

SELF-STUDY OVERVIEW

The Current Environment

Between 1991 and 2001, WPI continued its commitment to the revolutionary changes in undergraduate pedagogy that it adopted in 1970. WPI is now entering the fourth decade of implementing innovations in learning based on team- and project-based pedagogy. The WPI project program, especially the interactive project, provides WPI and, increasingly, other institutions with best practices for structuring an environment where students really do “learn how to learn.” WPI’s graduate and research programs have grown steadily; and continuing studies for adult professionals flourished through much of the 1990s (successes in these areas have included the establishment of two branch campuses in Waltham and Southborough, Mass.).

Of special significance during this decade have been the gradual development and implementation of planning and resource allocation systems based on assessing the outcomes of educational and support programs aligned with WPI’s mission and goals statements. When Edward Alton Parrish became president in 1995, he made resource allocation based on outcomes assessment central to the ongoing process of strategic planning. The first phase of this process culminated in 1999 with the adoption of a plan and a vision for the next decade.

Since the 1991 NEASC visit, WPI has enjoyed a strong decade financially. The endowment grew to \$330 million by June 2001, and WPI has finished each fiscal year with a surplus. WPI is well over two-thirds of the way to the \$150 million goal of its current capital campaign, scheduled for conclusion in 2003. Throughout the decade, undergraduate enrollment has been fairly stable, by design, remaining at a level optimal for campus resources. It peaked at 2,801 in fiscal year 1993, reached a low point, 2,606, in fiscal year 1995, and leveled off at 2,701 in fiscal year 2000. During the same decade, graduate enrollment (full- and part-time) remained above 1,000 every year except fiscal year 1994, when it was 933.

The undergraduate enrollment data show some marked shifts in interest through the decade. Interest in engineering majors at WPI has varied over these 10 years, ranging from a three-decade high of 76 percent of undergraduates in fiscal year 1990 to a three-decade low of 54 percent in fiscal year 2000. WPI has maintained a relatively even undergraduate population of

between 2,600 and 2,800 by replacing engineering students with students in other areas. (For these and other enrollment data, see the 2000 Student Fact Book in the visitor's workroom.) (*)¹

In response to the concerns about diversifying the University's student base expressed in the 1991 self-study, WPI in the early 1990s created a variety of new majors in disciplines at the interfaces between existing programs or departments. Resources were allocated to create new programs or bolster existing ones, for example in undergraduate areas like biochemistry, biomedical engineering, environmental economics and policy, global studies, industrial engineering, pre-med, pre-law, system dynamics, technical writing, and theatre and technology. Graduate areas included new programs in computer and communications networks and increased emphasis on the distance-learning program in fire protection engineering and management.

All of these programs enjoy significant interest from students and continue today. But the total number of students majoring in all of the interface disciplines is less than WPI's current enrollment in computer science, which grew from 183 in fiscal year 1990 to 573 in fiscal year 2000. While the incoming class in fall 2001 appears to show a leveling off in interest in computer science, the program remains the most hard pressed at WPI in terms of securing faculty and other resources required to meet the challenges of high-quality teaching and research.

As WPI concludes its 2001 self-study in summer 2001, the following are issues of concern:

- Undergraduate application numbers have remained essentially flat over the decade even though some similar institutions report significant growth. Metrics of quality of incoming students have not increased.
- Demand for financial aid is growing again after leveling off for several years, with the increase somewhat masked by increasing availability of restricted funds. WPI has invested heavily in merit scholarships, with some success, but with considerable costs in discounting tuition for some students without documented financial need. The pool of applicants qualified for and interested in WPI, with an ability and willingness to pay WPI's costs, has not increased.
- Competition for outstanding faculty is growing in terms of salary and start-up packages.
- Infrastructure costs, especially those for information technology, outpace WPI's ability to fund them.
- Other institutions increasingly are claiming WPI's most distinctive undergraduate educational process—team- and project-based learning—as their own.

¹Throughout this report, an asterisk (*) indicates that copies of the referenced material will be placed in the visitors' workroom. The "at-sign" (@) indicates that additional material is available on the WPI web site, as noted.

- Even worse, other institutions may be marketing what WPI has long believed are its undergraduate strengths more successfully than is WPI. An extensive external review of how WPI is perceived by prospective undergraduate students has pointed out a significant disconnect between what WPI thinks are its distinctive strengths and what these individuals believe is important to them. For example, WPI has believed that projects are the best tools for learning and that its Global Perspective Program is the best form of study abroad. Some prospective students indicate that projects sound “scary” and assume that every university to which they might apply has an international program, rarely understanding the distinctive nature of WPI’s program.

In a May 12, 1992, letter, NEASC noted, “the quality of Worcester Polytechnic Institute exceeds its reputation.” Perhaps the most negative observation about the decade of the 1990s is that this characterization of WPI remains true in 2001. Despite 10 years of various attempts to build its reputation for teaching and scholarship, WPI is not well-known outside portions of New England. In the annual ranking by *U.S. News & World Report*, the WPI quality that consistently rates the lowest is its reputation (while most of the other metrics would place WPI among the top 50 national universities).

In the years since it established a strategic planning process, WPI has come to understand that it must manage its reputation as effectively as it manages all its other resources and assets. At its May 2001 meeting, the Board of Trustees voted to move ahead with an ambitious plan, designed with the aid of an external consulting firm, to build WPI’s reputation. Plans are under way in summer 2001 to launch a program aimed at winning for the University a reputation commensurate with its excellence. WPI simply must do a better job building recognition for the qualities that are already well-known among certain external constituencies, such as ABET and the Association of American Colleges and Universities. (AAC&U recently recognized the importance of WPI’s approach to fusing liberal and pre-professional learning by selecting the University as one of 16 “Leadership Institutions” in its new “Greater Expectations” program.)

Community Building Since the Last NEASC Visit

During the last decade, WPI has worked hard at community building and especially at increasing in all University constituencies the numbers of underrepresented minorities. The number of Black, Hispanic and Native American undergraduates increased steadily during the decade, from 38 (1.4 percent of the undergraduate population) in fiscal year 1990 to 111 (4.1 percent of all undergraduates) in fiscal year 2000; the percentage of women undergraduates rose from 18.3 to 23.2 percent during the same period. WPI’s current strategic plan calls for these percentages to increase significantly over the next decade: underrepresented minorities to 15 percent and women to 30 percent. (The plan calls for engineering and computer science majors to constitute 70 percent of the student body after 10 years.) Similarly, the plan calls for the raising of the percentage of minority faculty from 11 percent currently to 15 percent, and women faculty from 13 percent to 25 percent. In fall 2000, WPI had 16 Asian/Pacific Island, six Hispanic and one African-American faculty members, with several other faculty members in these categories in the process of becoming American citizens or resident aliens. By comparison, in 1991 there were no Black faculty members at WPI and only one Hispanic.

WPI's community building during the 1990s culminated in spring 2001 with the opening of the Campus Center. Self-studies for almost a century had pointed to the need for WPI to establish a physical space designed specifically to promote interactions among all elements of the WPI community, with professionally developed and managed programs to nurture social and cultural interactions. The 1992 Commission on Residential and Social Life at WPI made the design and construction of a campus center the major recommendation for enhancing the sense of community at WPI. The center became a reality during the decade under review in this self-study. The 1992 study also called for a campus-wide Community Council, which was established in 1993 and re-established (after several years of inactivity) in 2000.

Major Findings of the Self-Study

Standard 1: Mission and Goals. WPI's mission and goal statements were drafted 15 years ago, but many believe they continue to provide good direction for the University's developing and changing academic programs and outcomes. The objectives of the undergraduate and graduate programs are well defined, and are supported by appropriate assessment procedures that have been useful in preparing for outcomes-based accreditation. Continuing education and distance learning programs have enjoyed significant growth since the last visit. Each of the five vice-presidential divisions is at a different stage of implementing metrics and self-assessment to measure its efficacy in carrying out its own specific mission as part of the University's overall mission. The experience of preparing for the present self-study has shown the need to focus more attention within the whole community on examining the existing goal and mission statements.

Standard 2: Planning and Evaluation. For short- and medium-term planning, the current system of monthly faculty and department head meetings is reasonably effective. At the strategic level, WPI created a new strategic plan between 1996 and 1999, and began, in 1999-2000, to present measurable results through a Web site accessible by the community and in discussion with the Board of Trustees. The objective, not yet fully attained, is to construct a feedback system involving the President's Cabinet (where policy is discussed and set), the direct managers (who oversee implementation and gather data), and the budget office (which monitors resource allocation). The desired result of this feedback system is to gather data to drive behavior and resources in the direction of implementing the strategic plan. In summer 2001, as part of the ongoing strategic planning process, President Parrish began work on an operational plan to respond to those strategic issues of greatest current importance across the University and in each division.

Standard 3: Organization and Governance. Each of WPI's five fundamentally distinct organizational units has its own form of governance—the Board of Trustees, or Corporation (by-laws last updated in 1998), the administration, the faculty (constitution updated 2001), Student Government Association (by-laws updated 1991), and the Alumni Association (by-laws updated 1997). All of these, with the exception of the administration, have formal articles of organization, such as bylaws or constitutions. The primary mission and procedures of the administration are articulated in the recently revised Faculty Handbook and the new online Administrative Handbook.

Standard 4: Programs and Instruction. Faculty governance has recently considered establishing specific university-wide learning outcomes. A task force has been working on defining measurable learning achievements embodied in the WPI mission and goals statements and in our general education requirements. Innovative educational activities aimed at improving the effectiveness of the freshman year are ongoing. WPI's graduate education program is important because it provides opportunities for advanced research for students and faculty and because it substantially strengthens the University's unique undergraduate pedagogy. WPI aims to provide a seamless integration of undergraduate and graduate students working with faculty on projects of real substance. Off-campus branch sites in Southborough and Waltham, Mass., offer graduate and continuing education opportunities; continuing education programs have grown remarkably in the last decade. Finally, research activity at WPI is growing: the Office of Research Administration oversees the submission of 200 proposals yearly resulting in approximately 100 awards. External research support, including topic-specific research centers and gifts, exceeds \$10 million a year.

Standard 5: Faculty. In fall 2000, WPI had 218 tenured and tenure-track faculty members and plans continuing growth as may be necessary based upon workload demands. WPI requires excellence in both research and teaching for tenure. Of concern is generating the resources to keep salaries and facilities competitive to attract and retain top faculty. Another major current concern is the status of non-tenure-track faculty, who teach roughly 28 percent of WPI undergraduate and graduate courses.

Standard 6: Student Services. Major achievements within the Student Affairs Division to improve student life and community include opening WPI's first campus center, increasing admissions and graduation rates for underrepresented minorities, and establishing the Office of Diversity and Women's Programs. Challenges include expanding resources (including office space) for the Admissions and Financial Aid offices to ensure that WPI can continue to diversify its community and matriculate top students while using financial aid dollars to full advantage.

Standard 7: Library and Information Resources. The Information Technology Division, the newest administrative division, formed in 1998, is made up of staffs of the Gordon Library, the Computing and Communications Center (CCC), the Instructional Media Center (IMC), and the Advanced Distance Learning Network (ADLN). Collectively, these offices are responsible for the creation and management of a dynamic suite of information services and resources as well as the supporting technological infrastructure. Members of the division work closely with faculty, staff, students, alumni and administrators to understand the rapid advances in technology and their implications for learning and teaching, within the context of the division's vision and WPI policies, operations and culture.

Standard 8: Physical Resources. The maintenance, cleaning and safety of WPI's 80-acre campus, with its 32 major buildings and numerous peripheral properties, are the responsibility of the Plant Services Department. The core campus, with historic buildings dating to 1865, has a planned maintenance program of about \$3.5 million per year guided by a five-year maintenance plan and a historic preservation plan. Since 1990 WPI has invested more than \$28 million in major campus renovations. New construction has included a \$17 million campus center and the transformation of West Street into a pedestrian mall. Safety, accessibility and energy have been heavily addressed during the last decade with the installation of handicap door openers,

elevators, new sprinkler systems, and current-code-compliant fire alarm systems in several buildings (all residence halls now have sprinklers and up-to-date fire alarm systems), and the energy retrofit of 10,000 light fixtures. The campus has also benefited from extensive rehabilitation of classrooms and laboratories and an effort to maintain deferred maintenance at around \$10 million. WPI will need to address the growth of faculty and graduate education, the need for more academic space, the need to modernize library and athletic facilities, and the need to develop solutions to an ongoing parking problem.

Standard 9: Financial Resources. Over the past decade, WPI has dramatically improved its financial resources over an already strong position. The University has been able to meet the financial challenges of the addition of many new programs that have been created to achieve WPI's strategic goals. The success of *The Campaign for WPI* has generated funding for many of those goals, including the Campus Center. Even though WPI has experienced these successes, mainly due to conservative management, tremendous endowment performance, fund raising and general economic growth, a never-ending concern of a potential decline in the economy and/or enrollment is present in the planning process.

Standard 10: Public Disclosure. WPI meets its public disclosure obligations primarily through printed publications and Web sites. Over the past decade, the WPI Web site has played an increasingly important role in WPI's communications and marketing efforts and is now the first place many internal and external audiences turn to for information about the University. Most WPI publications and Web pages are produced with in-house resources, and all efforts are made to assure the currency and accuracy of those materials. The most complete and authoritative descriptions of the University are contained in the undergraduate and graduate catalogs. Efforts are under way to bring greater consistency and integration to all WPI print and electronic material aimed at external constituencies and to create a well-designed and funded, research-driven marketing and communications program aimed at expanding the University's name recognition and building its reputation.

Standard 11: Integrity. WPI aims to develop and maintain the highest standards of integrity by means of open and interactive communications within the University, coupled with the external propagation of updated handbooks, catalogs and other printed materials specifying current policies and procedures. Many WPI offices belong to their respective professional organizations and subscribe to their codes of professional conduct.