Human
Sciences &
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Advanced
Research
Institute
STANFORD UNIVERSITY

January 5, 2010

To: Ann Arvin, Vice Provost and Dean of Research

From: Roy Pea, Co-Director, H-STAR
              Byron Reeves, Co-Director, H-STAR
              Keith Devlin, H-STAR Executive Director

Subject: Annual Report for H-STAR for FY 2008–2009[1]
              (Response to email of October 16, 2009)

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[1] Some confidential personnel and financial details have been deleted from this posted version.

1. Overview

H-STAR is an interdisciplinary research institute, with independent lab status. It includes a research center, SCIL (Stanford Center for Innovations in Learning, established in 2002), with its own faculty director (Roy Pea), and runs an industry partners' program, Media X.

H-STAR focuses on advancing the human sciences, often in the context of their application to the design and uses of information technology and their influences on people. All H-STAR programs conduct research at the intersection of human sciences and information technology in the areas of learning, mobility, collaboration, entertainment and commerce.

We pursue this mission in a number of ways: we organize and service interdisciplinary grants, contacts, and other funding opportunities; we bring together faculty to work collaboratively on projects — both across the campus and in collaboration with faculty at other universities around the world; and we organize events such as lectures, small seminars, workshops and conferences, sometimes through our Media X program.

The total volume for federal and non-federal sponsored research funding awarded to H-STAR in FY09 was $4.08M, of which $1.38M was F&A (indirect cost charges).

Having a broad scope of interest that has commonalities with every School, H-STAR is defined by research mission rather than permanent faculty affiliation; we facilitate, fund, and support research within our mission anywhere on the campus. Nevertheless, H-STAR does have a *de facto* core faculty. A total of 10 Stanford University Academic Council faculty carry out research wholly or principally within H-STAR, and an additional 32 faculty have one of more projects within H-STAR or else are actively involved in H-STAR activities. H-STAR also provides the research base for 23 (non-faculty) Stanford researchers (predominantly senior researchers with doctoral degrees) who are working on projects led by faculty PIs.

H-STAR researchers who reported (a few did not) produced 277 research papers and 13 books in the past FY. A complete list is provided as an appendix to this report.

H-STAR employs 24 regular staff (academic and non-academic FTE), of which 6 employees are performing shared administrative support functions, such as research administration, financial, human resources, and building management in two locations, Wallenberg Hall and Cordura Hall. We also currently have 25 casual and temporary employees. In FY09, under academic staff, we supported 30 graduate students.

The FY09 total administrative costs for H-STAR, without counting administration for Media X, but including the high performance classroom project in Wallenberg Hall, was approximately $1M. This number includes the $285K base allocation and $307K matching fund transfer from the President and Provost to support the high performance classroom project.

The primary source of funding for H-STAR research is the normal system of federal and foundation grants. The infrastructure costs (primarily support-staff salaries) required to support the institute's research and outreach activities and to ensure compliance is approximately $**1**M, of which roughly a half is covered by our current allocation from the University. The institute develops the remaining half of the budget from external sources.

2. H-STAR's mission and its relation to the Stanford Challenge

H-STAR's primary research focus is on people and technology — how people use technology, how to better design technology to make it more usable (and more competitive in the marketplace), how technology affects people's lives, and the innovative use of technologies in research, education, art, business, commerce, entertainment, communication, national security, and other sectors of society. H-STAR is also the locus of basic research into the nature of information processing by humans and machines. Among the large, complex, global problems that are at the heart of the H-STAR research agendas are:

- **Reducing complexity of technology** to enable its universal and creative uses for work, learning and other vital sectors of life
- **Closing digital divides** across class, race, gender, age, languages and nations, so that access to and fluencies with technologies can provide equal opportunities to learn and work productively for personal and societal well-being
- **Accelerating innovation** in the creation and diffusion of products and services that better identify and meet human needs
- **Solving security and trust problems** of computing, communications, and information systems at home, work and in governmental affairs
- **Ensuring pervasive safety and health** of people over the lifespan with human-centered technology innovations

Of the eight specific targets listed in the Stanford Challenge, four are highly central to the activities of H-STAR:

1. *Multidisciplinary Research Across the University*. H-STAR's mission is to promote and support interdisciplinary research campus-wide. Over the past six years, H-STAR's Media X program has used income from industry partnership fees to fund around $2.5M of (predominantly interdisciplinary) faculty research across five Schools.

2. *International Initiative*. See Section 7 of this report for the list of H-STAR's extensive activities in the international arena.

3. *Improving K-12 Education*. H-STAR is the only organizational unit on campus focusing on the multi-disciplinary core of theory, research, and methods that are needed for world-class work on the central topics in K-12 learning sciences and technology design. See also section 8a for a description of the NSF funded LIFE Center's research on these issues.

4. *Extending the Renaissance in Undergraduate Education*. While the mission of H-STAR is university research, the H-STAR faculty members are among campus leaders in undergraduate education.

3. How H-STAR works

H-STAR provides affiliated Stanford faculty and researchers with office space, physical and "virtual" meeting rooms (via IP videoconferencing), lecture rooms, lab space, seminars and lectures, printing and copying facilities, secretarial services, the services of administrative, financial and technical support personnel, assistance with identifying and securing funding for research, and, through the Media X program, contacts with industries relevant to their research pursuits. Most of the faculty in H-STAR are in social science and humanities-affiliated departments (rather than engineering and research-equipment intensive disciplines such as physics), which do not have the extensive infrastructure needed to support the interdisciplinary research projects they wish to pursue.

The primary means for funding H-STAR research is external grants, secured by the faculty and researchers. The administrative and financial support staff of H-STAR provides help and support for faculty in proposal preparation and grant management. H-STAR also takes the initiative to secure large-scale, institute-level research funding that provides support to many institute faculty members when the opportunity arises. For example, in 2004 the LIFE Center (Learning in Informal and Formal Environments) was established as one of the first three national Science of Learning Centers (SLCs) in partnership with the University of Washington and SRI International. Following an NSF Site Visit in Summer 2008, the National Science Board approved an 18-month extension to the first five-year period ($25 million of funding) of the LIFE Center, with the prospect following a forthcoming site visit in February 2010 of an additional 42 months to comprise a full ten-year NSF-funded project period for the LIFE Center. This Center has funded faculty and students across education, communication, psychology and served as a tremendous interdisciplinary training ground for building capacity in the university for fundamental learning sciences research across schools and departments.

H-STAR supports and funds activities across the campus, but the main loci of research are in Wallenberg and Cordura Halls. H-STAR has its administrative offices in Wallenberg Hall and Cordura Hall. In Cordura Hall, in addition to three administrative offices, H-STAR has five multi-person offices devoted to research projects. SCIL is housed in Wallenberg Hall. Media X has two offices and an administrative staff workstation in Wallenberg Hall. An open area of the top floor of Wallenberg Hall is currently used by H-STAR and Media X to house some research projects (for limited periods of time).

4. Major programs within H-STAR

4a. *SCIL.* SCIL conducts scholarly research to advance the science, technology and practice of teaching and learning. It has a strong focus on the multi-disciplinary core of theory, research, and methods that are needed for world-class work on the central topics in learning sciences and technology design. Recognizing that the processes of knowledge creation, discovery and communication in the disciplines make continually deeper uses of technologies that are transforming the very nature of inquiry and scholarly practice, SCIL seeks to make transformative advances in learning and teaching with technologies by bringing together disciplinary faculty to work with experts in education and the sciences of learning as well as with leading designers and technologists.

4b. *Media X.* H-STAR's industry partnership program, Media X, is a self-funded program that seeds campus-wide research and coordinates industry interest. The program currently includes 16 industry partners. The program supports and funds research initiatives on domains involving people and technology, rather than by discipline. Since the program began in 2001, Media X has supported more than $2.9M of Stanford research, spread across over 80 Stanford faculty PIs, receiving over 200 proposals, representing faculty from all seven schools, and involving over 100 graduate students. Research funding from Media X has been in the form of seed grants to support early investigation of promising ideas that show likelihood of leading to larger projects. Media X research funds are open to all researchers in the Stanford community, and preference is given to novel interdisciplinary collaborations. Many of these "seed" funded projects leverage large federal and foundation grants (bringing faculty and student work closer to societal impact through commercial diffusion.) A significant number have led to new interdisciplinary proposals for federal and foundation grants that build on the Media X seed projects. (See *Section 10* for more details about Media X.)

4c. *WGLN III - Wallenberg Global Learning Network III.* The mission of WGLN is to help students achieve better learning outcomes, to support faculty investigators in producing new knowledge for best learning practices, and to develop pedagogic and technical solutions suitable for innovative use in a variety of university and pre-college settings. To achieve this mission, WGLN offers competitive faculty grants, awarded by an impartial faculty review panel from academic institutions in Sweden and the U.S. The funded projects represent close collaborations between Swedish and Stanford faculty, with the goal of improving teaching and learning. http://www.wgln.org/

WGLN I and II were established in 1998 and 2003, respectively, as part of a larger gift from the Knut and Alice Wallenberg Foundation, which helped create Wallenberg Hall's advanced resource classrooms, research space, and pilot projects around technology in the education.

The WGLN III program focuses exclusively on K-12 education and runs from Sept 2008 - August 2012. The final RFP for the program was issued in January 2009 for multi-year projects that involve a Sweden- Stanford collaboration that consists of four partners: a university-based research team in Sweden and one at Stanford and a team of K-12 schools in Sweden and in the U.S. The program awarded $2.05M USD to four projects. The award is divided between Stanford University, the Swedish university partner, and the partnering K-12 schools in the U.S. and Sweden – Stanford, in total, received $1.21M. The faculty PI and project names are as follows:

- David Epel. **Inquiry-2- Insight (I-2-I):** an international environmental collaborative project (*Biology*: environmental science, high school)
- Roy Pea. **LET'S GO** - Learning Ecology with Technologies from Science for Global Outcomes (*Biology*: ecology, middle school and high school)
- Dan Schwartz. **Talking and Seeing Math in Games** (*Math*: elementary education)
- Terry Winograd. **Wii Science**: Teaching the laws of nature with physically engaging video game technologies (*Physics*: middle grades)

The entirety of the WGLN III program amounted to $2.654M with $1.42M coming directly to Stanford University. For some projects, Stanford managed the award for the partnering U.S. schools.

There were 50 projects in the entire WGLN (I, II, III) program from 1998 – 2012. This is the longest program that the Wallenberg Foundation has ever financed. A summary of each project has been written which includes publications and follow-up comments collected from the PIs and project teams (June 2009). The Foundation has made it clear that there will not be a continuation of the WGLN program, but plans to initiate a new kind of networking collaboration with Stanford.

The WGLN Board of Directors includes Stanford Professor of Biological Sciences H. Craig Heller as Chair and Lund Professor of Linguistics Sven Stromqvist as Vice Chair. Other Board members include: Stanford Dean of the School of Education Deborah Stipek, former Stanford Dean of Research, Arthur Bienenstock, Professor Donald Kennedy of Stanford University, and Mr. Johan Stålhand and Professor Sture Forsén from Sweden.

4d. *CTEL/CLAD* The Stanford Online CTEL/CLAD Program is a pioneering new program of technology-enhanced learning, taught by Stanford faculty Hakuta and Valdez and operated by H-STAR. The program leads to the California English Learner Authorization, a professional K-12 teaching certificate required by the state for any teacher providing instruction for English Learners in California public schools.   CTEL stands for California Teachers of English Learners, and the state of California acronym CLAD stands for Cross-cultural, Language and Academic Development. The CTEL/CLAD program participants analyze videos of real practice in real classrooms, and engage in carefully selected readings through three online courses, to learn about the latest methods in teaching English language learners in addition to standards-based, content area learning. Students are introduced to education policy and the scientific fields of linguistics, human learning and anthropology as they pertain to English language learners. Since it began in 1999, CLAD has graduated some 866 teachers with the CLAD EL Authorization certification. The program has served over 85 school districts, the majority of which are in California.

Total number of program graduates to date: 866 students
Total number of enrollees to date: 1,072
Currently enrolled: 206
2009 Total enrollment: 412

Among the school districts served by the program are:

Los Angeles USD 75
San Francisco Unified School
District 52
Palo Alto Unified School District 38
Modesto City Schools 27
Long Beach Unified School
Districts 23
Stanford New Schools 16
Juneau (Alaska) School District 11
Oakland Unified School District 10
Atascadero Union High School
District 9
Liberty Union HSD 7

Lucia Mar USD 6
Morongo Usd 6
Ravenswood City School District 6
San Ramon Valley USD 6
Castro Valley Unified School
District 5
Fremont union high school district 5
Moraga School District 5
San Jose Unified School District 5
Santa Clara Unified School District 5
Santa Ynez Valley Union High
School District 5
Simi Valley Unified School District 5

5. Faculty and researchers in H-STAR

5a. *Core faculty members of H-STAR*

The following 11 Academic Council faculty carry out research wholly or principally within H-STAR:

1. Bailenson, Jeremy, (Department of Communication)
2. Barron, Brigid (School of Education)
3. Blikstein, Paulo (School of Education; courtesy, Computer Science)
4. Goldman, Shelley (School of Education)
5. Hagström, Stig (Materials Science and Technology)
6. Hakuta, Kenji (School of Education)
7. Nass, Cliff (Department of Communication)
8. Pea, Roy (School of Education; courtesy, Computer Science)
9. Reeves, Byron (Department of Communication)
10. Schwartz, Daniel (School of Education)
11. Valdés, Guadulape (School of Education)

5b. *Affiliated Stanford Faculty*

The following additional 32 Academic Council faculty have some research projects within H-STAR, or participate actively in one or more H-STAR programs. Those that have received research funding from H-STAR are marked with an asterisk.

1. Altman, Russ (School of Medicine)*
2. Bailey, Diana (Department of Management Science and Engineering)*
3. Berman, Russell (Department of Comparative Literature)
4. Bienenstock, Arthur (Wallenberg Research Link)
5. Carstensen, Laura (Department of Psychology)
6. Chafe, Chris (CCMRA)*
7. Clark, Herbert (Department of Psychology)
8. Cook, Karen (Department of Sociology)
9. Cutkosky, Mark (Department of Mechanical Engineering)*
10. El Gamal, Abbas (Department of Electrical Engineering)*
11. Guibas, Leonidas (Department of Computer Science)*
12. Hanrahan, Pat (Department of Computer Science)*
13. Heer, Jeffrey (Computer Science)
14. Heller, Craig (Department of Biology)
15. Hinds, Pamela (Management Science and Engineering)*
16. Iyengar, Shanto (Department of Communication)*
17. Klemmer, Scott (Department of Computer Science)
18. Koltun, Vladen (Department of Computer Science)*
19. Krawinkler, Helmut (School of Engineering)*
20. Law, Kincho H. (Dept of Civil and Environmental Engineering)*
21. Leifer, Larry (Department of Mechanical Engineering)
22. Levis, Philip (Department of Computer Science)*
23. Levoy, Marc (Department of Computer Science)*
24. Lewenstein, Marion (Emeritus, Department of Communication)
25. Lunsford, Andrea (Department of English)
26. Perry, John (Department of Philosophy)*

27. Salisbury, Kenneth (Depts of Computer Science and Surgery)*
28. Schnapp, Jeffrey T. (Stanford Humanities Laboratory)*
29. Wagner, Anthony (Department of Psychology)
30. Wandell, Brian (Department of Psychology)
31. Willinsky, John (School of Education)
32. Winograd, Terry (Department of Computer Science)

5c. *Stanford researchers in H-STAR*

The following 23 Stanford and Stanford associated researchers (the majority of whom are senior scholars with doctoral degrees) have a significant affiliation with H-STAR (an asterisk indicates that the researcher has received funding from H-STAR, mostly through Media X):

1. Barbagli, Federico (Computer Science)*
2. Bennetsen, Henrick (Stanford Humanities Lab)*
3. Chen, Helen (H-STAR)
4. Chin, Doris (H-STAR)
5. Devlin, Keith (H-STAR, CSLI)
6. Fern, Veronica (H-STAR)
7. Fogg, B.J. (H-STAR)
8. Frampton, Matthew (H-STAR)
9. Fruchter, Renate (Engineering)*
10. Go, Janet (H-STAR)*
11. Grossman, David (Center for Design Research)*
12. Charles H. House, Media X
13. Huang, Camillan (H-STAR)
14. Kunz, John (Civil and Environmental Engineering)*
15. Kwong, Henry (H-STAR)
16. Levitt, Raymond (Civil and Environmental Engineering)*
17. Martin, Caitlin (H-STAR)*
18. Rosen, Joseph (H-STAR)*
19. Rosenberg, Duska (Royal Holloway University, London)
20. Martha Russell, Media X
21. Van der Loos, H.F. Machiel (CDR)*
22. Varma, Sashank (H-STAR)*
23. Verplank, William (Computer Science and CCRMA)*

Much of the research carried out at H-STAR is conducted under faculty guidance by doctoral level researchers, postdocs, graduate students, and academic and industrial visitors who are based in Wallenberg or Cordura Hall.

6. International activity

H-STAR has several international activities, with ongoing academic and industrial research collaborations throughout Europe and Asia. The most significant today are listed below:

6a. *The Wallenberg Research Link*

Led by special assistant to Stanford's president for federal research policy (and former Dean of Research), Arthur Bienenstock, the Wallenberg Research Link serves as a contact center to initiate and support contacts with Swedish researchers, Swedish students and their counterparts at Stanford.

6b. *Baltic Research Partnerships*

Over the past four years we have developed several collaboration initiatives with a number of countries in the Baltic region, known for their world leadership role in the human-centered design of technology that forms a major component of H-STAR's research focus. In FY08, government technology agencies of Finland (TEKES) and Denmark (DASTI) funded Stanford's infrastructure costs in supporting research collaborations on the Stanford campus between university scholars from Finnish and Danish universities, working on projects with Stanford faculty PIs. The total associated infrastructure support received from these sponsoring agencies in FY09 was $365,000.

The Stanford faculty involved in these collaborations during 2008-09 were:

- Fred Turner, Dept of Communication
- Pamela Hinds, Dept of Management Science and Engineering
- Terry Winograd, Dept of Computer Science
- John Willinsky, School of Education
- Byron Reeves, Dept of Communication
- Roy Pea, School of Education
- Larry Leifer, Center for Design Research
- Karen Cook, Dept of Sociology
- Thomas Wasow, Dept of Linguistics
- Stig Hagström, SCIL
- Russell Berman, Dept of Comparative Literature
- Leonid Kazovsky, Dept of Electrical Engineering

6c. *Sweden*

In January 2008, H-STAR received a gift of $1.5M from the Swedish national innovation agency VINNOVA to found the VINNOVA-Stanford Center for Research on Innovation Journalism, housed in H-STAR. The gift was intended to fully support the new research center for the first eighteen months of its activities. Innovation journalism is reporting that covers how innovation happens. For Innovation Journalism the process of innovation itself is the central concept, treating business, technology, politics, etc. as nested components of a news story. In terms of traditional newsbeats, this approach is multidisciplinary, spanning across the old beats, reporting on innovation processes and innovation ecosystems. The director of the new center is Stig Hagström; the Executive Director is David Nordfors, who introduced the concept of Innovation Journalism and gave it its name in 2003.

6d. *Germany*

Several H-STAR researchers have strong links to colleagues at German universities. H-STAR faculty have also co-developed and participated in an international series of research workshops, funded by NSF in the USA and the DFG in Germany, on network-supported collaborative learning, which have led to joint publications and enriched mutual influences across a knowledge network of 10 American universities and 7 German universities (University of Cologne, University of Münster, University of Tübingen, Knowledge Media Research Center-Tübingen, University of Mannheim, University of Duisburg-Essen, University of Freiburg). One new journal, the *International Journal of Computer-Supported Collaborative Learning* (iJCSCL, published by Springer/Kluwer) was initiated as a result of these developments, and H-STAR Co-Director Roy Pea is on its Editorial Board. In addition, in recent years, Professor of Computer Science Wolfgang Effelsberg, from Germany's Mannheim University, spent a half-year sabbatical at SCIL, and was followed by postdoctoral fellow Dirk Farin and doctoral candidates Nicolai Scheele and Anja Wessels – all contributing actively to ongoing programs of H-STAR research. Finally, Roy has been collaborating with Professors Friedrich Hesse and Carmen Zahn of the large DFG-funded Knowledge Media Research Center in Tübingen, and a number of research publications and scientific conference symposia have developed from these collaborations, which is now a strategic partnership with the NSF LIFE Center.

6e. *Netherlands*

Philips Research Labs in the Netherlands joined Media X as an affiliate in 2004. In FY09, three researchers from Philips, with university affiliations in the Netherlands, spent periods of time at Stanford working with Stanford faculty. A two-day summer workshop was held to report results of this Stanford research, corresponding research at the Dutch institutions and at Philips Research. In 2009 a subgroup of one research team launched a new journal, the *Journal of Ambient Intelligence and Smart Environments*.

6f. *Taiwan*

Through SCIL, H-STAR developed a partnership with the Center for Learning Sciences and Technology at Taiwan's National Central University, invited by Center Director Professor Tak-Wai Chen and a delegation to Stanford including Taiwan's Deputy Director of the Ministry of Education. H-STAR co-Director Roy Pea advised Center Director Tak Wai-Chen in his formation of the G1:1 initiative, in which we are a partner. G1:1 is a global one-to-one computer to learner initiative with participation for over twenty countries, a devoted website to projects, results, tools and datasets, and a sponsor of over about a dozen conferences on the subject with professional societies such as IEEE. The aim is developing global collaborative research models on 1:1 personal (and increasingly mobile) computer learning (http://www.g1on1.org/). This partnership spawned the international conference on computer-supported collaborative learning (CSCL-05) in June 2005 at the Taiwan campus, with strong Stanford representation in leadership and paper presentations. The G1:1 network has spawned a large number of IEEE workshops on wireless mobile ubiquitous technologies for education (WMUTE) on which Chen and Pea and colleagues

from other nations have served on program committees, with WMUTE now a thriving interdisciplinary area of scholarship. Roy co-chairs the 6th IEEE WMUTE conference forthcoming in Taiwan April 2010, and will be presenting three papers with students and collaborators.

7. The LIFE Center

The National Science Foundation (NSF) is funding Science of Learning Centers (SLCs) in order to extend the frontiers of knowledge on learning of all types and create the intellectual, organizational, and physical infrastructure needed for the long-term advancement of learning research. The Learning in Informal and Formal Environments (LIFE) Center is potentially a ten-year research collaboration between the University of Washington in Seattle (College of Education, and Institute for Learning & Brain Sciences), H-STAR, SRI International and other partnering institutions, was one of the first four Science of Learning Centers to be funded, in the Fall of 2004. Following an NSF site visit in Winter 2010, the NSF and National Science Board will make their recommendations for the remaining period until 2014.

The purpose of the LIFE center (http://www.life-slc.org) is to develop and test principles about the social foundations of human learning in informal and formal environments, including how people learn to innovate in contemporary society, with the goal of enhancing human learning from infancy to adulthood.

The Center is engaged in many interdisciplinary studies of learning, incorporating diverse methodologies such as brain imaging, comparative experimentation, ethnographic inquiry and virtual reality. From its inception, LIFE Center research incorporated three academic traditions. LIFE's socio-cultural research tradition relied on ethnographic, interview, and survey methods to document the impact of culture and social activities on learning in and out of school. LIFE's experimental and neural studies used behavioral and neuroscience methods to document the mechanisms underlying social learning from a developmental and neural perspective, showing the deep reach of culture on the developing individual's mind and brain. LIFE's work on formal learning and technology examined teachable agents and learning in designed learning environments. LIFE's Center-mode work integrated these traditions into a set of six "Social Learning Drivers" that need to be taken into account in any transformative theory of the social foundations of human learning. Collectively, these six can be viewed as an integrative network of concepts that need to be explored separately and as an integrated whole in order to better understand social learning. The six are: (1) Imitation & Joint Attention, (2) Language, (3) Identity, (4) Guiding & Collaborating, (5) Choosing & Valuing, and (6) Simply Believing a Virtual Interaction is Social

LIFE has two Missions to achieve its Purpose:

- To identify and investigate underlying principles of how people learn socially by strategically sampling learning across settings, domains, and

ages, and by using multiple methodologies (neurobiological, cognitive, developmental, and socio-cultural) to spark conceptual collisions and syntheses among viewpoints.

- ▪ To foster research and education collaborations with individual and institutional partners, and to promote qualitative improvements, both theoretical and practical, in our collective capacities for understanding and supporting human learning.

Stanford faculty leading LIFE projects include LIFE leadership group Professors Roy Pea (Stanford Co-PI), Daniel Schwartz (LIFE Co-Director), and Co-Lead Brigid Barron, and contributing faculty Professors Jeremy Bailenson, Shelley Goldman, Anthony Wagner, Paulo Blikstein and Geoffrey Cohen. Over twenty doctoral students, postdocs and staff are involved in LIFE Center research work each year as well. The fifth-year budget for this project in FY09 was $1.42M, and additional grants make synergistic contributions to this encompassing project.

The LIFE leadership team consists of Brigid Barron, Philip Bell, John Bransford, Patricia Kuhl, Andrew Meltzoff, Na'ilah Suad Nasir, Roy Pea, William Penuel, Nora Sabelli, Dan Schwartz, Reed Stevens, and Nancy Vye. They are joined by an exceptional group of graduate students, post-doctoral scholars, faculty researchers, and staff in LIFE Center activities. The Center is directed by UW's Patricia Kuhl, Co-Director of the Institute for Learning and Brain Sciences (iLabs), and Co-Directors are Stanford's Dan Schwartz and UW's John Bransford.

8. Community outreach

Research with local schools and teacher preparation

H-STAR faculty and students are active in conducting research on learning, teaching, and new technologies with partnerships that take them into public schools from elementary to high school, from Redwood City and East Palo Alto to San Francisco, Palo Alto and beyond, to charter schools, as well as in after-school clubs and community centers. H-STAR faculty are also actively involved in contributing to SUSE's teacher preparation programs, the Teachers for a New Era initiative jointly funded by the Carnegie Corporation and the President's Office, and are engaged in planning and pursuing the campus-wide "K-12 Initiative." Several H-STAR faculty have been conducting Stanford K-12 Initiative-funded projects (Barron; Goldman; Lunsford; Pea; Schwartz; Wineburg).

Continuing and professional education.
Chuck House and Martha Russell co-taught "The Secret Sauce of Innovation" via Stanford Continuing Studies in Autumn 2008.

Chuck House co-chaired IMMERSCOM 2009 at the University of California at Berkeley with Professor Rusina Bajcsy.

Martha Russell co-chaired Publications of the International Symposium on Workshop on Computer Science and Engineering, WCSE 2009, Qingdao, China, Oct. 2009.

Martha Russell serves on the Editorial Boards of the *Journal of Electronics* and the *Journal of Interactive Advertising* and on the Program Committee of PERSUASIVE 2010 - The Fifth International Conference on Persuasive Technology.

The Summer Institute at Wallenberg Hall

In July-August-September of 2009 we held the sixth Summer Institute at Wallenberg Hall, a multi-week program for researchers and practitioners to explore the important issues at the crossroads of learning, physical space and technology. The purpose of the Institute was public outreach and education, as well as the development of new contacts and collaborative relationships. In addition, we view the Summer Institute as a potential source of revenue for faculty and program support. Most of the courses are co-directed by a Stanford researcher and a colleague from a collaborating institution.

The 2009 Institute consisted of seven courses, providing deep level subject matter to roughly 200 attendees.

July 20-21	***Social Connectedness in Ambient Intelligent Environments***
	Cliff Nass (Stanford) and Boris de Ruyter (Philips)
Aug 3-4	***Social Media Collaboratory***
	Howard Rheingold (Stanford)
Aug 4-5	***New Metrics for New Media: Analytics for Social Media and Virtual Worlds***
	Martha Russell (Stanford) and Marc Smith (Connected Social Action)
Aug 6	***Media and Management: Bridges for Head-Heart Impact***
	Neerja Raman (Stanford)
Aug 10-11	***Data Visualization: Theory and Practice***
	Jeffrey Heer (Stanford) John Gerth (Stanford) David Kasik (Boeing)
Aug 12	***Technology Transfer for Silicon Valley Outposts***
	Chuck House (Media X) and Jen Marc Frangos (BT)
Aug 12-14	***Visualization for Collective, Connective & Distributed Intelligence***
	Jeffrey Heer (Stanford) Bonnie DeVarco (Stanford) Katy Borner (Indiana University)

Media X Innovation Workshops

Media X collaborated with industry groups and business-oriented international government-sponsored innovation organizations in offering half-day and one-day programs on communication technology and Innovation for their delegates:

- Ambrosetti, Italy (recommended by President John Hennessy)
- Astrobiology Institute, NASA

- Danish Distance Selling and E-business Association, Innovation Center Denmark
- European School of Management
- Finnish TIVIT Innovation, TEKES
- International School of Management and Design
- Malaysia Industrial Development Authority
- McGraw-Hill Women's Forum, San Francisco, CA
- New York City Economic Development, Media Labs Program
- Project Management Institute Conference, Stanford
- World Economic Forum, Stanford

10. Wallenberg Hall

H-STAR has principal responsibility for the research and research-related activities that take place in Wallenberg Hall, a facility funded (by the Swedish Wallenberg Foundation), designed and built explicitly to enable research into different forms of education, taking advantage of new technologies and flexible, novel architectural features, and paying particular attention to international educational initiatives and collaborations. Wallenberg Hall has (thus) become a locus of activity for at least three distinct constituencies: faculty and students at Stanford University; researchers located at Stanford, in Sweden, and beyond (e.g., H-STAR affiliated faculty, Media X, LIFE Center collaborators, and WGLN projects); and a global array of industrial, commercial and academic enterprises with interest in the intersections between Silicon Valley and Stanford. It serves both as an H-STAR research medium, and to mediate teaching across states and international boundaries.

For *faculty and students at Stanford*, Wallenberg Hall is a place to explore and use advanced technologies for teaching and learning. For at least 12 hours most days, teachers and students take advantage of Wallenberg's state-of-the-art spaces to enhance learning in a multitude of ways. Video conferencing, in-class laptops, Stanford-developed collaborative iRoom software and DIVER Video Tools, reconfigurable furnishings and multiple Webster "interactive" boards provide some of the tools and both physical and representational infrastructure in the rooms that helps make good teaching even better.

Since September 2002, Wallenberg Hall has played host to more than 516 regular Stanford courses in more than 30 academic disciplines as well as to the University's Program in Writing and Rhetoric. For many Stanford faculty and students, Wallenberg Hall has become an indispensable tool for doing the work of education better, faster, and in newly transformative ways than is possible elsewhere on campus. The additional benefit of these users from the perspective of the research and development community is that they demand that the technology work *now*, and that it work to support learning activities. H-STAR is the organization that supports the technology staff that makes

Wallenberg Hall work, and that guides research that evaluates technology innovations used in the hall.

For *researchers at Stanford, Sweden, and elsewhere*, Wallenberg Hall is a workplace and a laboratory for explorations in the application of technology to learning. On the fourth floor of Wallenberg Hall, H-STAR provides support to faculty-led research projects funded by the NSF, WGLN and other funding agencies such as the Mellon Foundation, National Endowment for the Humanities, and other private foundations and corporate sponsors.

For *industrial, commercial, and academic enterprises* with interests in education and technology, Wallenberg Hall provides a gateway to Stanford's remarkable resources as a world-class university located in the world's most fruitful incubator of technological innovation. We continue to attract globally distributed visitors to learn about our ideas, methods, findings, technologies and teaching. H-STAR faculty and staff were instrumental in helping plan the new learning technology facilities at Stanford's Medical School, among many other efforts in the US and abroad. These visits are consequential in many ways: (1) as an efficient method for communicating to colleagues and decision-makers results from the research and the teaching that we support; (2) as providing potential collaborators for multi-institutional and international projects; and (3) in providing Stanford researchers with opportunities for scholarly exchanges about current thinking about technology and education in a concrete context of demonstrations. We continue to find Wallenberg Hall to be a vibrant hub for attracting and sustaining a far-flung network of researchers and practitioners in the U.S., Sweden, and elsewhere.

For the *campus community* as a whole, Wallenberg Hall provides ideal facilities and support for special events. H-STAR administers the staff that makes these events possible, many of which involve complex logistic planning and execution. Among the many varied activities that took place in Wallenberg Hall during FY08 (often with support from Wallenberg Hall staff) were:

Sept 08	Sophomore College
9-Sept-08	Stanford Teacher Center Seminar
10-Sept-08	Bill Lane Center for the American West, Speaker event
16-Sept-08	Stanford Publishing Meeting
Repeating	Stanford Webmasters Meetings
26-Sept-08	Lively Arts Retreat
2-Oct-08	Vice Presidential Debate (televised)
3-Oct-08	Faculty Development event – 'FitCom'
7-Oct-08	Media X Lecture Series – Kristian Toming
8-Oct-08	Hutcheon Lecture (David Palumbo-Liu)
9/10-Oct-08	Reunion Homecoming tours and 'Classes Without Quizzes'
10-Oct-08	Michael Preysman Speaker Event
14-Oct-08	GreenTech Speaker Event
15-Oct-08	Presidential Debate (televised)
20-Oct-08	Drama Department Job Search Video Conferences
20-Oct-08	University of Nebraska, Lincoln
21-Oct-08	PAC10 Video Conference
22-Oct-08	Pre-Law Speaker Event

23-Oct-08	Video Conference for Christina Reisselman to GNG (5:30am)
23-Oct-08	AICCU Meeting (Larry Horton)
23-Oct-08	Media X Lecture Series – Joshua Rosen, iLeonardo
27-Oct-08	PAC10 Video Conference
27/28-Oct-08	Innovation Journalism hosts Lemniscaat School of Mgt, the Netherlands
28-Oct-08	Microsoft TechFest
30-Oct-08	Dolores Hayden Lecture (Building Suburbia)
31-Oct-08	Wallenberg Hall Faculty Lunch Meeting
3-Nov-08	Wallenberg Hall Brown Bag Briefing
4-Nov-08	Media X Lecture Series – Vidar Hepso & Felicia Brych
4-Nov-08	Election Night Special (televised)
6-Nov-08	University Communications Meeting
6-Nov-08	Media X Lecture Series – Brian Sathianathan
7-Nov-08	Inequality Workshop
7-Nov-08	Swim Team Recruitment Event
11-Nov-08	Bill Drayton Speaker Event
11-Nov-08	FUSION Reception Dinner in honor of Bill Drayton
13-Nov-08	HumBio Internship Faire
14-Nov-08	Open Source Lab Unconference
18-Nov-08	Program in Writing & Rhetoric Open House
19-Nov-08	Introduction to the Humanities Open House
20-Nov-08	Stanford Institute for Creativity and the Arts (SiCa)Speaker Event
20-Nov-08	Media X Lecture Series – Artie Bienenstock
2-Dec-08	TheaterWorks Event (Vered Shemtov)
2-Dec-08	Spatial History Project Final Presentations
2-Dec-08	Cliff Nass CarLab/ChIME Reception Event
4-Dec-08	Faculty Affairs meeting
4-Dec-08	Media X Lecture Series – Zann Gill
4-Dec-08	Media Psychology Final Presentations
5-Dec-08	Lively Arts Speaker Event – Martin Matalon
8-Dec-08	Painting Job Search Video Conference Interviews
8-Dec-08	Media X Seminar – John Sowa
8-Dec-08	Scott Klemmer – Final Presentations
9-Dec-08	Doug Engelbart – 40th Anniversary of the Mother of all Inventions speech
10-Dec-08	Stanford Staff Leadership Development Program workshop
10-Dec-08	President and Provost's Office Finance and Human Resources Meeting
11-Dec-08	SiCa Speaker Event
12-Dec-08	San Francisco Ballet – Nutcracker shown in Theater
20-Jan-09	Inauguration Ceremonies (televised)
20-Jan-09	University Womens Group Speaker Event
27-Jan-09	ASTRA Board Meeting
28-Jan-08	Media X Seminar – Ike Nassi
29-Jan-08	Video Conference for ScanCor Visiting Scholar (6am)
31-Jan-08	Let's Go Workshop – Roy Pea (Saturday)
4-Feb-09	Lively Arts Advisory Committee Meeting
4-Feb-09	Media X seminar Jerome Glenn
6-Feb-09	K12 initiative meeting
6-Feb-09	Innovation Journalism (InJo) Video Conference
6-Feb-09	K12 PI Luncheon and Review
6-Feb-09	InJo Reception for 2009 Fellows
7-Feb-09	High School Debates
9-Feb-09	Konica Minolta Media X Focus Day
11-Feb-09	Pearson Media X Focus Day
13-Feb-09	Forum for Undergraduate

13-Feb-09	Heidy Maldonado/Roy Pea and Pasco Scientific demo to Redwood City schools
18-Feb-09	Media X Seminar Cark Hewitt
20-Feb-09	ASES VC3 Event 2009
22-Feb-09	Social Entrepreneurs Day
24-Feb-09	Media X Seminar
27-Feb-09	Parents' Weekend Tours
28-Feb-09	Parents weekend Tours
4-Mar-09	H&S Dean's Office meeting
4-Mar-09	Media X Seminar Mehran Bageri
4/5/6-Mar-09	Auditions
6-Mar-09	LIFE Video Conference to UWashington
6-Mar-09	SiCa/Lively Arts Meeting
15-Mar-09	Lively Arts Performance
16 Mar-09	Media X Visiting Scholars Workshop
16-Mar-09	High Performance Computing Meeting
18-Mar-09	Media X Seminar - Jari Multislta
18-Mar-09	School of Medicine Workshop
30-Mar-09	European Research Polices
30-Mar-09	Scandinavians at Stanford
30-Mar-09	President/Provosts Admin Meeting
30-Mar-09	Scandinavians at Stanford Reception
1-Apr-09	Discover Stanford - presentation
3-Apr-09	Discover Stanford – presentation
3-Apr-09	Tamalpais School District tour and meeting
3-Apr-09	Sociology Admit Weekend - Faculty Presentations
6-Apr-09	ASES Summit
6-Apr-09	Luncheon Party for Vinnova
8-Apr-09	SiCa Lunchtime Presentation
8-Apr-09	Cross-Cultural-Rhetoric Video Conference
9-Apr-09	ASES Summit
9-Apr-09	MS&E Video Conference
10-Apr-09	ASES Summit
13-Apr-09	Media X Seminar Bruce Damer
15-Apr-09	Zvisiei Sandi VC to Indiana
16-Apr-09	Kind of Blue Lively Arts film showing
17-Apr-09	President Hennessy meeting with French Ministers
17-Apr-09	Cliff Nass – Meeting with Nokia
17-Apr-09	Wallenberg Faculty Lunch
20-Apr-09	Media X Seminar John D. Evans
21-Apr-09	Queensland Univ. of Technology – Vice Chancellor, tour and meeting
23-Apr-09	Shoshana and Martin Gerstel Conference Fund Sympioaium
24-Apr-09	BASES Judging Event
27-Apr-09	Media X Seminars Eric Vatikiostis
29-Apr-09	Alyssa O'Brien's Class Final Presentations
30-Apr-09	Silicon Valley Innovation Institute Event
1-May-09	IHUM Research Collqium w/Reception
2-May-09	Mecha Chicano movement at Stanford video and brunch
4-7-May-09	Stan Shakes Rehearsals for King Lear
4-May-09	VC with Uppsala
5-May-09	Tom Kealey Art Student Presentations
7-May-09	Tina Seelig Mayfirld Fellows Lunch
12-May-09	Sue Dutra Meeting –OGC
12-May-09	Maria Magazine Writing Class
13-May-09	SiCa

13-May-09	Media X Seminar Haari Oinas
14-May-09	Byron Reeves meeting with Finnish Delegation
18-May-09	Media X Seminar Bonnie DeVarco
19-May-09	Duoc University, Chile – tour and meeting
22-May-09	SoCo Training Orientation
22-May-09	HumBio Honors Students Poster Presentations
26-May-09	Media X Seminar Resetting Assumptions for Distance Collaboration
27-May-09	SoCo Training Session
28-May-09	Concert Hall Meeting
28-May-09	Sven Otto Littorin Speaker Event
29-May-09	Henrik Bennesten Metaverse U After Conference Event
3-Jun-09	Bing Connection to SIW
4-Jun-09	GEM Final Presentation using Plycom VC
5-Jun-09	Software Faire
8-Jun-09	GEM Video Conference
9-Jun-09	Janeen Giusti Concert Hall Meeting
10-Jun-09	Presentations Tiang Lim Foo
11-Jun-09	Concert Hall Meeting
11-Jun-09	Danish Minister's Visit
16-Jun-09	Clayman Institute for Gender Research event
17-28 June-09	Larry Friedlander/MFA
17-Jun-09	Laurie K12 Steering Committee
18-Jun-09	Media X meeting with Danish Business Group
June thru Aug 09	Summer Institute at Wallenberg Hall events
6-8-Jun-09	GSB Summer Institute Big Picture Acivity
9-Jul-09	Kristen Blair- PhD Oral Defense
15-Jul-09	MultiTasking Workshop/Conference
22-Jul-09	Concert Hall Meeting
27-Jul-09	SUSE's Summer Institute Event
29-Jul-09	Cammy Hung Office of Science Outreach Tech Session
29-Jul-09	Concert Hall Meeting
30-Jul-09	SUSE ConnectEd Event
3-Aug-09	SiCa Concert Hall Meeting
6/7-Aug-09	Queensland University of Technology Workshop on Learning Space Design
10-Aug-09	Concert Hall Meeting
30-Aug-09	SoCo Training Day
31-Aug-09	SoCo Media Trainning
31-Aug-09	Faculty Affairs Meeting

In addition we have been pleased to host, on multiple dates:

- Videoconference connections for PAC10 Meetings, various PhD Oral Defenses, Woods Institute, Residential & Dining Enterprises, Concert Hall Planning Meetings,
- Job searches for Drama, Art, Sociology, and the Dean of Research
- Research user testing studies for various non-Wallenberg students
- Auditions and rehearsals for Stanford Shakespeare Society
- Meetings for Stanford Student Groups, including: Forum for American-Chinese Entrepreneurs (FACES), ISIS, Green Dorm Project, Brainstorming India, Scandinavians at Stanford, Fusion, Blyth Fund
- President and Provost Faculty Workshops/meetings

10. Media X Industry Partners Program

The Media X program is staffed by Executive Director, Charles (Chuck) House (a well known leading Silicon Valley executive and entrepreneur), and Associate Director, Dr. Martha Russell. During the past six years 90 Stanford professors have submitted research proposals for Media X funding.

Due to the economic situation, the Media X Annual Meeting was replaced with themed round table meetings and workshops.

In February, Media X co-sponsored with Accel Partners a one-day symposium, *The Delta Conference: The Impact of 2008's Dramatic Events on the World of Digital Media and Technology.* This meeting was attended by over 250 professionals from media, venture, and academic organizations.

The Media X Seminar Series was continued in 2009, sponsored in Winter 09 by SAP and in Spring 09 by Sun Microsystems, with 20 seminars given by academic and industry researchers. During Fall 09, eight seminars were co-sponsored with other Stanford and Bay area organizations.

Video recordings of Media X Seminars are available online for viewing by the public. Media X created an official Collection of seminar and workshop videos in the Internet Archive.

- Kristian Torning, Danfoss - "Motivating Knowledge Sharing in a Global Enterprise" *Co-sponsored with Innovation Center Denmark, Silicon Valley*
- Kentaro Toyama, Microsoft Research - "Computing for Socio-Economic Development" *Co-sponsored with CHIme, IEEE, HCI Research, Stanford India Association*
- Joshua Rosen and Kirk Chen, Justvote.org - "Knowledge Sharing to Energize Voters" *Co-sponsored with Stanford Humanities Lab*
- Vidar Hepso, StaOil, and Felicia Byrch, Cisco - "Enabling Innovation Through Collaboration Technologies" *Co-sponsored with Center for Integrated Facilities Engineering*
- Brian Sathianathan, Avot Media - "Video in Your Pocket" *Co-sponsored with Persuasive Technologies Lab*
- Artie Bienenstock, Stanford University - "The New President and Science Policy" *Co-sponsored with Stanford Program on Regions of Innovation and Entrepreneurship* December 4, 2008
- Zann Gill, DESYN Lab - "Nine ECO-logical design principles for multi-agent innovation networks" *Co-sponsored with Stanford Human-Computer Interaction Group*
- John F. Sowa and Arun K. Majumdar, VivoMind Intelligence, Inc. - "Pursuing the Goal of Language Understanding" *Co-sponsored with Symbolic Systems*
- Katy Borner, Indiana University, Communicating the Structure and Evolution of Science
- Keith Klemba, SAP, Business Network Transofrmation - Telepresence

- Jerome Glenn, The Millennium Project, <u>Ten Years Hence: Clear Voice for Science</u>
- Carl Hewitt, Emeritus MIT EECS, <u>Semantic Integration in Privacy-friendly Client Cloud Computing</u>
- Dragan Boscovic, Motorola, <u>Dynamic Radio Interference Maps in the Context of Edge Networking</u>
- Jari Multisilta, University of Tampere, <u>Next Generation Web for Network-based and Mobile Learning</u>
- Bruce Damer, Contact Consortium; DigitalSpace, <u>The EvoGrid: Building a Precursor Artificial Origin of Life Simulator"</u>
- John D. Evans, John D. Evans Foundation and Doug van Houweling, University Corporation for Advanced Internet Development (Internet2), <u>Freedom, Science, Innovation, and Spirituality in the Digital Age</u>
- Parvati Dev, Innovation in Learning, Incorporated, <u>Learning and Work in Networked Virtual Worlds</u>
- Kristian Kiili, Tampere University of Technology, Information Technology, Finland and a Visiting Scholar at Stanford University, <u>Game-Based Learning Demystified</u>
- Harri Oinas-Kukkonen, University of Oulu, Finland, and Visiting Scholar, H-STAR institute, Stanford University, <u>PSD: A Model for Persuasive Systems Design</u>
- Bonnie DeVarco, Media-Tertia, <u>Visualization Convergence for Collective, Connective and Distributed Intelligence</u>
- Shuhua Liu, Academy Research Fellow of the Academy of Finland and visiting scholar at H-STAR Institute, Stanford University, <u>Understanding the Global Economic Crisis: A Text Analysis and Summarization Approach</u>
- Ann Bamesberger, Sun Microsystems (panel leader), with Casey King, CTO of LifeSize Communications; Matt Collier, SVP of Corporate Development of LifeSize Communications; and Ross Mayfield, Founder/President/Chairman of Socialtext, <u>Resetting Expectations for Distance Collaboration</u>

Five Focus Days (in-depth brainstorming sessions with Stanford faculty and industry researchers from a member organization) were held in 2009 on themes of:

- Informal Video Collaboration
- Social awareness and presence in lifestyle communications with a focus on wellbeing, coaching & monitoring
- Distributed IP-centric control and signaling software platform for enabling mobility and control of content, communication, and context across multiple domains
- The future of technology and the impact on convenience retailers
- Adolescents and their media consumption habits as individuals with respect to motivation, convenience, expectations, happiness.

Follow-up activities between industry members and the faculty members who attended the intimate, in-depth discussions about issues of common concern

during the Focus Days have led to faculty speaking engagements, hiring graduating students, expanded Media X member relationships, and collaborative submission of proposals.

Media X hosted a 2009 Industry Visiting Scholar from Konica Minolta, Japan, whose on-campus activities spanned Libraries, Computer Science, and Electrical Engineering and focused on the use of virtual worlds for business teams. An additional Visiting Scholar from Konica Minolta is expected in February 2010. The visits of these researchers are preliminary to establishing a collaboration between Konica Minolta and Media X.

In FY09, three researchers from Philips, with university affiliations in the Netherlands, spent periods of time at Stanford working with Stanford faculty. These three visiting researchers will return in 2010.

Media X also hosted ten Media X Distinguished Visiting Scholars during 2009. These Scholars were active in giving presentations and seminars, contributing to proposal development and meeting with existing and potential Media X members.

Two new Affiliate and four new Associate Members were added in 2009. In 2009 several Affiliate Members reduced their membership level to Associate Membership. Previous Media X members continue to be involved in seminars and meetings. The total income from membership fees for FY08 was $675,000. The bulk of this money was used to run the program and support faculty research. Media X members in 2009 include:

Affiliate Partners ($50K per year)
- Cisco (San Jose, CA)
- Konica Minolta Technology USA (Fremont, CA)
- Pearson (New Jersey)
- Philips (Eindhoven, Netherlands)
- Sun Microsystems (Mountain View, CA)

Associate Partners (<$25,000 or in kind support)
- Accel Partners (Palo Alto, CA)
- Association of Convenience and Petroleum Retailers, NACS, (Washington D.C.)
- Connected Social Action (Burlingame, CA)
- DNP (Tokyo, Japan)
- Forterra (San Mateo, CA)
- FXPAL (Palo Alto, CA)
- Hewlett Packard (Palo Alto, CA)
- KenesisSurvey (Austin, TX)
- Motorola (USA)
- NCast (Mountain View, CA)
- SAP Labs (Palo Alto, CA)
- Teknowledge (Palo Alto, CA)

- Teleplace (Palo Alto, CA)

Media X continues to broaden the intellectual exchanges for the campus through funding and collaboration opportunities, as well as through seminars and Focus Days. Media X is aggressively pursuing both new partner development activities and related faculty interests.

Plans for outreach and cultivation in 2010 include the continuation of the Media X Seminar Series, a fall meeting co-sponsored with Accel Partners, and five or more workshops in conjunction with the Summer Institute at Wallenberg Hall.

11. Affiliated Masters and Doctoral Programs: LSTD and LDT

In late 2001, H-STAR co-Director Roy Pea collaborated with colleagues in the School of Education (SUSE) and elsewhere on the campus to establish an interdisciplinary doctoral program in Learning Sciences and Technology Design (LSTD), which now has a cohort of approximately 30 full-time students. These students are active in H-STAR Institute research activities, commonly found on the 4th floor of Wallenberg Hall, and are typically funded by H-STAR and Media X faculty research grants. A related program, established by SUSE in 1997, is Learning Design and Technology (LDT), with an engaging project-focused curriculum that attracts 18-20 masters' students for its full-year duration. Together, the LSTD (PhD) and LDT (MA) programs provide a vital "people" contribution to the interdisciplinary research, teaching, and apprenticing activities of the H-STAR Institute. Many of the students convene in the technology and video resource enabled workspaces of Wallenberg Hall for conducting their work activities, meetings with faculty and one another, and for group analysis of videorecordings associated with their research studies.

12. Plans for the future

Our primary goal is to continue to secure research grants to support and develop the institute's research activities. The recent renewal of the major NSF LIFE Center award is a good indicator of the strength of the institute.

October, 2009 saw the announcement of $6.27 in research funding to H-STAR to carry out a two-year project to find ways of using technology to increase energy efficiency across the nation. The project is led by Byron Reeves, and seeks to develop an interactive software system that encourages people to be more energy efficient at home. The funding includes $4,992,651 from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) and about $1.28 million in matching grants from Stanford and the California Energy Commission.

We anticipate continued growth in our international research partnership activity, in particular the current Baltic Research Partnerships (Finland, Denmark, and Sweden, with the anticipated addition of Estonia). These are funded by government research agencies charged with promoting long-term technology

growth, and are thus less impacted by changes in economic climate.