Overall objectives

Although opportunities exist for MIT students to learn about social patterns in developing countries and sustainable design for resource-poor settings (i.e. D-lab), a single graduate-level course is not dedicated to explicitly exploring global health issues in an entrepreneurship context. In response to the apparent need for a focused global health course geared towards innovative technical solutions, ***we are initiating an educational seminar for fall 2005 that presents an introduction to global health topics, poses specific health challenges in the context of community-based clinics in Zambia, and forms multidisciplinary teams to generate feasible solutions***. Accordingly, the objectives of the seminar are to

- Educate graduate-level students on the issues surrounding global health
- Facilitate collaboration between students from the professional and academic programs within the MIT/Harvard institutions and community partnerships in Zambia
- Foster the development of multidisciplinary teams that generate feasible and innovative solutions to specific challenges identified in Zambian community-based care clinics.

The seminar has been approved and is listed as *SP.783: Engineering Capacity in Community-Based Healthcare.*

Target student population

This new course directly targets graduate-level students from the multiple advanced degree and professional programs at MIT in order to draw upon the perspective of their individual fields and create multidisciplinary project teams which contain components necessary to address challenges in community-based health. Advertisement for the course will be through word-of-mouth in MIT graduate student organizations (i.e. GSO, GAME, and Sloan Innovation Club) and enrollment in the course will be limited to 12. Two teams consisting of students from the Schools of Engineering and Social Sciences, the Sloan School of Management, the Whitaker College of Health Sciences and Technology (which includes both engineering and medical students), and the Harvard School of Public Health will be formed from the 12 enrolled students. Another critical component of each team will be students from the University of Zambia (UNZA), who will introduce the specific design challenges from their communities (via video documentation) and contribute throughout the solution development process. By connecting MIT students with people in target communities, students will gain a greater understanding of how global health topics impact the delivery of community-based care as well as the local design considerations important for implementing a successful technical solution.

Course format

The 14-week course will be divided into four 3-week sections where each section focuses on a specific topic of global health that relates to patient care challenges identified at public clinics in Lusaka, Zambia. The four focus areas will include maternity care, AIDS/HIV treatment and management, health diagnostics, and information technology in patient management and tracking. An expert lecturer, either from within the MIT/Harvard community or from an outside institution/organization, will open each of the four sections by introducing the focus area topic in relation to global health and students will receive a pertinent reading assignment to supplement information presented by each guest lecturer. The first week of each section will also include interaction with UNZA students through a video presentation in which the Zambian students

illustrate how specific challenges faced by their community clinic and the Power of Love organization relate to the broader global health topic. The video presentation and interaction with UNZA provides students with the unique opportunity to gain contextual knowledge of healthcare in Zambia. The second session requires each multidisciplinary team, as described previously, to present the challenges from the medical, public health, engineering, and business perspectives. Between weeks 2 and 3, each team will brainstorm a list of proposed ideas to address these challenges. Then, during week three, teams alternate in leading the discussion and evaluation of the brainstormed ideas, while receiving feedback from members of an external advisory board.

The final two weeks of the course will be dedicated to addressing topics related to the translation of ideas into working prototypes and their eventual implementation and/or commercialization. For this aspect of the course, teams will choose one of the feasible ideas generated throughout the four sections of the course and develop it into a product proposal in coordination with UNZA students. Design that Matters, a consulting firm for developing country technologies, has committed to providing teams with guidance through the project development phases and we are seeking a similar partnership with PATH, an international nonprofit organization aimed at improving global health, with the help of CIMIT and the MIT Service Learning Center. As another strategy to promote idea implementation, we will encourage and prepare teams to pursue their ideas beyond the course through MIT programs, such as the IDEAS competition, 50k Competition, and PSC fellowships. Lastly, all ideas, proposals, and commercialization plans generated in the course will be made available, via Internet publication, for partner communities and organizations in Zambia to pursue. This opportunity to understand the context of the healthcare challenges and maintain direct local connections will maximize the potential for impact from student enterprises and lower the barrier to implementation.

Course evaluation and measurable learning objectives

The course will be assessed on the basis of three metrics: **results** in the community, **impact** on the students, and **development** of curricular materials. The community results will be evaluated through direct observation and community partner surveys during the term and as a follow-up after the completion of the course. Pre- and post-course surveys will be used to evaluate how the students have been influenced by the course and their impressions of how they have developed through the course of the semester. The course instructors will engage in regular discussions and documentation of learning throughout the semester in order to gauge the success of the curricular materials and continually improve them. Advisor feedback will also be solicited in all three areas to supplement the other measurements.

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