

# Special Emphases

## Introduction

Northeastern coordinated the self-study process of this reaccreditation review with a University-wide planning process. The planning process honed the new mission statement, explained in *Standard One: Mission and Purposes*, in concert with developing a wider academic strategy for the University. The process that led to the Academic Plan was broad and participatory and included members of the faculty, the staff, and the student body.

The 2007 Academic Plan identified five major strategic themes: enhancing student outcomes through experiential learning, addressing global and societal challenges through interdisciplinary and translational research, enriching intellectual life and creative expression, strengthening urban engagement, and embracing global opportunities.

This self-study selects two of these strategic themes for special emphasis: Experiential Learning and Interdisciplinary and Translational Research.

These two broad themes map directly onto the new mission statement:

*To educate students for a life of fulfillment and accomplishment*

*To create and translate knowledge to meet global and societal needs*

Northeastern has always grounded its educational model in the application of theory to practice. For a century it has been known for its cooperative education plan, and indeed the University is an acknowledged world leader in this field. In recent years the University has expanded its educational model beyond traditional cooperative education to embrace a wider variety of out-of-classroom learning experiences as complements to the classroom experience. Experiential education at Northeastern is a transformative process of situated exploration, in the world of work or the world at large, which is extensively integrated with classroom learning.

Northeastern's deep commitment to experiential education is matched by its commitment to the value of interdisciplinary and translational research in addressing global and societal problems. These problems are often too complex and too interconnected to yield to a single approach. Research groups at Northeastern partner with government agencies, private industries, hospitals, non-profit organizations, community agencies, and other universities to accomplish larger goals than would be attainable by the academic community working in isolation. Northeastern's research culture values the creativity and innovation generated when the perspectives and expertise of different arenas of practice come together.

The University's investment in interdisciplinary and translational research enhances the value of a Northeastern education. The ability to think across boundaries and work within multidisciplinary teams is becoming a highly valued skill in the marketplace. Universities that offer opportunities for students to acquire this expertise are educating the leaders of the future. Northeastern's distinctive research culture also takes advantage of the technological advances that have made research increasingly global and collaborations increasingly international. Research colleagues

who may never meet face to face can now work together to collect and analyze data, commercialize intellectual property, or develop a strategy for marketing a new product.

As the two areas of emphasis in the Self-Study will underline, Northeastern's new Academic Plan is built upon the strong foundations that have sustained the University throughout its history.

Experiential learning is rooted in the highly developed and very successful cooperative education program. Interdisciplinary and translational research is an extension of the collaborative, innovative, and entrepreneurial research that has characterized Northeastern since the 1960s.

## Experiential Learning

### *To educate students for a life of fulfillment and accomplishment*

Experiential education at Northeastern University is a transformative process of situated exploration, in the world of work or the world at large, which is extensively integrated with classroom learning. In this process the student plans carefully, observes closely, and engages critically with the workplace, another social setting beyond the university campus, or the global community. This experience empowers students to achieve authentic real-life outcomes by means of critical analysis, enlightened synthesis, and the application of skills acquired by means of a rigorous education that connects theory with practice. A meaningful context unites learning and experience. These real-life outcomes enrich learning and prepare graduates to answer important questions. They also equip students to solve problems and clarify values.

If integrated experiential education is anything in a community of scholars, it is transformative. Students take charge of their own education in the classroom and beyond. Self-directed learning, individually and in teams, provides a foundation for mature, passionate, and confident lifelong learning. When students enter and leave “communities of practice” (in Etienne Wenger’s phrase), they form and become aware of their individual identities as participating pre-professionals in those communities of practice and build meaning in their lives in a way that didactic classroom learning alone is unlikely to achieve.

Rich experiential education also transforms the campus environment. After nearly 100 years of pioneering work in cooperative education, and after a recent sharp rise in national recognition based on a growing reputation for academic excellence, Northeastern is becoming an acknowledged leader in American higher education at large, not just among institutions professing cooperative education. Experiential education, with a strong core of cooperative education, provides Northeastern and its students with a competitive advantage. Experiential education provides students with both latent benefits of personal growth, such as self-confidence and improved self-knowledge, and manifest benefits, such as improved critical thinking skills and deeper knowledge of academic subject matter as well as professional competencies.

Since the inception of cooperative education, it has been a hallmark of the undergraduate experience at Northeastern, and the work experience that students undertake while on co-op had until recently been synonymous with “experiential learning.” While cooperative education has not been a graduation requirement in most majors, the great majority of Northeastern students participate in at least one cooperative education opportunity, and in numerous majors virtually all students complete one to three cooperative education experiences. In recent years, especially in the College of

Arts and Sciences, students have increasingly engaged in forms of experiential learning in addition to cooperative education, including research, service learning, internships, and study abroad. This expanded range of opportunities has enriched the exploratory value of experiential education; through placements in various kinds of jobs and organizations, students can explore their options more fully and learn where their passions lie.

Experiential learning and its integration with academics and research are essential to the future strength of Northeastern. Students are and will continue to be attracted to Northeastern because of the academic excellence of its curricula and the integration of academic curricula with experiential learning. They will stay because of the quality of those experiences on campus, in the community, in the workplace, and around the world. They will graduate uniquely prepared to make life-long contributions to learning, theory, and practice.

At the time of the 1998 accreditation study, Northeastern had recently (1995) adopted its first University-wide statement of general education objectives, known as the Academic Common Experience (ACE). ACE focused on aspects of development that all students should undergo as part of their experience. Within ACE, there was no University-level “experiential learning” requirement *per se*, although the College of Arts and Sciences instituted such a college-level requirement for all of its students. The ACE framework recognized experiential activities as important paths of student development in a number of the ACE areas.

In Spring 2006 the Faculty Senate approved the adoption of a University-wide general education curriculum (the NU Core), which for the first time included a University-wide experiential learning requirement — calling for an experience with a reflective dimension — and a requirement that experiential learning be integrated into the academic curriculum at multiple points throughout every major. ([http://www.facultysenate.neu.edu/committees/20052006/special\\_committee/documents/APCFinalRpt41206.pdf](http://www.facultysenate.neu.edu/committees/20052006/special_committee/documents/APCFinalRpt41206.pdf))

Northeastern’s expectations for experiential learning reflect the mission and character of the University. The currently available programming ensures that students have systematic, substantial, and sequential opportunities to learn important skills, develop understanding, and actively engage in important problems of their discipline or profession. It provides students with regular and constructive feedback designed to help them consistently improve.

For many students, participating in cooperative education will continue to be the way they approach the “experiential” component of the Core requirement. Demand for cooperative education placements remains high at Northeastern, with 89 percent of Northeastern undergraduate students completing at least one cooperative education experience. Across the colleges, undergraduate participation in cooperative education ranges from 76 percent to 100 percent.

Additional pathways for fulfilling the experiential requirement include, among others, undergraduate research; international experience, whether in study abroad or international cooperative education placement; service learning; and participation in departmentally focused student arts and media productions.

The capstone component of the general education program, which provides the ultimate, senior-level opportunity for students to draw together the three major threads of their curriculum — major courses, general-education courses, and out-of-classroom learning opportunities — draws

on earlier, guided opportunities to link concepts learned across courses in the major, between major and general-education courses, and between cooperative education or other experiences.

Northeastern's new core capitalizes on the three-tiered Integrated Learning Models (ILM's) in each major that were developed during semester conversion. Every major's ILM incorporated some form of experiential learning into the academic curriculum at three points of a student's progress through the major: before the first experience-based learning opportunity, during or immediately following the initial opportunity, and near graduation as a reflection on the role the experience-based component of their education played in their overall development as learners.

While cooperative education has been and continues to be the mainstay of experiential learning at Northeastern, service learning, international study, and student research are all gaining students' attention as experiential complements to their classroom work. Between 2002 and 2006, for example, the percentage of Northeastern freshmen reporting an interest in service learning opportunities rose from 18.8 percent to 24.8 percent in 2006, while the percentage interested in study abroad rose from 26.1 percent to 36.3 percent (Higher Education Research Institute – Cooperative Institutional Research Program [HERI – CIRP] Freshman Survey). Interest in Northeastern's growing range of experiential opportunities is strong at all levels of the student body. In 2006–07, undergraduate and graduate student participation in some form of experiential learning was substantial, with 7,850 undergraduate students (out of 15,250) and 1,085 graduate students (out of 3,298) participating in these four broad areas of experiential learning.

Opportunities for international experiential learning are expanding rapidly at Northeastern. In the past two years, undergraduates have pursued experiential learning activities in 88 cities in 46 countries. New international cooperative education placements are being developed with the help of Northeastern's alumni body and broad base of multinational corporate employers. To build long-term, reciprocal partnerships with institutions around the globe, a new position, Vice Provost for International Affairs, was created in 2007.

As both the University and its students increasingly emphasize research, placements in research-based cooperative education positions and participation in research — in the form of courses, honors theses, work-study assignments, and volunteer activities — have both increased.

Cooperative education placements meanwhile remain robust and dynamic, and the overall number of placements available, both domestically and internationally, is increasing. Students are strongly positive about their cooperative education placements, see them as challenging, and rate them as highly relevant for achieving their career and long-term goals and aspirations.

As the breadth of Northeastern's experiential learning opportunities has grown well beyond cooperative education, the University has made changes in organization and management to leverage these new opportunities. Over the past decade the division of cooperative education has been restructured. To further the integration of experiential learning with the academic curriculum, the cooperative education faculty have been moved both physically and administratively into the colleges and, as of 2006, report directly to the deans of the colleges. Also, the focus of cooperative education coordinators is no longer simply on employment but rather on job quality. A new position, Vice Provost for Experiential Learning, was created in 2008 to ensure coordination among the decentralized cooperative education faculty and central cooperative education services, such as

the research function and the development of international cooperative education placements. The Vice Provost will work with departments and colleges to develop shared guidelines for experiences that truly give rise to experiential learning, learning that is authentic, substantial, and integrated with classroom education.

The final critical link in retaining Northeastern's leadership in experiential learning – and providing the best opportunities to students — is continuing to advance in the assessment of experiential learning, of its integration with the academic curriculum, and of overall learning. The NU Core's strong writing component provides a mechanism for evaluating the depth of integration and for tying critical thinking to experiential learning. Thoughtful analysis of information derived from such rich methods of assessment will be necessary as the University continues to improve the experiential education programs to meet the rising expectations and ambitions of Northeastern's student body.

## Interdisciplinary and Translational Research

### *To create and translate knowledge to meet global and societal needs*

The creation of new knowledge and new technologies continues to accelerate rapidly. Whether such advances are motivated by a desire to solve societal problems, remain competitive on a global level, provide economic prosperity for citizens, or extend human understanding, universities will increasingly play a critical role in shaping this research and scholarly agenda. With expanding opportunities, however, come increasing challenges.

The aim of research at Northeastern University is to participate in addressing the significant problems that confront society today, whether in the neighboring urban environment or across the globe. These problems are often too complex to be sufficiently addressed by a single researcher or single discipline, so interdisciplinarity, coupled with collaborations and partnerships that cross academic and geographic boundaries, are keys to success. This vision is reflected in much of the research that is carried out at the University and also in the value placed on the education of students toward this end.

Fundamental and translational research share the long-term goal of improving human existence. At Northeastern, excellence in pure research undergirds the translation of fundamental research into applications that will contribute to economic development and will enhance societal well-being. Students who participate in research groups that transcend traditional boundaries learn the value of mastering a subject in depth in order to apply it effectively at the interface of disciplines.

Research and scholarship take place in and between all of Northeastern's academic units: its nine schools and colleges — Arts and Sciences, Business Administration, Computer and Information Science, Criminal Justice, Engineering, Health Sciences, Professional Studies, Law, and Technological Entrepreneurship — as well as 33 interdisciplinary centers and institutes.

Research at Northeastern builds on a rich history that includes a strong entrepreneurial culture and a culture of collaboration — an approach that encompasses partners in government and industry; artists and innovators; and scholars both inside and outside the Northeastern community. This history is enhanced by Northeastern's strong interdisciplinary research centers, by its

location in Boston, and by its highly organized, academically integrated and very effective cooperative education program.

Northeastern's well-developed collaborative research efforts currently span such interdisciplinary fields as nanotechnology, biotechnology, sensing and imaging, and urban policy. In the arena of sensing and imaging, for example, Northeastern scientists and engineers, with support from the Keck Foundation, have developed the world's first 3-D fusion microscope. This microscope has been used for a broad spectrum of projects, from the determination of mouse embryo viability to non-invasive, intracellular nanoparticle tracking for gene delivery. The microscope has also been used to further collaborative research and practice in the arts, as Northeastern has made it available to the painting and furniture restoration specialists in the Museum of Fine Arts in Boston.

The School of Social Science, Urban Affairs and Public Policy, launched in 2006, promotes cross-disciplinary social science research and aspires to be the premier policy innovation laboratory for Boston and the surrounding region. It houses several research centers and is developing partnerships with local governments, community organizations, and non-profit institutions with which it carries out customized, applied research using both student and faculty researchers. The School's partnerships to date include providing technical assistance to the Commonwealth Housing Task Force for the development of new housing legislation in Massachusetts and collaborating with Ocean State Action, a grassroots advocacy organization in Rhode Island, to survey health policy issues.

Collaborative, interdisciplinary work at Northeastern crosses many boundaries. Political scientists, engineers, and a philosopher are co-principal investigators on a project funded by the National Science Foundation that studies the public interest implications of the nanotechnology revolution, particularly the government's capacity to address the societal and policy challenges posed by emerging nanoscale innovations and products.

Northeastern is committed to including students, both undergraduate and graduate, in the University's research enterprise, including its distinctive interdisciplinary emphasis. Undergraduates have available to them a broad spectrum of dual majors and interdisciplinary majors and minors. Graduate students are generally admitted to Northeastern through a particular department, but many work in interdisciplinary centers or in cross-university collaborative groups. Some students work in industrial settings where a faculty member is collaborating with an industrial partner.

Professional master's degrees have been another area where Northeastern has emphasized education in interdisciplinary fields. The Alfred P. Sloan Foundation provided seed funding for master's degree programs in bioinformatics (launched in 2001) and biotechnology (2004). Northeastern has five professional master's degrees that are interdisciplinary between units and a few housed within a single department, such as the M.S. in Marine Biology offered by the Biology Department. Professional master's degree programs frequently draw instructors from among the many distinguished practitioners in the Boston area.

A relatively recent example of Northeastern's commitment to interdisciplinary education in translational fields is the development of the School of Technological Entrepreneurship. This is the nation's first stand-alone school to offer an interdisciplinary, experiential program aimed at the

commercialization of technological ideas. Classes are team-taught by faculty members from several colleges, and project teams of business and engineering students work in on-campus, company-like structures called I-cubators (<http://www.northeastern.edu/ste/i-cubators.html>) to develop technology, evaluate markets, create business plans, and so forth. The School offers an undergraduate minor, a graduate certificate, and a master's degree.

While Northeastern has made a strong commitment to interdisciplinary and translational research, the Provost's Office is evaluating ways to better support the research enterprise. Among the issues being considered are:

- Refining institutional policies guiding the development, funding, reporting structure, and evaluation of research centers
- The balance between large research Centers and more traditional, discipline-based research
- Diversifying the agency base of research support

Two fundamental resource issues must also be addressed in order for Northeastern to become even more visible and to achieve its research aspirations: faculty and space. Northeastern will have to increase the research support it attracts in order to increase the research it can conduct.

Because Northeastern is presently a relatively lean organization in terms of faculty numbers, it must increase the size of its research-active faculty in order to increase its base of research and scholarship. Since 2003, faculty hiring initiatives (discussed at greater length in the Standard Five chapter) have recruited outstanding new faculty members in all the tenured and tenure-track ranks. Northeastern seeks to become a destination for scholars of national and international reputation who collaborate to advance knowledge and deliver solutions that meet societal needs.

A second important resource issue is that of space. In order to continue to hire active, entrepreneurial researchers, Northeastern will need to be able to offer high-quality laboratory, office, and classroom space. Accommodating the future needs of an active and growing research enterprise is an issue that will have to be confronted soon and will be central to the discussions surrounding the development of a new ten-year institutional master plan.

Northeastern has defined interdisciplinary and translational research as one of the five major strategic themes that support its mission. Northeastern is building on its past strengths as it moves toward its aspirations. Its research programs continue to grow in ways that benefit society — discovering new drugs, controlling inflammation, detecting unseen objects, bringing nanotechnology to bear on the diagnosis and treatment of disease. Northeastern is forward-looking, not interested in copying the success of others but rather interested in developing its own pathway to success, and has been successful in attracting innovative, entrepreneurial scholars and researchers for whom this vision resonates. Northeastern expects the combination of entrepreneurial spirit, interdisciplinary research, and translational partnerships to yield innovative solutions for societal challenges.