

THE HARVEY MUDD COLLEGE

Global Clinic Program





“Global Clinic was the aspect of my engineering education that prepared me most for my career. I loved pooling our team’s diverse skills and experiences to solve a problem that integrated so many

forms of engineering and computer science. The pressure to have several working prototypes by the end of the year was intense, but traveling to Kenya as a team and installing the prototypes at schools and community centers made the tremendous hard work worth it. We had been pushed to learn new skills and perform at a high capacity, and the motivation of creating a product that had tangible impact pushed us through to the end.

“By my senior year, I knew I wanted a career that integrated my technical background with my passion for social issues around the world. Global Clinic was my first experience working in a field I felt truly passionate about. I learned a lot through our successes and failures and took these lessons with me after graduation. I’m thankful for the support I received, and I’m proud to have had the chance to do such real and meaningful work at such an early stage in my career.”

Nithya Menon '16

Engineering major, Harvey Mudd College

Project

Low-cost Monitoring of Remote Rainwater Catchment Tanks

Sponsors

RainCatcher Inc. and Harvey Mudd College

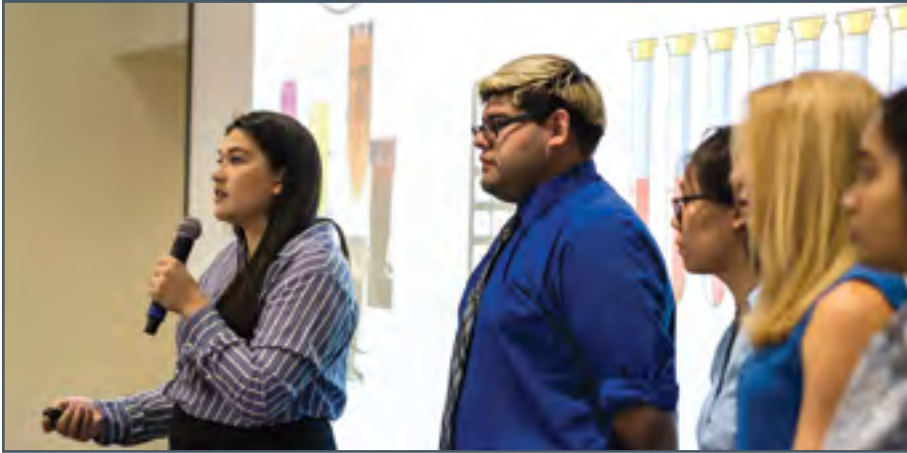
RainCatcher is a nonprofit organization working to combat the global issue of clean water access and has installed rainwater catchment systems in regions of Kenya, Uganda and the Navajo Nation. The HMC Global Clinic team designed and built a device that communicates details about each tank to RainCatcher. This device allows RainCatcher to collect quantitative data and improve the reliability of its systems.

THE GLOBAL CLINIC PROGRAM AT A GLANCE

The mission of the Harvey Mudd College Global Clinic Program is to prepare students to engage in the practice of solving open, interdisciplinary problems in a global context as members of a team.

Built upon the Harvey Mudd Clinic Program, the Global Clinic Program supports long-term, sponsored engineering, mathematics and science projects. Teams of Harvey Mudd students work on international projects with individuals from different countries, cultures and institutional backgrounds and with different disciplinary interests and languages, but with a common unifying purpose and project goals. Global Clinic students make a series of presentations and written progress reports during the year, honing their technical writing and public speaking skills.





What is the Harvey Mudd College Global Clinic Program?

- The program prepares students to become innovative engineers and scientists in a global context.
- Projects include a corporate or foundation sponsor and/or an international university partner.
- Teams consist of upper-level Harvey Mudd students and Harvey Mudd faculty as well as members of the partner global organization(s), who collaborate on a project during the academic year.

What does the sponsor gain?

- Useful project results, such as a hardware or software prototype, a device or program to be put into production, a mathematical analysis and research investigation or a design proposal.
- Ownership of intellectual property rights—patents are common.
- Fresh insight by a highly talented team of students.
- High visibility on campus throughout the academic year, beneficial to recruiting efforts.

What is the sponsor's involvement?

- Submission of a project statement during the preceding academic year.
- Appointment of liaison(s) to guide team to desired results through weekly contact.
- Payment of Global Clinic fee.

Global Clinic Program Goals

- To foster in our graduates a deeper understanding of the culture, language and business practices of another country and to communicate shared interests and objectives in the course of collaborative team projects.
- To offer international sponsors a partnership role in the education of the next generation of engineering, mathematics and science graduates.
- To benefit society by promoting international cooperation and partnerships to address the challenges of the global community.

Program Contact

Director of Corporate Relations, 909.607.7015 or email clinic@hmc.edu

"I was privileged and delighted to be the liaison for the first Global Clinic Project with an Indian university: the Birla Institute of Technology (BIT) in Ranchi, Jharkhand. At the time, I was a visiting research professor at BIT. The HMC students had a strong, diverse education over a range of disciplines, including general engineering, chemistry and global economics. The BIT students had a strong engineering education with a distinct emphasis on mechanical engineering. Despite, or because of, these differences, the students bonded well and brought these diverse talents to the project at hand.



It was clear from the start that the HMC students brought a higher level of innovative thinking to the project, and the BIT students brought a stronger focused engineering discipline. It was wonderful to see these students working together and, in the process, sharing their cultural differences. There is no doubt in my mind that the Global Clinic Program benefited all involved: students, teachers and liaisons. Being involved has been one of the best experiences of my career, and I continue to seek opportunities for other projects. In my opinion, the world would be the better for an expansion of such programs to more universities in other countries; a goal that deserves to be encouraged and supported."

Dr. Gordon Pickett

*Engineering Innovative Solutions LLC
Global Clinic Liaison, Birla Institute of
Technology*



“The Global Clinic Program was, to say the least, challenging, especially since the project took us out of our comfort zone and into uncharted territories. This, however, allowed

me to nurture and hone critical and creative thinking, communication and management skills. The whole experience was an eye-opener for me, in particular having the opportunity to experience a real-life borderless workplace experience. It was at the same time also meaningful, knowing that the success of the project is likely to have a positive impact on the educational environment.

“My Harvey Mudd Global Clinic Program experience was fulfilling, impactful and lasting. It was beyond my wildest imagination, and I would not trade it for anything.”

Sharon Chang

Physics major,
National University of Singapore

Project

Design, Building and Validation of a Low-Cost Real-Time Polymerase Chain Reaction Instrument for Copying and Quantifying DNA. A collaboration between students at Harvey Mudd College and the National University Singapore, the project goal was to design, build and validate, a low-cost scientific instrument for making copies of DNA and quantifying the amount of DNA during the copying process.

Sponsor

Applied Biosystems

Overview of a Global Clinic Project

Project Planning and Development: In the year preceding the start of the Global Clinic project, sponsors are identified, project details defined and liaisons are assigned to work with the student/faculty teams from partner institutions. The typical team includes three or more students and faculty advisor.



Project Timeline: The project runs for one full academic year. Projects and partners are identified and commitments confirmed typically by early spring before the Global Clinic project starts.

Academic Year (September–May): If partnered with another institution, the student teams remain in weekly contact during the academic year via email, teleconference and videoconference and with the sponsor liaisons via a weekly multi-conference call. Global Clinic teams from both abroad and in the U.S. engage as a larger group in general Clinic support activities, such as design reviews and project presentations. Global Clinic project milestones and deadlines are aligned with those of domestic Clinics. The Harvey Mudd and overseas Global Clinic teams work together on communication, report writing and prototype assembly. Project work culminates in final presentations at the sponsoring organization and on the Harvey Mudd campus at the end of the academic year.

Site Visits: Each Harvey Mudd team travels once to the project site for prototype development, testing or implementation. When applicable, university partners travel to Harvey Mudd to work locally with Mudd students.

Faculty Supervision: Faculty members are appointed to guide the teams, monitoring progress and assisting with facilitating team communications. The faculty members work cooperatively to ensure that the academic goals for the students are met. Each participating institution takes responsibility for hosting the student teams during site visits.

Sponsor Involvement: The sponsor submits the project statement in the preceding academic year. Sponsor liaisons are appointed to guide the teams to desired results through weekly contact. In addition to appointing a project liaison, the sponsoring organization pays a fee to support the program. Payments are typically made in three equal installments at intervals during the project year.

History of Harvey Mudd College's Clinic Programs

The Harvey Mudd Clinic Program (Clinic) is the flagship of the College's engineering program and includes three courses in the junior and senior years. It brings student teams together with sponsoring industry, government and nonprofit organizations to solve real-world industry problems in an academic setting.

The idea for the Clinic Program originated in 1963 in the Department of Engineering to channel student initiative, drive and intelligence into real-world projects. Founding professors Jack Alford and Mack Gilkeson felt that the best way to do this was to give students "clinical" experience like that which medical students receive as part of their training—thus, the name Clinic. As a result of the Clinic Program, Harvey Mudd College has been at the forefront of undergraduate engineering, mathematics and science education for more than 50 years. Almost 500 organizations have participated in the Harvey Mudd Clinic Program, resulting in over 1,600 completed projects.

In 2012, Gilkeson and fellow engineering professors Clive Dym and Richard Phillips received the prestigious Bernard M. Gordon Prize for Innovation in Engineering and Technology Education in part for their roles in founding the Clinic Program.

The philosophy of Clinic is at the heart of the Global Clinic Program, which includes students from all departments at Harvey Mudd College.

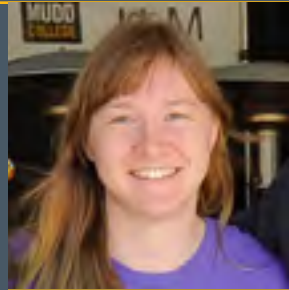
Recognizing that the world is becoming increasingly "flat," engineering professor Anthony Bright began the Global Clinic Program in 2005 to prepare students to become innovative engineers and scientists in a global context. The first two Global Clinic projects were run in Puerto Rico, with sponsors Amgen and Hewlett Packard and university partner the University of Puerto Rico. Harvey Mudd continues to establish new partnerships with overseas universities and sponsors. Projects have been run successfully in several countries, including Iceland, India, Japan, Kenya, Uganda and Singapore.

As companies expand their operations abroad, higher education has responded with new programs to prepare students for work in a time of unprecedented global demands for energy, food and shelter. A key element of the College's strategic vision is to ensure that its graduates are among those prepared to meet these and other global challenges.



Photo credit: Patrick Little

"During my year on the Global Clinic team I learned a lot: how to work with a team, lead a team as a project manager, iterate a design and coordinate a project with a wide variety of stakeholders. Our team designed and built a device that monitored the status of water catchment tanks, which are often located in remote areas of Kenya or Uganda. Our work directly affected people who accessed their drinking water from these tanks on a daily basis, creating a positive societal impact in line with my personal values as well as HMC's mission statement. In addition to applying computer science and engineering principles to the project, it was necessary for our team to consider differing cultural norms to understand how our prototypes might be used both by the nonprofit organization and by the people who used the tank systems. Our team travelled to Kenya to install our functional prototypes. The Global Clinic project was one of the highlights of my time at HMC and an experience that still impacts my professional interests and plans."



Heather Young '16

Joint Computer Science and Mathematics major,
Harvey Mudd College

Project

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About Harvey Mudd College

Since its founding in 1955, Harvey Mudd College has been dedicated to educating a special breed of scientists, mathematicians and engineers with exceptional breadth in their technical education and a firm academic grounding in the humanities and social sciences. A student's coursework covers humanities and social sciences, the Common Core (in biology, chemistry, computer science, engineering, mathematics and physics) and the student's major.

Harvey Mudd College has earned national recognition for its accomplishments, and its faculty and students rank among the nation's best. Harvey Mudd has consistently been rated as one of the most selective colleges in the nation. A low student-faculty ratio enhances close interaction between students and the faculty, all of whom hold the terminal degree in their field and many of whom have industrial experience.

Located in Southern California, Harvey Mudd is a member of The Claremont Colleges, a group of five distinctive undergraduate colleges and two graduate institutions.



Global Clinic Endowment

The Vickery Family generously supported the Harvey Mudd College Global Clinic Program with a \$1 million endowment in 2009. Robert Vickery, an aerospace engineer, and Joan Vickery, a mathematician and software developer, were proud of the way their son, John Vickery '90/91, flourished in the intense atmosphere of Harvey Mudd. They loved how the Clinic Program helped John put his education into practice. Their son's transformation inspired them to give generously to the Global Clinic Program and help countless talented students realize their potential and find their passions.



Linda Elderkin, President Maria Klawe, Yasemin Vickery, John R. Vickery '90/91, Lisette de Pillis and Richard Elderkin.

Become a Global Clinic Sponsor

It is always the right time to reach out about sponsoring a Global Clinic project, and we are happy to guide you through the process.

- Get inspired. Visit our website to find descriptions of past Global Clinic projects at hmc.edu/globalclinic.
- Think big. What projects would your organization work on if you had additional staff? These ideas often make excellent Clinic projects! We are here to help you scope the project appropriately.
- Reach out. Contact Harvey Mudd's director of corporate relations at 909.607.7015 or clinic@hmc.edu.

