

Preparing Students to Lead Social Change

Advancing The UN Sustainable Development Goals

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Students huddled in their favorite coffee shop powered by caffeine and reliable wifi.

FAR FROM BOSTON'S WINDOWLESS LECTURE halls and projector screens, the small Yucatecan town of Santa Elena became a dirt-paved classroom rooted in culture and global change. As the students of the Harvard T.H. Chan School of Public Health course, Social and Sustainable Innovation Driven by The Sustainable Development Goals (EH210), walked the narrow streets lined by indigenous and colonial architecture, the complex history of the Yucatan was quickly illustrated to all of us.

Our “*abuelita*” for the afternoon, weathered yet ever-smiling, told us the future would also feature great environmental and social changes, which had already shaped the livelihoods of her children. As her hands methodically shaped the perfect corn tortilla and placed it on a three-stone fire, her small hut filled with a distinctive smoke. At Harvard, we had learned that three billion people in the

world use solid fuels for domestic energy needs, however alternative energy sources also have important cultural, historical, and health implications. During a two-week course, this single afternoon with the Mayan community provided a living example of why we need to understand and find solutions to the social, economic, educational and environmental inequities of our world as they relate to natural disasters and climate change.

In 2015, more than 150 countries committed to the 2030 Agenda for Sustainable Development, which includes the 17 Sustainable Development Goals (SDGs) aimed at ending poverty, hunger and inequality, and building strong institutions and partnerships that lead to environmental action to improve access to health and education. The 2017 UN report showed promising progress with a 17% reduction in extreme poverty since 1999.

Yet economic losses from natural hazards have increased to as much as \$300 billion each year, with disproportionate burdens on the poorest and most vulnerable communities. Water stress is among these challenges and requires efficient ways of protecting and using water, especially for food production.

For this generation of young socially conscious students, the SDGs are becoming a “north star” to break with the shibboleth of the status quo. They see themselves as citizens of the world anxious to have relevant professional careers. Ramón Sánchez and Jack Spengler at the Center for Health and Global Environment, T.H. Chan School of Public Health, recognizing the need for immersive educational experiences, collaborated with Professor Carlos Vinajera of Universidad Autónoma de Yucatán (UADY) to craft a winter session course in Mérida, Mexico. Through this living case study students experienced firsthand the immediate impacts of changing environmental and social conditions as well as the consequences of inaction.

THE SETTING

As one of the largest cities in Mexico and the capital of the state of Yucatán, Mérida is vibrant and notably diverse with more than 60% of the population of indigenous Mayan descent. Mérida is an education hub with 16 universities and some of the best performing public schools in the nation—well placed to develop innovative solutions. As a public health course, EH210 took advantage of this intellectual base to find socially just and health-promoting business ventures.

Beyond its human capital, the city and surrounding regions provided

many examples of sustainable solutions and leadership. For example, heading eastward, we learned that the Dzilam Bravo Wind Farm currently has twenty-eight 330-foot tall wind turbines under construction and will provide renewable energy to approximately 32,000 homes in the area. Forty minutes north, the port manager of Progreso explained the key challenges of receiving up to 18,000 tons of products along the world's second longest pier. To the west, the ancient Mayan city of Uxmal and Santa Elena highlighted the local efforts to not only preserve but

restore culture, ancient architecture and indigenous communities. To the east, the Chichén Itzá showed us a great example of how climate change played an important role in the Maya's downfall.

Within Mérida itself, students walked the streets in search of examples of biophilic design, which incorporates natural elements into the built environment in an urban milieu to better understand how design contributes to climate change adaptation and sustainability. Lastly, with the support of UADY and Fundación Plan Estratégico de Yucatán (a non-profit championing sustainable development in Merida for twenty years), skill-driven, discussion-based classroom sessions became possible. Their partnership ensured our students received a holistic toolkit to design and implement timely, relevant solutions.

THE PROGRAM

During a period of ten days, students turned creative ideas into robust business plans. The course set the stage with observational and informed experiences not pedagogically available in Boston. Determined to illustrate the deep connection between human health and global environmental change, Sánchez and Spengler decided to go back 1,100 years

to the end of the Mayan civilization. Local archaeologists discussed how prolonged drought, overpopulation and deforestation led to the collapse of the scientifically advanced Mayan civilization, despite attempts to adapt to these new conditions.

While the experiences we examined spanned centuries, classroom-based teaching highlighted 21st-century techniques and methodologies necessary for practical product/service development and implementation. Students got firsthand experience searching for patents for pre-existing technologies and performing assessments of community vulnerability and climate change resiliency. To become effective entrepreneurs, students were also exposed to advanced market intelligence techniques, methods of harnessing creativity when developing solutions for local problems, intellectual property and technology frameworks, risk-benefit analysis and risk management techniques. The rigorous agenda culminated with students, powered by caffeine and reliable wifi, huddling in their favorite coffee shop on Paseo de Montejo, a colonial home transformed into a Starbucks—another sign of the changing times. Their ideation and collaboration often sparked critical discussion. How do we have the greatest environmental impact? Is there a more sustainable alternative than what we are proposing? What are the local economic and policy challenges we need to overcome?

Additionally, we started some research to evaluate the health and efficiency of the local innovation ecosystem in the Yucatan Peninsula (Mexican States of Quintana Roo, Yucatan and Campeche) to try to enhance educational, financial and legislative frameworks so social and sustainable entrepreneurs in the area may eventually have similar innovation support systems and investors like the ones found in major innovation hubs like Boston, New York and Silicon Valley.

THE STUDENTS

The magic of the course was the students themselves. Multidisciplinary, enthusiastic, collaborative and solution-



Above: A dog in Mérida; Bottom: Limestone Carvers.

driven, they were not just academics but problem-solvers. The Boston graduate student contingent included three from the Tufts University Fletcher School of International Affairs, four from the Harvard T.H. Chan School of Public Health, one from the Harvard Kennedy School and two from the Harvard Graduate School of Design. Our Mexico-based students included architects, engineers, social workers, lawyers, economists, archaeologists and directors of business incubators from several local universities such as the Universidad Autónoma de Yucatán, Universidad Anáhuac-Mayab, Instituto Tecnológico de Mérida and Universidad Modelo en Mérida. From the beginning of the course, students joined forces and formed multidisciplinary and multinational groups to develop a business plan that targeted one or several SDGs.

The Mexican students provided profound understanding of the local context, whether it was through the non-profits they led or a practical understanding of the occupational hazards faced by small communities of limestone carvers. We recognized that deep-learning could be best achieved through a co-creation process of shared discovery and knowledge. Therefore, it was no surprise to the teaching staff that collaboration became an iterative process. By week two, students had begun to restructure their groups to reflect their interests, expertise and heightened understanding of the local context. Ideation amongst team members would result in multilingual animated discussions that challenged each group member to think about feasibility, metrics of success and impact of their proposal.

THE RESPONSE

The goal of EH210 was to provide students with the necessary tools to create a socially equitable, environmentally conscious and health-oriented business plan that would be ready to pitch to potential investors. However, the response of the students was more profound. The transformative and investigative power of students was captured in the class blog (socialsustainableinnovation.wordpress.com) featuring more than eighty critical analyses focused on the intersection of the SDGs, climate action and innovative solutions. The diversity of the student body is reflected in the topics discussed, which makes the blog a useful resource and engaging read for anyone interested in sustainable development.

Ultimately, six technical business plans were submitted covering issues related to sustainable tourism, recycling, urban forest preservation, occupational hazards in local stone carving communities and coastal protection and revitalization. Within these documents, students described their business models, how they would reach early customers, who would make up their management team, outline expected revenue streams and establish how their venture would overcome current inefficiencies and challenges. On the last day of class, students gave 15-minute pitches of their venture illustrating how deeply they had considered the ramifications of their work.

Arguably, the real metric of success for EH210 is the profound relationship formed among our students. Collectively, the students deepened their understanding of the environmental determinants of health, recognized the shared expertise of their colleagues and left empowered to tackle social and environmental challenges that will shape their careers as they work to achieve the 2030 Agenda for Sustainable Development.

Written into each sidewalk tile is “Merida para todos” or “Merida for everybody,” a constant reminder why courses like these are not only important but necessary to foster global leaders. It is not about finding the solutions for the lucky few, but challenging our methods of learning to be more inclusive and addressing key disparities impacting communities globally. The path towards a healthy, more equitable planet may appear a formidable task, but if we have a shared commitment to promote innovative knowledge generation amongst our students, professors and universities, the solutions are within our grasp.

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John Spengler is the Akira Yamaguchi Professor of Environmental Health and Human Habitation at the Harvard T.H. Chan School of Public Health. His research assesses population exposures to contaminants that occur in homes, offices, schools and during transit, as well as in the outdoor environment.

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