Impact of Hluchyj Fellowship Will Be Felt for Decades

When UMass Amherst alumni Mike and Terry Hluchyj created a fellowship in 2008 to support one graduate student per year from the College of Engineering and one from the School of Nursing, Terry Hluchyj summarized their motivation this way: "Quality healthcare ranks among the most important issues our society faces, and the collaborative research initiatives between nursing and engineering at UMass Amherst can make a real difference." Indeed, during the ensuing four years, the Hluchyj Graduate Fellowship has done just that. The research carried out by Hluchyj Fellows has already generated significant healthcare reforms, beneficial applications, important grants, prestigious journal papers, and key presentations, and it is beginning to earn fellows esteemed professional positions.

According to School of Nursing Professor Joan Roche, who has advised various Hluchyj fellows, "This fellowship will have an impact for years if not decades to come. And it's not just the money provided either. It's the opportunity to work in a relaxed environment with mentors from the two disciplines, nursing and engineering, where you have the opportunity to be creative and think about solving the big healthcare problems in new ways."

One reason for the immediate success of the Hluchyj Fellowship is because it examines thorny healthcare issues in a new collaborative fashion. It uses engineering techniques to work out issues that have hindered the healthcare field for a very long time. In four years, Hluchyj fellows have tackled such key issues as allocating the short supply of inpatient beds, studying the human side of telehealth reforms, creating a foolproof system for reporting falls in elderly patients, building smart homes for older people, and using technology to provide the vital information needs of patients nearing the end of their lives.

The knowledge in the two disciplines, engineering and nursing, flows both ways. Engineers might have technical ways of dealing with healthcare problems that would never occur to nurses, while nurses might have first-hand insights into solving those same problems that would never occur to engineers.

For example, many healthcare issues fall under the bailiwick of industrial engineers. "Industrial engineers approach problems in the medical system with the assumption that humans are fallible and make errors," explains Industrial Engineering Professor Jenna Marquard, who has been an advisor for various Hluchyj Fellows. "You can't expect humans to be perfect. So industrial engineers have to study the problem to change the process and put checks and balances in place to catch human errors before they create serious issues."

On the other hand, since few engineers have the deep knowledge of the healthcare system that nurses do, they need healthcare experts from the School of Nursing to guide and advise their technical solutions.

Thus, the Hluchyj Fellowship goes way beyond its impact on the fellows themselves. It brings together new and more effective interdisciplinary teams of faculty members.
"The work of the Hluchyj students I've advised triggered several different grant proposals that are collaborations among engineering, computer science, and nursing," says Professor Cynthia Jacelon at the School of Nursing. "This synergy came about because of the Hluchyjs, whose grants have connected various faculty from those departments."

This kind of collaboration also has the added power of giving engineering researchers a built-in network of "insiders" to help apply their findings in the medical workplace. Several faculty members at the School of Nursing, who also double as administrators and clinicians in hospitals and other facilities, are already helping shepherd Hluchyj research findings through the healthcare system toward application.

"I have been working in healthcare for five years," says Industrial Engineering Professor Hari Balasubramanian. "Working with an Hluchyj Fellow has been one of my most successful collaborations. The reason, I think, is that we have this real buy-in to the nursing group at Baystate Hospital because of the built-in collaboration between the College of Engineering and the School of Nursing. Because these nursing faculty actually work there, the people at Baystate are keen on looking at the engineering point of view and accepting engineering solutions to clinical problems. That's a rare thing."

In other words, because of the visionary philanthropy of the Hluchyjs and the visionary fellowship they established, the reverberations will echo deep into the 21st century.

The 2008-2009 Hluchyj Fellows

The first two Hluchyj Fellows, in fact, have now had several years to demonstrate their impact. They therefore serve as the prototypes for all future Hluchyj Fellows. They have used their Hluchyj grants to support their graduate research, earn their graduate degrees, publish five papers in key scientific journals, present their research at a number of conferences, and ascend to ultra-competitive professional positions, one as a post-doctoral researcher at the University Of Pennsylvania, the other at global powerhouse Philips Healthcare.

Industrial Engineering student Yi You Mei worked with her faculty sponsors, Professors Marquard and Jacelon, to design and implement a much needed electronic "falls reporting" device for the post-acute-care system at Jewish Geriatric Services in Long Meadow, Massachusetts. Since then, the device has been applied successfully for several years and is currently being updated and tweaked by a team of senior UMass mechanical engineering majors, who are working on a new dedicated server so that all healthcare professionals who need to use the reporting system have constant access.

Meanwhile, Yi and her faculty advisors, Professors Jacelon and Marquard, published a paper on her research in one of the world's top three informatics journals, the International Journal of Medical Informatics. Yi also presented her research at a conference of the American Medical Informatics Association. She is now working at Philips Healthcare.

The other one of the first two Hluchyj Fellows was School of Nursing doctoral student Kavita Radhakrishnan, whose research interest was telehealth, or the delivery of health-related services and information via telecommunications technologies.

"Kavita is now doing a post doc at the University of Pennsylvania, and the work she is doing there is following up on her Hluchyj research on telehealth," says one advisor, Professor Roche. "The reason she got this post doc was all built on the Hluchyj research she did."

Over the course of her Hluchyj year, Kavita worked on a team to evaluate the usability of two consumer health informatics platforms for several medical populations, including diabetics, post-bariatric-surgery patients, and cardiac patients.

"I think the Hluchyj Fellowship had an immediate impact for Kavita because it gave her the vehicle for using her very distinct background in both nursing and engineering," notes Professor Roche. "She came to us in nursing with a master's degree in electrical engineering. So she had the knowledge and expertise in both fields, which we don't usually find together. Had there not been an Hluchyj opportunity for her, I'm not sure she would have pursued the path that she has. Her goal is for her career to really focus on the link between engineering and nursing."

Among other outcomes, Kavita's research helped lay some groundwork for a collaborative $1,965,027 project being carried out by the UMass Medical School, the UMass Amherst College of Engineering, and Fallon Clinics in Central Massachusetts, a project supported by the Agency
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for Healthcare Research and Quality. The principal investigator for UMass Amherst’s $342,228 portion of the huge project is Professor Marquard, who served as a faculty advisor for Kavita.

There was also a collaborative research grant from Baystate Hospital based on Kavita’s research, with professor Jacelon as the UMass PI, and Professor Roche as the Baystate PI. The grant supported a survey and some focus groups to try and identify the attitudes of nurses and patients working with telehealth.

Kavita has had four papers published on her Hluchyj work, including one just accepted for publication on her dissertation and co-authored by Professors Jacelon and Roche. The title is “Perceptions on the use of telehealth for heart failure by homecare nurses and patients: A mixed method study,” accepted in Home Health Care Management & Practice.

One of Kavita’s graduate student collaborators also presented their collective research at the annual meeting of the American Medical Informatics Association. In addition, Kavita is presenting in March of 2012 at the Eastern Nursing Research Society.

2009-2010 Hluchyj Fellows

One of the 2009-2010 Hluchyj Fellows was industrial engineering grad student Ze “Jack” He, who worked on a project using eye auto-tracking devices to study the eye-scanning habits of nurses to determine why, or why not, they were identifying medical errors. Jack’s premise was that nurses may be able to learn optimal visual scanning techniques that allow them to identify and recover medical errors before they impact patients.

Jack published these findings in a paper in the Journal of Experimental Psychology, and his work informed the honors thesis of current MIE senior Majdouline Touil. It also laid some preliminary groundwork for a two-year, $175,000 National Science Foundation grant. Later, Jack earned his master’s degree as a result of all this work.

The School of Nursing Hluchyj Fellow for 2009-2010 was Shoshana Gladstone. Shoshana’s project for the Hluchyj was a state-of-the-art review of the literature covering smart environments for older adults. She used engineering, computer science, and nursing literature and looked at what was happening in terms of creating prosthetic interactive smart environments for older adults. Her faculty sponsor was Professor Jacelon, who wrote an article about this research for Geriatric Nursing that is now in review.

During her Hluchyj year, Shoshana also worked on a big gap in the literature by writing a manuscript about what older adults do with their time every day, an article currently in review at the Journal of Rehabilitation Nursing.

"I am confident that those two articles will eventually get published in those journals or some other," predicts Professor Jacelon.

Shoshana also presented her research about the everyday activities of older adults for the Eastern Nursing Research Society. Both of those projects have become part of several different collaborative grant proposals among engineering, computer science, and nursing in terms of smart environments. Her work connected several faculty from the School of Nursing with those in other departments, including Professor Marquard, Professor Aura Ganz of the Electrical and Computer Engineering Department, and Professors Al Hanson and Roderic Grupen from the Computer Science Department.

2010-2011 Hluchyj Fellows

Hluchyj Fellow Qiaohong Guo, from China, couldn't have even attended the UMass School of Nursing without her fellowship. "If Qiaohong hadn’t gotten the Hluchyj Fellowship, she couldn’t have come to UMass from China at all," says her advisor, Professor Jacelon. "It was instrumental in the International Students Office approving her visa to come and be a student. And in all likelihood she will be in the United States for a long time, and our country will benefit from her being here."

Qiaohong’s Hluchyj project was looking at the information needs of dying patients and their caregivers and how technology can help them. "The really cool thing about her project was learning how engineers think about the literature," says Professor Jacelon. "She used a lot of engineering techniques to do a very nursing oriented review of the literature. Her article is in review right now in the Journal of Advanced Nursing, which is the top-ranked international journal of nursing. Again, it will get published somewhere.
During her Hluchyj year, Xiaohong also wrote a paper on “What Is Palliative Care?” for the Journal of Advanced Nursing. In addition, she had a poster accepted at the Eastern Nursing Research Society meeting for the spring of 2012, and she will be presenting it then.

"Her work is really cutting edge," says Dr. Jacono. "She is going far. She has made this bond with Jenna Marquard that has really enriched her understanding of how to manage literature with engineering techniques. So the Hluchyj Fellowship has set up this support system that will carry her all the way through her education and beyond."

The Hluchyj Fellow from the College of Engineering for 2010-2011 was Asli Ozen, whose faculty sponsor was Professor Balasubramanian. Her project was to develop a computer-based optimization and simulation model to improve capacity allocation of inpatient beds at Baystate Hospital in Springfield, which has 27,000 inpatients annually and only 653 beds.

"Down the road, we are hoping to use her research to apply for a large grant from the Agency of Healthcare Research and Quality or the National Science Foundation to address this monumental problem throughout hospitals everywhere," says Professor Balasubramanian. "This nursing-engineering collaboration is turning out to be exactly what the Hluchyj envisioned."

Asli's Hluchyj research triggered an unexpected benefit in the School of Nursing, where her nursing advisor was Professor Roche. "I also have a nursing student working on this exact same problem, and now they are working together," says Dr. Roche. "Now my nursing student looks to engineering for answers, and this engineering student has learned how to negotiate the healthcare system. They are really the face of the future."

That last statement is true of the Hluchyj Fellowship as well. Thanks to the 20/20 foresight and insight of Mike and Terry Hluchyj, they have created the face of the future. (February 2012)