol. 7, No. 2, December 2007: pp 97-112.

Margadant-van Archen, M. "Nature Experience of 8-12 year-old Children." *Phenomenology + Pedagogy*, 8, 1990: 86-94.

McPhee, Colin, *A House in Bali*. Singapore: Periplus Editions, 1944.

Morris, William. "How We Live and How We Might Live" See A.L. Morton, ed., *Political Writings of William Morris*, London: Lawrence and Wishart Ltd. 1884.

Nabhan, Gary and Trimble, Stephen, *The Geography of Childhood: Why Children Need Wild Places.* Boston: Beacon Press. 1994.

Nespor, Jan. "Education and Place: A Review Essay." *Educational Theory*, Vol. 58, No. 4, 2008: pp. 475-89.

Orr, David. *The Nature of Design: Ecology, Culture and Human Intention*. New York: Oxford University Press, 2002.

Reeves, James Leyman. *A Qualitative Study of a Walk with Nature: An Outdoor Environmental Experiential Education Program.* Ed D. diss., University of Georgia, 1993.

Ruskin, John. *The Seven Lamps of Architecture*. Mineola, New York: Dover Books. 1989.

Saracino, P. *Place-Based Pedagogy in the Era of Accountability: An Action Research Study*. Ph.D. diss., University of Rochester, 2010.

Seamon, David. "A Way of Seeing People and Place: Phenomenology of Environment-Behavior Research." In *Theoretical Perspectives in Environment-Behavior Research*, edited by Wapner, Seymour; Demik, Jack; Tamanoto, Takiji and Minami, Hiroufmi. Norwell, MA: Kluwer Academic Publishers. 2000.

Seamon, David. "Humanistic and Phenomenological Advances in Environmental Design." *Humanistic Psychology*, 17, 1989: pp 280-93.

Seamon, David."The Phenomenological Contribution to Environmental Psychology." *Journal of Environmental Psychology*, Vol. 2, 1982: 119-140.

Seamon, David. ed. *Dwelling, Seeing and Designing: Toward a Phenomenological Ecology.* Albany, NY: SUNY Press, 1993.

Semken, Steven and Freeman, Carol Butler. "Sense of Place in the Practice and Assessment of Place-Based Science Teaching." *Science Education*, Vol. 92, No. 6, November 2008: pp. 1042-57.

Senge, Peter. *The Fifth Discipline*. New York: Doubleday, 1990.

Sipos, Yona; Battisti, Bryce; and Grimm, Kurt. "Achieving Transformative Sustainability Learning: Engaging Head, Hands and Heart." *International Journal of Sustainability in High Education*, Vol. 9, No. 1, 2008, pp. 68-86.

Smith, Gregory A. "Place-Based Education: Breaking Through the Constraining Regularities of Public School." *Environmental Education Research*. Vol. 13, No. 2, April, 2007: pp 189-207.

Sobel, David. *Beyond Ecophobia: Reclaiming the Heart of Nature Education*. Great Barrington, MA: Orion Society Nature of Literacy Series, 1996.

Sobel, David. *Childhood and Nature: Design Principles for Education*. Portland, ME: Stenhouse Publishers, 2008.

Sobel, David. *Childrens' Special Places: Exploring the Role of Forts, Dens, and Bush Houses in Middle Childhood.* Tucson, AZ: Zephyr Press, 1993.

Sobel, David. *Place-Based Education: Connecting Classrooms and Communities*. Great Barrington, MA: Orion Society. 2005.

Tuan, Yi-Fu. *Space and Place: The Perspective of Experience.* Minneapolis, MN: University of Minnesota Press, 1977.

Tuan, Yi-Fu. *Topophilia: A Study of Environmental Perception, Attitude and Values*. New York: Columbia University Press, 1974.

von Eckhartsburg, R. "Introducing Existential-Phenomenological Psychology." In *Phenomenological Inquiry into Psychology,* edited by R. Valle, pp 3-20. New York: Plenum, 1998.

Wijaya, Made. *Architecture of Bali.* Singapore: Editions Didier Millet, 2002.

Wither, Sarah E. *Local Curriculum Development and Place-Based Education*. Ph.D. diss., University of Denver, 2000.

Zube, E. ed. "The Phenomenological Contribution to Environmental Psychology." In *Theoretical Perspectives on Environmental Behavior Research* New York: Plenum, 2000: (pp 157-78).

Resources for Further Reading and Inquiry:

Abrams, D. *The Spell of the Sensuous*. New York: Pantheon, 1996.

Alexander, Christopher. *The Nature of Order: An Essay on the Art of Building and the Nature of the Universe*. New York: Oxford University Press, 2001.

Bachelard, Gaston. *The Poetics of Space: The Classic Look at How We Experience Intimate Places.* Barrington, MA: The Orion Press, 1964.

Goudie, Andrew. *The Human Impact: Man's Role in Environmental Change*. Cambridge: MIT Press, 1982.

Howett, C. "If the Doors of Perception were Cleansed: Toward an Experiential Aesthetics for the Designed Landscape." In *Dwelling, Seeing and Designing: Toward a*

Phenomenological Ecology, edited by David Seamon, pp 331-54) Albany, New York: SUNY Press, 1993.

Leopold, Aldo. *For the Health of the Land*. Washington, DC: Island Press, 1999.

Louv, Richard. *Last Child in the Woods: Saving our Children from Nature Deficit Disorder.* Chapel Hill, NC: Algonquin Books, 2008.

MacGregor, Catriona. *Partnering with Nature: The Wild Path to Reconnecting with the Earth*. Hillsboro, Oregon: Beyond Words, 2010.

Metzner, Ralph. *Green Psychology: Transforming Our Relationship to the Earth*. Rochester, VT: Park Street Press, 1999.

Moore, Robin "Childrens' Gardening: First Steps Towards a Sustainable Future." *Children, Youth and Environments Journal* 12(2), June 1995.

Saunders, S. "Place-Based Education: Its Time Has Come." *Michigan Citizen*, Vol. 32, No. 31, June 2010.

Schafer, R. Murray. *The Soundscape: Tuning the World.* New York: Knopf, 1977.

Seamon, David and Mugerauer, Robert, eds. *Dwelling, Place and Environment: Towards a Phenomenology of Person and World*. Malabar, FL: Krieger Publishing, 2000.

Seamon, David, and Zajonc Arthur, *Goethe's Way of Science: Toward a Phenomenology of Nature*. Albany, New York: SUNY Press, 1998.

Somerville, Margaret. "A Place Pedagogy for 'Global Contemporarity.'" *Educational Philosophy & Theory*. Vol. 42, No. 3, April 2010: pp 326-44.

Stefanoic, I.L. "Evolving Sustainability: A Re-Thinking of Ontological Foundations." *Trumpeter*, 8, 1991: pp. 194-200.

Stone, Michael K. and Barlow, Zenobia. eds. *Ecological Literacy: Educating Our Children for a Sustainable World*. San Francisco: Sierra Club Books, 2005.

Walker, Leslie Clare; Tallmadge, John and Wessels, Tom. *Into the Field: A Guide to Locally Focused Teaching*. Barrington, MA: The Orion Society, 2008.

APPENDIX E

Pre-Research Survey

[Survey emailed by Head of Green School to all parents prior to research visit.]

The purpose of this survey is to gather information about our community in preparation for the upcoming research, conducted by the Powers of Place Initiative, on the potential influence of place, space, and environment on the learning resulting from our approach at Green School. The research will take place between 20th October and 2nd November. Thank you for taking the time
to complete this survey.

Survey Questions:

When did your children start at Green School? 2008-2009/ 2009-2010 / 2010-2011

2. What made you decide on Green School for your children?

3. Overall, we are pleased that we decided to enroll our children at Green School.

Strongly Agree Agree Disagree Strongly Disagree

4. My children enjoy Green School.

Strongly Agree Agree Disagree Strongly Disagree

5. What do your children enjoy most about Green School?

6. Have you noticed a difference in the behavior of your children since they started at Green School?

Please give specific examples of changes you have noticed.

7. Compared to a conventional educational setting, I think that at Green School my children are:

Learning more Learning as much Learning less

8. Please describe what you think is different about the program that Green School offers compared to other school programs with which you have some familiarity.

9. Do you think that the physical setting of Green School has an effect on your children's educational experience? Please explain.

10. Would you be prepared to be interviewed as a part of this research? If yes, please give your name, email address and contact telephone number. Thank you.

APPENDIX F

Culture of Green School *

A GREEN school is one in which:

- Learning is by doing
- The essential skills of reading, writing, mathematics, and science are developed to a high degree
- There is a curriculum which includes the evolution from nature to ecology to environment to sustainability
- The curriculum emphasizes students getting hands dirty, and getting mud between the toes
- Students develop into stewards of the environment
- The geographical and cultural context of doing this in Bali are recognized

Mission

- Delivering a generation of global citizens who are knowledgeable about and inspired to take responsibility for the sustainability of the world.

By:

- Emphasizing "learning by doing"
- Placing great weight in developing social responsibility
- Appreciating integrity, honesty, ethics, and compassion as core underlying values
- Recognizing the importance of a holistic education

Through a Curriculum that:

- Develops the essential skills, of reading, writing, mathematics, and science to a high degree
- Has a Green aspect which evolves from nature to ecology to environment to sustainability through a "getting your hands dirty" and "getting mud between your toes" approach
- Recognizes and celebrates the local geographical and cultural and artistic context
- Is based on continuity and progression

In a Teaching and Learning Setting that:

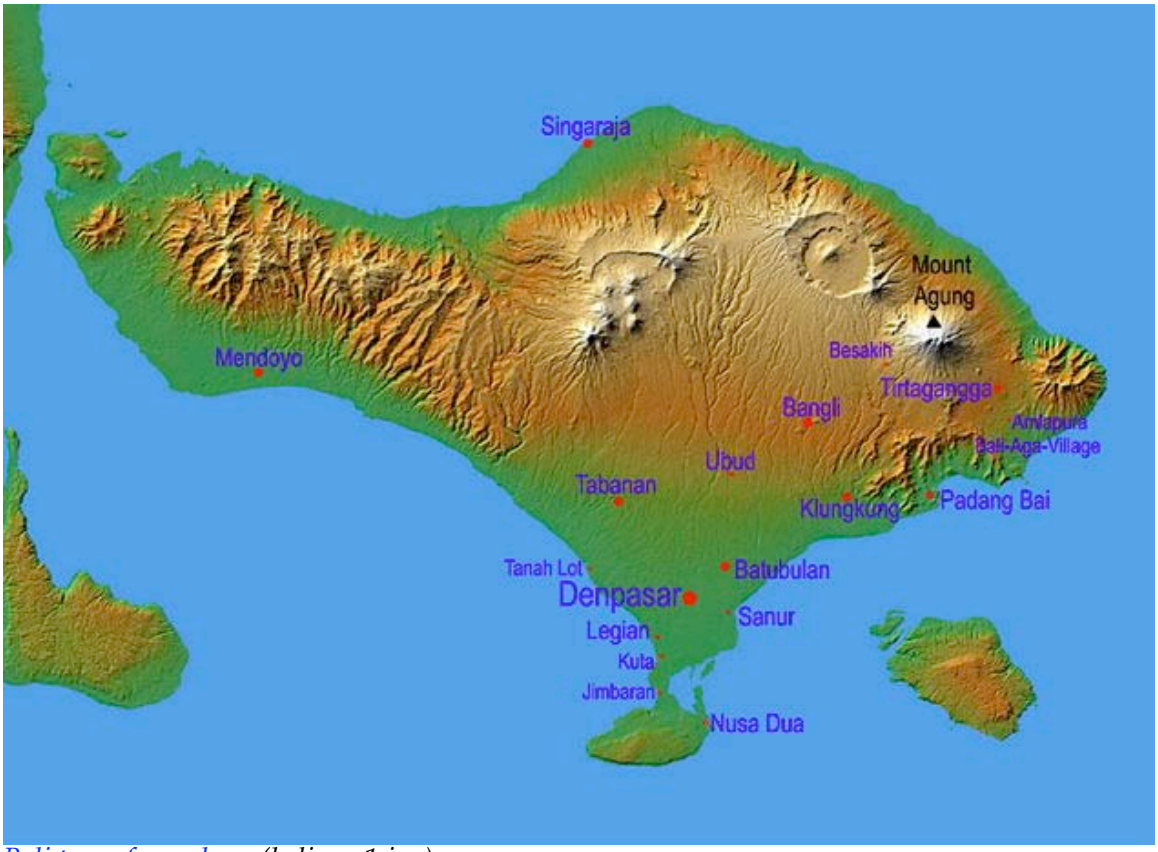
- Embraces the environment using only natural and local resources in architecturally stunning bamboo structures
- Inspires a living sense of creative problem solving
- Continually explores the use of alternative clean energy
- Seeks out scalable solutions to promote the longevity of the planet

* From Green School's Staff *Handbook for Families 2009-2010*

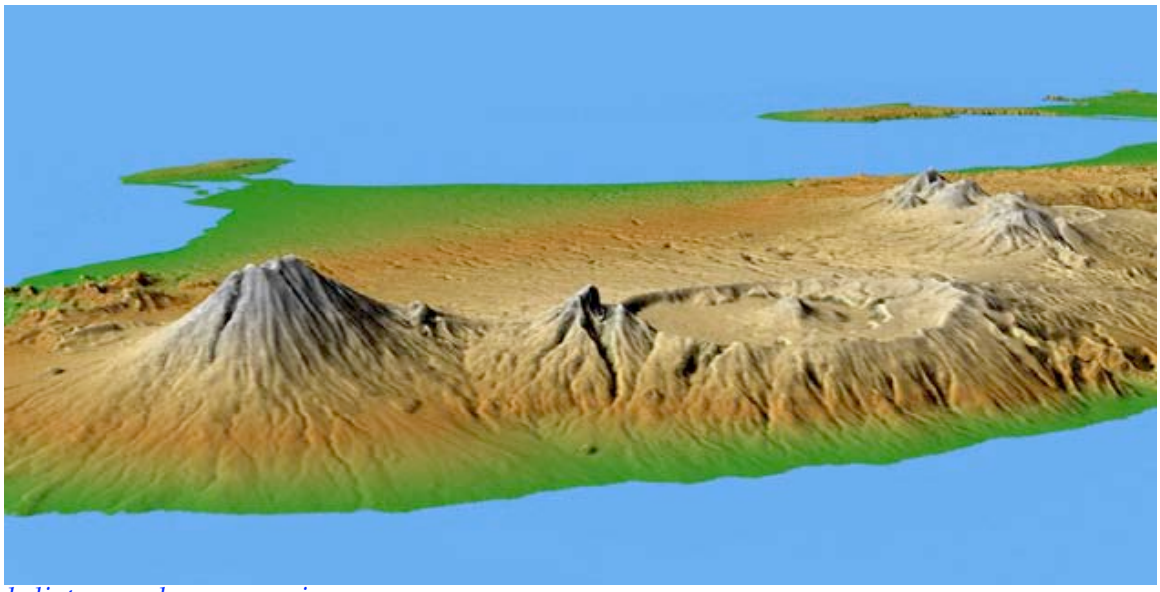
APPENDIX G

Maps: Topographical, Flat and Google Satellite Maps

Indonesia_provinces_english_sm.png



Bali tmap from above (balimap1.jpg)



bali_topo_volcanoes_sm.jpeg

APPENDIX H

Figures, Graphics and Credits

Figures and charts: Marian Hazzard and Sheryl Erickson

Photographs: Marian and Ed Hazzard, Green School (website Gallery)

ACKNOWLEDGEMENTS

We owe gratitude to many, many people for making it possible for the dream of this report to become a reality. Heartfelt thanks to each of you.

- Renee Levi and Ron Stones for the idea of conducting a research study of Green School and for their support throughout our work;

- John and Cynthia Hardy for their extraordinary generosity in making our stay so comfortable and enjoyable both at Green School and at Bambu Indah;

- Sri and Eva at the front desk of Bambu Indah and their staff for bringing us hot water and delicious meals at all hours and even doing our laundry;

- Wayan for driving us to Green School and back each day;

- Ron Stones and Andy Dalton for making us feel entirely welcome at Green School;

- Noviyani Setiawati for her scheduling expertise and great patience;

- All of Green School's teachers and administrative staff members for their willingness to share so thoughtfully their thinking about the influence of place on teaching and learning Green School;

- All of Green School's parents and students who so generously did the same;

- Elora Hardy for leading us on fascinating tours of PT Bambu and Green Village;

- Sheryl Erickson for sharing and supporting us in the creative process of turning our data into a report with such inspired and positive energy.

- Trebbe Johnson for her reflections and copyediting;

- Barbara Shipka for her feedback and experiments with graphics;.

- The Fetzer Institute for its financial support of the project;

- The Powers of Place Initiative for its sponsorship

Marian and Ed Hazzard

Your reflections and comments are encouraged and will be thoughtfully welcomed.
Contact Marian Hazzard at: marian@powersofplace.com.