Biomedical Informatics Program Keeps Health Professionals on Technology's Cutting Edge

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Remaining at the forefront of educational innovation is something NSU's College of Osteopathic Medicine has become quite adept at over the years. In addition to housing renowned programs in osteopathic medicine and public health, the college added a third program to its academic mix in 2006—the Master of Science in Biomedical Informatics (M.S.B.I.), which is the only biomedical informatics program in existence at an osteopathic medical school.

The program, which was coordinated in collaboration with NSU's Graduate School of Computer and Information Sciences, was the brainchild of Dr. Anthony J. Silvagni, who has served as NSU-COM dean since 1998. Because he is a forward-thinking administrator, Dr. Silvagni understood that an evolving health care environment that increasingly relied on technology to maximize efficiency and deliver various services was indeed the wave of the future.

The M.S.B.I. program, which already comprises 72 students from all corners of the globe, is designed to train future leaders in the development, dissemination, and evaluation of information technology as it relates to the health care environment, which includes hospitals, health care delivery systems, health information technology system vendors, ehealth companies, insurers, pharmaceutical companies, and academic institutions. One of the program's most attractive features is its fully online format (on-campus courses also are available), which enables working professionals to earn a master's degree in this emerging field without career disruption.

"Biomedical informatics is actually a broad term that includes using technology at different levels," said Jennie Q. Lou, M.D., M.Sc., who serves as professor of biomedical

informatics, public health, and internal medicine and director of the biomedical informatics program. "Bioinformatics means we're studying and utilizing information technology at molecular and cell levels, such as using information technology in sequencing. The second echelon is the individual patient level, which is medical/clinical informatics. The upper level is public health informatics, which is using informatics at a population level. Those three prongs fall under the umbrella of biomedical informatics."

Because the country's health care system is facing uncontrolled costs, compromised patient safety, and a lack of utilization of information technology applications that have the potential to improve the situation, the need for biomedical informatics professionals has become increasingly vital. The integrative discipline of biomedical informatics arises from the synergistic application of computational, informational, cognitive, organizational, and other sciences whose primary focus is the acquisition, storage, and use of information in the health/biomedical domain.

"Biomedical informatics, which is an emerging field, serves as the bridge between health care and technology," Dr. Lou explained. "It's extremely difficult to find someone who can understand the medical side of a practice as well as the technology. Right now, there is a national movement to have electronic medical records (EMR) programs implemented at all health care facilities by the year 2014. Consequently, what facilities are doing now is looking for someone who can understand both medicine and technology. They usually have to hire two people to get the work done because very few individuals are trained to do both jobs effectively. However, students who graduate from our program are hybrids because they bridge both fields."

Presidential Decree Guarantees Growth

To address the technology lag occurring within the health care industry, President George W. Bush issued an executive order in 2004 stating that all patient health records nationwide become standardized and electronic by 2014 to help increase efficiency and lower health care costs. It's obviously an issue of vital importance given the fact that President Barack Obama is following through on the venture, which he discussed at length during a January 2009 speech he gave about the economy before he officially took over as commander and chief. "This will cut waste, eliminate red tape, and reduce the need to repeat expensive medical tests," President Obama said. "It just won't save billions of dollars and thousands of jobs; it will save lives by reducing the deadly but preventable medical errors that pervade our health care system."

To help with this initiative, billions of dollars in health information technology spending has been included in the latest version of the president's economic stimulus bill. "It's all about reducing medical errors, improving the quality of health care, and reducing the cost of health care," Dr. Lou explained. "To accomplish this, the government has added incentives to encourage the use of e-prescribing since only a small percentage of physicians are currently using it. Starting in 2009, physicians who use e-prescribing are going to receive an extra 2.5 percent reimbursement rate. In 2010, the reimbursement will be reduced to 2 percent, but physicians will be penalized .5 percent if they don't use e-prescribe. By 2014, those who don't use the system will be penalized 2.5 percent."

Because NSU believes in practicing what it teaches, the university has been transitioning to an EMR system throughout its 17 clinics.

According to a recent study, only 8 percent of the nation's 5,000 hospitals and 17 percent of the country's physician workforce, which numbers about 800,000, currently use the kind of common computerized recordkeeping systems President Obama envisions for the entire nation. There are also major concerns about patient privacy, which isn't surprising considering how often hackers are able to access various other types of electronic records such as credit card, bank, and other consumer information.

To help train professionals in this burgeoning field, the college's M.S.B.I. program, which currently includes 14 faculty members, offers a diverse range of required and elective courses that are designed to provide graduates with the knowledge and skills needed to face the challenges posed in what has become a highly technologic health care environment. Following are some of the courses offered through the M.S.B.I. curriculum:

- *Management Information Systems in Health Care*
- *Database Systems in Health Care*
- *Information Security in Health Care*
- *Telecommunications and Computer Networking*
- *System Analysis and Design for Health Care*
- *Human-Computer Interaction in Health Care Settings*
- *Survey of Medical Informatics*
- *Clinical Decision Support Systems*
- *Managing Organizational Behavior for Medical Informatics*
- *Special Topics in Health Informatics*
- *Program Evaluation for Health Information Technology*
- *Biomedical Informatics Project/Practicum*

Why Biomedical Informatics?

People who have a degree in biomedical informatics can choose from a variety of career opportunities. The type of informatics job an individual can perform is, to some extent, dependent on his or her background. People with health care backgrounds (e.g., medicine or nursing) are more likely to use their informatics expertise in roles such as a chief medical officer or nursing information officer. Those who do not possess health care backgrounds are more likely to work in a range of other widely available jobs.

People with biomedical informatics backgrounds may become chief information officers, local project managers, project designers, researchers, programmers, systems analysts, and educators.

A Field of Endless Possibilities

According to Dr. Lou, who designs the ever-evolving 43-credit M.S.B.I. curriculum, interest in the program is broad-based and widespread. "We currently have a number of physicians, pharmacists, and nurses enrolled, as well as those who hold a M.B.A., Ph.D., or Ed.D. degree," said Dr. Lou, who also credits Drs. Lawrence Jacobson and Leonard Levy with making the program the success it is today. "These individuals want to understand the technology aspect so they can make the necessary changes in their work environments. For example, I have a practicing OB-GYN in the program who wants to become an expert consultant, while other physicians want to learn more about EMR software or how to select e-prescribing software, which allows a prescriber to electronically send an accurate, error-free, and understandable prescription directly to a pharmacy from the point of care.

"We also found that many of our students are from the information technology (IT) field and the business world," she added. "In fact, we have people in the program who have many years of IT experience, but they want to know more about how technology can be used in the health care field, and they want to obtain an additional degree to broaden their career options."

Of the 72 students currently enrolled in the program, about 45 percent are from Florida while others are from far-flung destinations such as India, Egypt, and Saudi Arabia or other parts of the United States. One current student in Saudi Arabia is hoping to become the first female medical informatician in her country, while another–the first student enrolled in the program–has already become a bona-fide success story.

"When this student began the program, he was working in a nursing home job that provided little opportunity for career advancement," Dr. Lou said. "However, by his second semester in the program, he was hired by the Cleveland Clinic, which already had a very advanced electronic medical records system.

According to a 2008 compensation survey by the Vendome Group on the salaries and benefits of health care information technology, the median salary in the health information technology field ranges from $67,000 to $217,000 depending on variables such as previous degrees and field, level of position acquired, geographic location, and nature and size of the facility.

As part of his M.S.B.I. practicum, he designed add-on software to Cleveland Clinic's system that allowed the facility to improve efficiency by tracking things in real time such as how quickly the nursing station responded when a patient was discharged and how quickly housekeeping was notified."

As the M.S.B.I. program continues to evolve, Dr. Lou has some very specific goals in mind to ensure it offers students the most relevant curriculum possible. "We want to build a very solid program that will provide students the skills they need to accomplish various health information technology implementation tasks," she explained. "We are constantly revamping the program by identifying what skills are most sought by employers. For example, we added a course called Program Evaluation for Health Information Technology because it was the number one skill identified by employers. We also want our students to have more hands-on experience before they graduate."

Because biomedical informatics is a fast-paced and perpetually evolving field, those involved in it have an invaluable opportunity to be on the cutting edge of this particular aspect of the health care spectrum. "It's exciting to see how motivated people are in this field," Dr. Lou stated. "People from various disciplines such as medicine, pharmacy, nursing, veterinary medicine, dentistry, information technology, and business are involved. As a result, it's exciting to work with the most intelligent and motivated professionals in the field. When I go to national conferences, I get really energized to see people who truly want to learn how to use the technology to make a difference. I'm proud to be a part of this program because we're involved in a progressive field that is making a positive difference in health care."

M.S.B.I. Program Becomes AMIA 10 x 10 Partner

In July 2008, the college's M.S.B.I. program earned a prestigious honor when it became only the fifth academic institution in the nation to be granted a partnership with the American Medical Informatics Association (AMIA) 10 x 10 Certificate Program.

The AMIA 10 x 10 Program's goal is to train 10,000 health care professionals in applied health and medical informatics by the year 2010. NSU-COM's program joined the ranks of the following medical informatics programs in the country that currently partner with the AMIA: Stanford University Medical School, University of Alabama at Birmingham, Oregon Health and Science University, and the University of Illinois at Chicago.

"Through this partnership, participants from all over the country will be able to take the certificate program through our M.S.B.I. program distance learning system and earn a 10 x 10 certificate from the American Medical Informatics Association," Dr. Lou explained. "The AMIA will be helping us market our program, so this collaboration will allow us to make it a nationally known product."