



University of Michigan Provost's Teaching Innovation Prize

2012 WINNER



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Aileen Huang-Saad has contributed greatly to this project.

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Co-Creative, Immersion-Based Design for Global Health

Innovation Description

Challenging undergraduates to design medical equipment for use in limited-resource settings requires long-range vision and significant scaffolding. The innovativeness of this initiative is not tied to a specific class but rather lies in a sequence of experiences that has yielded a remarkable payoff. High quality design projects have led to conference presentations, an article in the *Journal of Medical Devices*, patent applications, and a spin-off social venture.

Initially, U-M's Global Intercultural Experience for Undergraduates (GIEU) program provided a framework for developing community partnerships in Ghana, where undergraduates spent four summer weeks in 2008 and 2009 observing obstetric and gynecological practices in multiple settings. These teams "proved the concept" by generating design topics deemed important by the Ghanaian Health System and suitable for U-M senior design coursework.

The 2011 global health design (GHD) cohort devoted a culminating semester (or two) to senior-level capstone design after 8-12 summer weeks of co-creative needs assessment in Ghana. Preparation for the clinical immersion entailed an orientation to international programs in engineering, self-study and a cornerstone class on the theme of maternal health, a design primer, and clinical skills observation and training at U-M.

2011 saw expansions of the program in Africa, as well as the piloting of a new program in China with industry support.

Student Comments

"It was truly a transformative experience, and I consider it one of the best investments of my time as an engineering student at Michigan. In little more than 6 months, participants have the chance to identify a unique design challenge, travel to a foreign country, develop an innovative device, and fully engage in the design process."

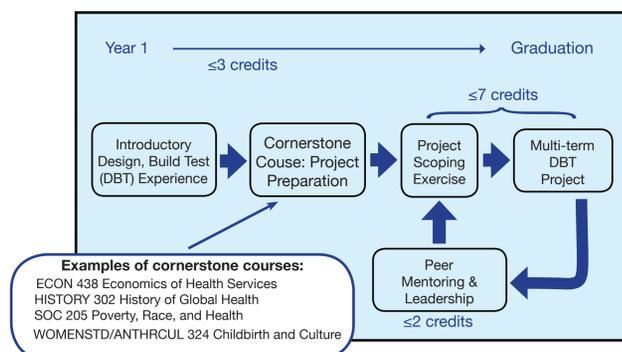
"I learned how to design a product well, but also took away an extreme appreciation for the capacity that a well-engineered product can have on society."

"Learning how to interact with midwives, physicians, and patients to conduct a needs assessment and obtain user requirements is an incredibly useful skill, and one that I would not have been able to develop to the same extent in any other course."

"I am still incredibly proud of the work that I did during that class and the success it has since garnered. We successfully published the work we did during senior design, a relatively uncommon occurrence for undergraduate students, and even spun the technology off into a startup company."

"As an engineering student it is hard to see the impact of the hours spent in class, studying for exams, and poring over homework assignments, but the Global Health Design program puts a palpable finish to four years of undergraduate education."

Examples of Teaching Innovation



Flowchart of requirements for the College of Engineering's Multidisciplinary Design Minor. (The minor is also open to students in the School of Art & Design, the Ross School of Business, and the College of Literature, Science, and the Arts.)



Careful integration of experiential learning and the engineering curriculum means a student's hard work can be recognized as a "Multidisciplinary Design Program Minor" on his or her transcript.



Part of the 2010 inaugural GHD cohort. Several team members subsequently founded a social venture, Design Innovations for Infants and Mothers Everywhere (www.DIIME.org), to pursue the commercialization of four devices.