

Educating for Leadership Through Collaboration and Innovation

Nicholas P. Jones

A commitment to interdisciplinary collaboration has been a hallmark of the success of the JHU Whiting School in terms of academic excellence and leadership in innovation. Partnerships have been formed at the cross-departmental, cross-divisional, industrial, national, and international level to better serve the expanding needs of our students. A prime example of our commitment to collaboration is the Whiting School's Engineering Programs for Professionals, which owes its success to our relationship with APL. In this article I highlight many of these successful partnerships that will enable us to fulfill future goals for leadership and innovation, giving examples that range from local to global initiatives.

Soon after I returned to Johns Hopkins as Dean of the Whiting School of Engineering, I was asked what I thought was the school's greatest strength. After little deliberation, I realized that the answer is obvious—our ability to collaborate across traditional boundaries.

In one sense this refers to disciplinary boundaries. Within the Whiting School of Engineering, departmental boundaries are effectively transparent, and members of our faculty routinely collaborate with colleagues from other departments. Our ability to work across traditional engineering disciplines has long been a key to the Whiting School's leadership in research and has also helped us to establish our reputation for excellence in academics and maintain our edge as a leading center for innovation.

One clear demonstration of our commitment to interdisciplinary collaboration and the critical role we know it will play in the future of research at the Whiting School is the new Computational Sciences and

Engineering (CSE) Building currently under construction on the Homewood campus. Scheduled to open in the fall of 2007, the CSE Building will be the first academic facility at Homewood dedicated to cross-disciplinary research. This state-of-the-art facility will include labs designed specifically for collaborative work, offices, and teaching spaces and is designed to allow faculty and students in fields including computational medicine, robotics, and computer-assisted surgery to interact with their peers from different disciplines to solve problems of common interest.

Increasingly, this disciplinary transparency has applied to divisional boundaries as well. Our Biomedical Engineering Department is arguably our best (and longest-lived) example of cross-divisional collaboration, one that has been highly successful since the program's founding 44 years ago. Today this ability to work across disciplines means that engineers, researchers, clinicians, and scientists in areas as varied as applied

mathematics, computer and electrical engineering, and immunology are harnessing their diverse skills and expertise to develop creative and effective cross-disciplinary solutions to issues ranging from tissue engineering and the diagnosis and treatment of mental illness to research (in conjunction with the Johns Hopkins Mind-Brain Institute) into the creation of a data-driven computational vision.

More recently, we have established a number of formal cross-divisional research institutes. The Institute for Computational Medicine represents a collaboration among Biomedical Engineering, Computer Science, and Applied Mathematics and Statistics at the Whiting School; the Department of International Health–Disease Prevention and Control at the Bloomberg School of Public Health; and the Institute for Genetic Medicine, the Vasculitis Center, the James Buchanan Brady Urological Institute, and the National Heart Lung Blood Institute at Johns Hopkins Medicine. This organized platform for research through interdisciplinary and interdivisional initiatives aims to unlock the causes and improve the treatment of some of today’s major diseases, including prostate cancer, autism, sudden cardiac death, and vasculitis.

The new Institute for NanoBioTechnology (INBT) is another cross-divisional institute that is developing innovative, interdisciplinary research programs. Founded on partnerships among the Whiting School, the School of Medicine, the Bloomberg School of Public Health, and the Krieger School of Arts and Sciences, as well as additional collaborators from divisions such as APL, the INBT conducts research in four interrelated areas—therapeutics, diagnostics, cellular and molecular dynamics, and health and the environment—using state-of-the-art nanotechnology.

We are now considering the development of a broad cross-divisional effort at Johns Hopkins in brain science, which will again involve the School of Medicine, the Krieger School of Arts and Sciences, the Whiting School of Engineering, and APL as its primary participants. The recent partnership led by APL and involving the School of Medicine and the Whiting School in the development of a neurally activated upper-extremity prosthetic device is also noteworthy as an example of a successful effort underway across our divisions, anticipated to produce an outcome that simply would not be possible without collaboration and the wide range of highly specialized expertise and knowledge each division brings to the table.

As the lines between traditional disciplines and divisions continue to blur, so too do the boundaries between our campus and the world at large. Increasingly we are looking across institutional and international borders to explore academic and industrial partnerships with other schools and corporations that will both promote the free exchange of ideas and expertise and offer our

students and faculty new opportunities for research and enterprise.

One example of such a partnership is the recent memorandum of understanding that was signed between the Whiting School of Engineering and Shanghai Jiao Tong University in China to promote joint research and academic opportunities in bioengineering. We are now developing additional memoranda of understanding with other universities in China and in India.

We are also developing novel relationships with industry that will dramatically change how the Whiting School faculty has traditionally worked with industrial partners. For example, we are helping multinational corporations to assess their engineering needs and are seeking ways in which Whiting School faculty, both here and abroad, can provide them with the specific educational expertise they require.

I believe that nowhere is the Whiting School’s commitment to collaboration and the University’s philosophy of “knowledge for the world” better illustrated than in the strong relationship that exists between the Whiting School’s Engineering Programs for Professionals (EPP) and APL. The history of effective leadership in EPP by APL has for years drawn its strength from the quality of EPP’s academic program and instructors, a large number of whom are also professional staff at APL. This program has evolved through time to meet the needs of industry and students and continues to move forward with new areas of study, including new certificate and master’s degree programs.

Just as technology has altered the ways we regard the limits of academic disciplines and geography, it is also altering the boundaries of the traditional classroom and campus. New modes of delivery allow us to complement our traditional classes with expanded online offerings, giving us the chance to aggressively explore new national and international markets. One must question what “resident” student means in a highly interactive cyber-environment, and we are actively seeking ways to capitalize on the opportunities afforded by this expanded understanding of our students and their goals. Through online classes we are also able to better serve a growing group of students who are often struggling to balance the demands of professional and family life with their pursuit of education. More details on this exciting development and its potential impact on EPP are provided in an article by Allan Bjerkaas, the Associate Dean for Engineering Programs for Professionals, in this issue.

My goal for the future of EPP and the Whiting School of Engineering as it relates to APL is to continue to build on our great success. I see expanded offerings in master’s-level education as a critical element in the Whiting School’s educational programs, and I believe that with time the lines between traditionally defined part-time and full-time programs will continue to shift.

I anticipate more students coming into Hopkins master's programs and more of our undergraduates matriculating with the intention of completing joint bachelor's/master's degrees in 5 years.

I foresee an increasing regional demand for emerging areas such as bioengineering and information security and more opportunities to partner with multinational corporations to help them develop expertise without losing their employees to full-time degree programs. The traditional EPP and full-time Whiting School programs will represent part of a spectrum of master's offerings that will meet the needs of industry regionally, nationally and, indeed, internationally. We will offer more enrollment and course options to students that combine the strengths of both programs, preserve our academic excellence, offer relevant technical programs to the constituencies that need them, and extend the reach, reputation, and influence of Hopkins engineering worldwide. Whiting School faculty, APL staff, and other engineering professionals will collaborate

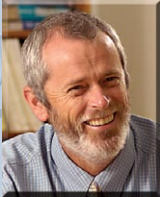
through these offerings to produce programs that truly and effectively disseminate knowledge for the global community.

In our rapidly evolving world, our ability to take advantage of new technologies, along with our commitment to innovation and competitiveness, will determine our capacity to remain at the forefront of engineering education and innovation. In this environment, I believe that greater specialization and expertise, as well as a breadth of experiences and knowledge across disciplines, will be needed simultaneously. Because of our dedication to collaborative learning and research and the tremendous strength of our students and faculty, I am confident that the Whiting School is prepared to meet these challenges.

In 1989, then Dean David Vandelinde spoke of the exciting opportunities for the Whiting School and EPP in Montgomery County—and exciting those opportunities indeed have been.

That was just the beginning.

THE AUTHOR



Nicholas P. Jones was appointed Dean of the Whiting School of Engineering in August 2004. A native of New Zealand, he received his undergraduate degree in civil engineering from the University of Auckland in 1980 and came to the United States to earn his master's and doctoral degrees from Caltech in 1981 and 1986, respectively. Dr. Jones joined Johns Hopkins as a faculty member with the Department of Civil Engineering in 1986 and was appointed chair of the department in 1999. In 2002, he joined the University of Illinois at Urbana-Champaign to head the Department of Civil and Environmental Engineering until his return to Hopkins to serve as the fourth dean of the Whiting School. Dr. Jones' research interests include various aspects of structural dynamics, flow-induced vibration, and wind engineering. He has received numerous awards for both teaching and research and serves on a number of national committees, including the Wind Effects Committee of the American Society of Civil Engineers (ASCE) Structural Engineering Institute, ASCE's Aerospace Division Executive Committee, and the Board of Directors for the American Association for Wind Engineering, to name just a few. Until recently, Dr. Jones served as editor of the *Journal of Wind Engineering and Industrial Aerodynamics*. His e-mail address is npjones@jhu.edu.

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