

Thoughts for Harvey Mudd College's Strategic Plan (provided 2005-2006)

Excerpts for Workshop 2: *Optimizing our Interface with Society*

These have been (very slightly) edited – only to highlight ideas fitting the themes of workshop #2

Facilities for teaching and research. The Olin Center, which is the college's most recently completed academic building, was built more than a decade ago. Many other colleges and universities have constructed new science buildings since the early 1990s which incorporate design features of versatility, openness, and visual appeal largely absent at HMC. By comparison, many classrooms and laboratories at HMC seem cramped, dark, cluttered with equipment, and restricted to particular uses. (The redesign of the engineering project studio is a notable counter-example.) To what extent do our current spaces for teaching and research promote the educational goals of our curriculum? Are changes needed in our facilities to promote current teaching practices that favor creativity, communication, interdisciplinary work, and the use of technology in both teaching and research?

Leadership. Making HMC a leader, or even the leader, in undergraduate science research is a valuable goal and one ideally suited to the college's mission and character. To approach this goal strategically (i.e., to develop a plan as well as a goal), it would be useful to consider and define explicitly what this means. How is "preeminence" in this area to be measured? Is it measured now? If there were a ranking of undergraduate institutions, or academic programs, for comparative preeminence in the area of student research, what are, or would be, the criteria to be considered? If we were the leader now, or if we were in the top ten, how would we know this? Compared to whom? Do we now have, or could we assemble, the data of outside observers to substantiate a claim to leadership?

David Coons

Undergraduate Research. It used to be that research for undergraduates was relatively rare. Those of us graduating from HMC during that time had a distinct advantage in graduate school - both in our applications and our eventual performance. Nowadays, though, undergraduate research is expected. Thus, it's a no-brainer that HMC continue its active research efforts, but the question now becomes what can it do to regain the edge it had when it was one of the few institutions that demanded undergraduate research? Simply having a good research program is not enough. What else can/should it do? Yet more research? Better quality research? Interdisciplinary, multi-faceted research? Public outreach (this is an increasingly important topic for modern researchers and grant acceptance)? What?

Scot Kleinman ('83)

Social and Emotional Well-Being: The process of receiving an excellent Harvey Mudd education places tremendous pressure on students, who are often away from home and parents for the first time. These very young adults are in a crucial stage of life development. How can the college foster even more healthy emotional, spiritual, and social growth for its students? (Current examples include the Honor Code, the emphasis on cooperative learning, and team-oriented courses such as Clinics.) Can HMC better prepare students to "assume leadership in their fields" by providing not only an intellectual understanding of the humanities and social sciences but also by addressing their formation as persons in a holistic sense?

Jonathan Ball
Class of '91

Leadership: Fostering leadership ability in our students is an acknowledged component of our mission statement. We can significantly strengthen this part of our mission if we begin to consider this one foundational element: leadership development in the faculty and staff who are charged with promoting student leadership skills. In order to stay competitive and nimble as an institution, we should all understand leadership structures (such as heterarchy versus hierarchy) that have been shown to hold institutional advantages in a changing society or marketplace, while considering how best to consciously develop leadership abilities and opportunities among the HMC faculty and staff. We can teach leadership best by being expert leaders ourselves.

Lisette dePillis

Invention Clearinghouse: Americans in general and Harvey Mudd College students in general are an innovative breed. We have useful and marketable ideas all the time, but are stifled by the difficulty in getting product ideas to market. The patent process was once a conduit for ideas that made America the world leader in innovation, but nowadays is expensive and inaccessible to the average inventor. The HMC Entrepreneur Network seems geared toward business startups, but many engineers are not businessmen. Short of starting your own business, all that exists for such people are bunko operations that claim to market your products, but who only pocket your money. HMC could use its contacts and resources to develop some sort of Invention Clinic that would act as a clearinghouse for marketable ideas, researching the ideas and connecting them with manufacturers. HMC could enhance its coffers by receiving a percentage of any contracts brokered.

This would be an excellent experience for any and all students (work-study, perhaps). Who knows, if something like this catches on, it might spark some sort of innovation renaissance in America; it's not like the economy couldn't use a shot in the arm.

Ross A. Watkins

Transformative experiences What conditions promote the sorts of life-changing experiences that are the high point of an outstanding education? Looking back, what college experiences changed the lives of our students and alumni - be it inspiration to enter a profession, discovery of a new creative passion, exposure to a new intellectual perspective, or immersion in an experience that changed the way they view the world? How might we study and better understand these transformative experiences, including their frequency, characteristics, origins, and impacts? What new institutional structures and resources (facilities, curricular reforms, personnel, grants for students, etc.) might we put in place to make life-changing experiences a hallmark of a Harvey Mudd education?

Paul F. Steinberg

Creativity What would it mean if creativity were to become as thoroughly embedded in the collective educational objectives of Harvey Mudd College as, say, quantitative facility? If we were to commit ourselves as seriously to provide opportunities for the development of individual creativity as we do opportunities for undergraduate research? If we were to think big and imagine the effect of an HMC Center for Creative Activity that would unite fine artists, computer scientists, writers, mathematicians and many others in a space that would encourage synergy across expressive forms? The cultivation of individual capacity for creativity has long been seen as a hallmark of liberal education, but more recently creativity has attracted the attention of students of professional development. Recent scholarly work by David Kirp, Richard Lanham and, most

notably, Daniel Pink (*A Whole New Mind: Moving from the Information Age to the Conceptual Age*) is mirrored by business periodicals that have recently asked “Is the MFA the new MBA?” For Harvey Mudd, vocational and avocational justifications of a renewed and thorough-going embrace of creativity dovetail perfectly and offer us an important way to rethink our goal of primacy in both technical and humanistic education.

[This suggestion arises from conversations at the recent Dept. of Humanities and Social Sciences retreat and reflects the contributions of a number of department members.]

Service to Community. What role can service to our local and global communities play in promoting leadership development among HMC students? How might service to community facilitate understanding of society, a necessary building-block for understanding the impact of one's work on society? What are the costs and benefits of service to community for all stakeholders? To what extent should such service be linked with course-work? How might course-linked service (i.e., service-learning) facilitate understanding of course content and vice versa? What kinds of support would faculty need in order to effectively and efficiently integrate service-learning into their courses? What types of activities constitute service to community?

Student Outcomes. What outcomes do we most desire for our students? In what ways do our curriculum and campus culture cultivate vs. stunt these desired outcomes? Beyond providing intensive opportunities to learn the tools of our disciplines, to what extent are we compelled to contribute to the overall self-development of our students?

Deb Mashek

Leadership: The mission statement challenges us to educate our students, among other things, *so that they may assume leadership in their fields*. How can we best promote leadership development, *i. e.*, promote the attitudes and skills that will allow and encourage our graduates to *make a difference*?

Flexibility in the curriculum: Every major portion of our curriculum, including the technical core, the humanities and social sciences, and the majors, has strong requirements that are easily defended. Yet taken together, the resulting overall rigidity is seen to be oppressive by many students and faculty. There is no doubt that we have one of the least flexible sets of requirements in the nation. It can also be argued that the paucity of choices is a suboptimal way to educate future leaders, who need to get used to making more of their own decisions. Humanities and Social Sciences has recently shown that it is possible to provide more flexibility. How can the technical core requirements be made more flexible? How can the major requirements be made more flexible?

Tom Helliwell

Campus-Wide Sustainability HMC should develop and implement a campus-wide sustainability policy. The college has already taken some very big steps by certifying Sontag and Hoch-Shanahan as LEED Green buildings, and certainly a logical extension of those actions is to assure that those buildings are *operated* sustainably. This in turn will have implications for the housekeeping and maintenance procedures on the rest of the campus, as it is impractical to expect the staff to use different procedures and materials in some buildings versus others.

The implications of sustainability policy go to all aspects of college operations: grounds keeping, housekeeping, energy, water, buildings, transportation, travel, procurement, as well as to educational content. The issues of global climate change should be at the top of the list of

impacts being addressed, and it would appear that the adoption of goals consistent with the Kyoto Protocol for limiting greenhouse gases would be an appropriate and achievable goal. Adoption of the Talloires Declaration (copy attached) is probably also a good starting point.

The proposal submitted by Richard Haskell deals with the educational element. This proposal focuses on the non-educational elements and on the need to integrate both with a coherent plan. It would seem most appropriate to convene a committee representing the various constituencies to discuss and formulate a coherent set of high-level of goals and policies which could then be implemented as appropriate at each level of activity in the college.

Malcolm Lewis

Diversity How do we attract and retain students, faculty, staff, administrators, and trustees from groups traditionally underrepresented in science, math, and engineering? What steps would be necessary to help ensure the success of students who are bright and motivated, but whose high school could not provide the same preparation as many of our current students? How can we make our campus more embracing of diverse backgrounds, heritages, lifestyles and beliefs? How can we educate ourselves on a continuing basis about issues pertaining to diversity?

Popping the Mudd "Bubble" How can we serve our community and beyond? What opportunities exist to incorporate service learning into our curriculum? What opportunities exist outside of the classroom to foster student motivation for community service, activism, and leadership? When students take the initiative to undertake significant acts of service, such as the group that traveled to the Gulf Coast over spring break, how can we best support them?

Teaching Facilities Given the increased student enrollment in recent years, to what extent have we already outgrown our current classroom space? What does the classroom of the future look like? What technology can we incorporate into our classrooms to aid instruction? How can the physical arrangement of classrooms be optimized for use with modern teaching pedagogy that emphasizes active and collaborative learning as opposed to traditional lectures?

Karl Haushalter

Continuing our push for diversity Should HMC continue to increase the diversity of its student body, faculty, and board of trustees? If so, how? There are a number of reasons for HMC to continue to move on the diversity front. The first is that demographic trends among the college age population and sociological trends with respect to choice of major and profession suggest that if HMC is to continue to attract a reasonable fraction of the most able students entering STEM disciplines, it will have to become continuously more attractive to women and underrepresented minority students, for they are becoming an increasingly large fraction of our potential applicant pool. Furthermore, our graduates will increasingly be called to work for clients and with colleagues from diverse backgrounds, and an experience of diversity while at HMC is likely to improve their ability to navigate in that environment.

To the extent that HMC has long sought to focus its efforts on the public good as well as private interests, considerations of social justice and what some feminist scholars have come to call "strong objectivity" in the sciences suggest that we should be trying to increase the representation of women and underrepresented minorities in the STEM disciplines. After substantial successes in attracting women students in the late 1990's and through 2003, we have seen a decline in the number of matriculating women in the past couple of years. Underrepresented minority recruitment has raised the fraction of underrepresented minority students from around 6% in the early 1990's to 18% in the class of 2010. How can we reverse the trend among women and continue our successes among minority students, and how can we improve the retention gap between that for white male students and others.

Dick Olson

Technology in Society: Engineers and Scientists are working farther and farther away from the centroid of modern society. Be they biochemists working on genetic manipulation of plants and animals or computer scientists designing algorithms to assess and prioritize information that might identify terrorists, they are doing work most citizens perceive as magic. Mudders are at the top end of the technical capability scale, how can they also communicate with the majority? History has no shortage of government leaders that used technological superiority and for political advantage. Certainly we have companies that have similarly used it for financial advantage. Is HMC producing a "different" perspective that combines technical excellence with a sense of propriety?

I think that this is a unique aspect of the mission statement, that doesn't get the notice that it should.

Randy Saunders

Diversity. In my short time here at Mudd, I have been generally impressed with the College's desire to address issues of diversity. The College has clearly made important strides in terms of gender and ethnic diversity, especially. Much more work, however, can and needs to be done.

I was surprised, for example, that the incoming freshman class is down to 28% women from the current average of 33% women at the College. Additionally, it's my understanding that there have been some changes and personnel shifts in the Office of Institutional Diversity. Regardless of any particular shifts in positions or personnel, I believe that this College needs to continue to give significant, long-term institutional support to important initiatives like this. As we all know, major gains can only be made when there is an unequivocal commitment of resources and personnel to such efforts.

Diversity in all of its forms -- gender, ethnic/cultural, class, geographic, sexual orientation, etc. -- is, I believe, part and parcel of our mission as a "liberal arts" college of science and engineering. It is my sincere hope that, under the leadership of President Klawe, HMC can continue to move boldly forward in this area.

Chris Tirres

Leadership: As we all know, Mudd's mission statement discusses educating students "so that they may assume leadership in their fields with a clear understanding of the impact of their work on society." Has the college been too focused on leadership as technical expertise instead of taking a broader view of leadership? Mudd's incoming freshman class consistently outscores almost every other institution on SAT scores. By placing such an emphasis on these scores and demonstrated technical abilities, is it possible that the college is missing other perspective students who have strong leadership capabilities? Are there other criteria which the college could use in selecting perspective students that would increase Mudd's ability to educate leaders? Are there changes to the curricula or other opportunities that Mudd could offer to students that could help with leadership development? Does Mudd's size have an impact either on its ability to educate its students for leadership or on its ability to produce enough leaders to have a sufficient impact on society?

Howard Deshong '89

Student/Faculty Research A distinguishing feature of Harvey Mudd College is its involvement of undergraduates in research. Research experiences have tremendous educational value: involving students in open, unstructured problems; engaging students in creative intellectual endeavors; reinforcing material taught in the classroom; and developing problem solving and communication skills which transcend disciplinary boundaries. A major recent study concluded that across gender, ethnicity and institution type, research enhances the educational experience of undergraduates, both in terms of their general satisfaction, and in terms of learning gains in areas such as: learning to work independently, learning to overcome obstacles, ability to analyze data, self confidence, ability to integrate theory and practice, learning ethical conduct, as well as many others.

Our own students and alumni report that their research experiences were among the most important and memorable parts of their undergraduate education. The 2003 Faculty Ad Hoc Committee Report noted that "as a testament to its importance, many of the best graduate programs expect undergraduate research for admission." Indeed, Harvey Mudd has the enviable record of sending a larger fraction of its science graduates to doctoral programs in the sciences than any other college or university in the country.

Given that Harvey Mudd is a college of science, mathematics and engineering, are we uniquely positioned at the national level to make undergraduate research an integral part of the education we offer? Should we offer all students the opportunity to be involved in a summer research experience (where we broadly define research)? Could an institutional research program become a selling point for the college? How can our faculty be best supported in their supervision of undergraduate research, particularly summer research? More specifically: What are the signs of a successful research effort at the individual level and at the institutional level? Are our current academic-year and summer-research efforts serving the same goals?

Ran Libeskind-Hadas and Tom Donnelly

Broader Responsibilities. Now that HMC has reached its 50th birthday & is no longer an infant amongst institutions of higher learning, what new responsibility should it shoulder to help the world with its most serious technological problem(s)?

William Konya '83