

# Public Health Education at the University of Florida: Synergism and Educational Innovation

The College of Public Health and Health Professions at the University of Florida is composed of five public health departments and four clinical health professions departments, and the college is one of six that make up the university's Health Science Center.

These organizational resources, along with the university's explicit emphasis on collaboration across professions, colleges, institutes, and centers and the strong leadership and full support of deans and other academic leaders, provide a strong foundation for educational innovations.

Three key areas in which the college has built upon these opportunities are interprofessional education, development of One Health instructional programs, and application of cutting-edge technology to students' educational experiences. These innovations represent the types of creative approaches to preparing the 21st-century workforce that can be developed through collaboration among multiple disciplines in a major university. (*Am J Public Health*. 2015;105:S83–S87. doi:10.2105/AJPH.2014.302414)

Michael G. Perri, PhD, Mary Peoples-Sheps, DrPH, Amy Blue, PhD, John A. Lednický, PhD, and Cindy Prins, PhD, MPH

**THE UNIVERSITY OF FLORIDA** (UF) College of Public Health and Health Professions embraces a broad ecological approach to improving population health that complements treatment and rehabilitation with population-based surveillance, epidemiological research, and policies and programs aimed at primary prevention. This approach is consistent with recommendations of the Institute of Medicine,<sup>1,2</sup> which has emphasized the importance of collaboration among public health disciplines and other health professions to effectively address the complex determinants of contemporary health problems. Recently, integration of public health and clinical education has been further conceptualized and implemented through major changes in the education of health professionals worldwide.<sup>3,4</sup>

The UF College of Public Health and Health Professions is in a unique position to respond to these calls and to contribute creatively to further educational developments because of its organizational components and clear priorities within the college and the larger Health Science Center. The college comprises five traditional public health departments (behavioral science and community health, biostatistics, environmental and global health, epidemiology, and health services research, management, and policy) as well as four other health professions departments (clinical and health psychology, occupational therapy, physical therapy, and speech,

language, and hearing sciences). The college has established policies and taken concrete steps to encourage collaboration among these disciplines in teaching, research, and service, such as establishing a faculty committee to promote collaboration, providing financial support for student–faculty demonstration projects that involve at least one public health department and one other health professions department, and offering a variety of opportunities for faculty and students across professions to meet and engage in discussions about collaborative ideas.

In addition, the college is one of six that make up the UF Health Science Center. In 2010, the leadership of the Health Science Center, which includes the senior vice president for health affairs, college deans, and center and institute directors, developed a five-year strategic plan called “Forward Together.” The plan specifies a model of collaboration across colleges, centers, and institutes that requires working together to improve “individual and community health through discovery, clinical and translational science and technology, exceptional education, and patient-centered, innovative, high quality health care.”<sup>5</sup> To achieve these goals, it encourages active collaboration with our sister colleges of dentistry, nursing, medicine, pharmacy, and veterinary medicine in the Health Science Center, as well as agricultural and life sciences and interdisciplinary

centers and institutes such as the Emerging Pathogens Institute, the Clinical and Translational Science Institute, and the Institute on Aging, which are physically located in new facilities designed specifically for interdisciplinary work.

Three key areas in which the college has built upon the opportunities presented by its focus on collaboration and the organizational leadership and resources to support it are interprofessional education, development of One Health instructional programs, and application of cutting-edge technology to students' educational experiences.

## INTERPROFESSIONAL EDUCATION

UF has been engaged in a growing portfolio of interprofessional educational experiences in health professions for several years. These opportunities are designed to prepare students to engage in interprofessional collaborative practice and teamwork. The learning experiences focus on content relevant across the health professions as guided by the Health Science Center's 2010 strategic plan, the interprofessional component of which is directed by the college's associate dean for educational affairs, who also serves as the associate vice president for interprofessional education in the Office of the Senior Vice President for Health Affairs. UF applies the World Health Organization's definition of interprofessional education (when “two or

more professions learn about, from and with each other”) in developing its interprofessional learning activities.<sup>6</sup>

Interprofessional education in the Health Science Center started in 1997, even before establishment of public health instructional programs in the College of Public Health and Health Professions in 2003 and the 2010 strategic plan, with the creation of the Interdisciplinary Family Health (IFH) experience. IFH brought students from multiple health professions together for a service learning experience focused on patients and families in the context of their home and community environments. Recognition of social determinants of health was embedded within students’ learning as they examined social, cultural, and economic influences on health and available community resources for volunteer families in the community.

IFH is now a two-semester course component required for first-year students in many health professions programs and in programs in the UF Institute for Food and Agricultural Sciences.<sup>7,8</sup> Each academic year, more than 600 students participate in this course, and more than 100 faculty members from colleges in the Health Science Center and the university at large facilitate between 50 and 60 small-group sessions at six different times throughout the year.

With IFH as a foundation and the introduction of public health programs and faculty, two additional interprofessional education programs have been launched. The UF Area Health Education Centers Tobacco Training and Cessation—Initial Training (ATTAC-IT) program was implemented in 2007. This initiative engages first-semester students in public health, medicine, nursing,

pharmacy, and dentistry in a required afternoon experience organized by the Area Health Education Centers program. The workshop instructs students in techniques and strategies for addressing tobacco prevention and cessation with middle school students. After the workshop, interprofessional groups of UF students engage students in local middle schools in highly interactive and applied sessions.

To strengthen interprofessional work throughout its training programs, UF initiated a third approach to interprofessional education in 2012. Interprofessional Learning in Health (IPLH) is a two-semester required course component incorporating students from 10 degree programs, including public health, audiology, occupational therapy, physical therapy, and speech and language pathology in the College of Public Health and Health Professions as well as the other colleges involved in ATTAC-IT. Students participate in three separate half-day interactive interprofessional team-based learning sessions that target material related to ambulatory patient safety, ethics, and health disparities.<sup>9–11</sup>

Each academic year, 700 student participants are subdivided into teams of seven. These teams are led by 16 faculty members from participating colleges who use team-based learning to enhance the interprofessional experience. Prior to each session, learners complete prereading assignments and are evaluated both as individuals and as teams with respect to their mastery of this content. Through discussions with each other, team members gain knowledge in areas with which they may have been unfamiliar and thus, as a group, determine the correct answer more frequently than they would on an

individual basis. Consistent with published reports of the effectiveness of team-based learning,<sup>12</sup> our data indicate that team readiness assurance scores are significantly higher than individual scores. In addition, students complete a team competencies instrument to assess their teamwork during the three sessions.

The UF Health Science Center’s commitment to interprofessional education is reflected in the long history of required learning experiences for students. This commitment has been supported by institutional leadership, including the senior vice president for health affairs and college deans. The presence of an associate vice president for interprofessional education and associated office staff fosters collaboration across the colleges and ensures that interprofessional education work reflects health issues in clinical and community settings. Given the dual role of the associate vice president as an associate dean for educational affairs in the college, opportunities for interprofessional education are expanding in the form of additional service learning experiences, global health learning, student leadership development, electronic health record learning applications, and clinical experiences within the college and the Health Science Center.

## INSTRUCTIONAL PROGRAMS IN ONE HEALTH

One Health is an approach to conceptualizing health that arises from the recognition that the health of animals, humans, and ecosystems is interconnected.<sup>13</sup> Although the term “One Health” is relatively new, the concept is not and has well-documented historic origins. For example, Hippocrates

recognized that environmental health affected public health.<sup>14</sup> More recently, Rudolf Virchow, a prominent 19th-century German physician, became interested in the linkages between human medicine and veterinary medicine while studying *Trichinella spiralis*, the agent that causes trichinosis. From those studies, he coined the term “zoonosis” in reference to contagious diseases that are passed between humans and animals. Indeed, zoonotic diseases such as anthrax, dengue fever, Lyme disease, and malaria are now recognized by all public health authorities not only for their medical significance but also for the economic effects they exert. Furthermore, recent outbreaks of zoonotic agents such as avian influenza H5N1, Ebola, and Nipah draw attention to the illnesses they cause in humans (and animals) and the reasons for their emergence, which typically involve ecosystem degradation or disruption.<sup>15</sup>

The term zoonosis also refers to animal-to-human transfer of pathogens. Reverse zoonoses (human-to-animal transmission of pathogens) occur as well and are a major biosafety concern for large-scale pig, poultry, and other food animal production facilities.<sup>16</sup> The One Health movement is not solely focused on zoonotic diseases; equally important is the interrelatedness of animal and human health with the environment and agriculture. For example, human nutrition is highly dependent on livestock, which in turn require clean water and nutritious and safe fodder. The use of pesticides in agriculture can result in unintended consequences, including the decimation of pollinators such as honeybees. When natural pollinators are removed, fewer animals and humans can be

supported by the food products of an ecosystem's flowering plants.

One Health is thus a rapidly growing international movement that emphasizes integration of public health, veterinary health, and the health of the environment to address problems arising from zoonotic pathogens, environmental changes, population growth, deforestation, and global trade and travel.<sup>17</sup> With rapid transportation of people, animals, and food now the norm in many world economies, emerging zoonotic diseases and food safety problems are appearing on a scale never seen before. To respond to and control these problems, there is a need for new approaches.

One Health uses interdisciplinary strategies to advance health in humans, animals, and the environment through communication and collaboration, with the realization that all are connected. This approach is strongly endorsed by the Centers for Disease Control and Prevention, the National Institutes of Health, the US Department of Agriculture, and many academic and professional organizations.<sup>18</sup>

Because UF includes all of the relevant scientific disciplines (e.g., public health, agriculture, botany, conservation biology, entomology, environmental engineering, epidemiology, food safety, human and veterinary medicine, microbiology, toxicology, and zoology), faculty have been involved in the One Health initiative for several years. In addition, interdisciplinary collaboration in One Health research across several UF colleges (Public Health and Health Professions, Veterinary Medicine, Medicine, and Agriculture and Life Sciences) has been growing, catalyzed by the development of the Emerging Pathogens Institute in 2006. Building on this research

strength and in response to calls for professional training to meet many of the global health issues of the 21st century, the College of Public Health and Health Professions launched the first instructional programs in One Health worldwide in 2012: a nine-credit certificate, a Master of Health Science degree, and a doctoral concentration in public health. The One Health certificate program has been the foundation for five recent US governmental training grants for international professionals.

One Health courses and other educational experiences are carefully structured to enable students to develop competence in very specific skills. The program offers particularly in-depth instruction in transmission of infectious diseases at the human–animal interface, environmental effects of disease transmission, and how new and current disease threats can be predicted and mitigated. An emphasis is placed on agricultural industries, biosecurity, entomology, zoonotic diseases, animal health, food production, pathogen detection and identification, and environmental controls. Field experiences complement the didactic content of key courses. Faculty are drawn from the UF colleges engaged in One Health research, many of which are also members of the Emerging Pathogens Institute, the Aquatic Pathobiology Laboratory, the Center for Environmental and Human Toxicology, and the One Health Center of Excellence, established in spring 2014.

### INNOVATIONS IN INSTRUCTIONAL METHODS

The emphasis on interprofessional collaboration within the

college has also produced important advances in pedagogy and course structure. In January 2013, the college launched a task force, with representation from every department, to examine the application of blended learning models as a means of enriching the effectiveness of teaching and learning in college courses. Blended learning, at its simplest, is “the thoughtful integration of classroom face-to-face learning experiences with online learning experiences.”<sup>19</sup> The initial focus of the Blended Learning Taskforce was to support the transition of several traditional didactic courses to a blended learning format that would promote collaborative learning among students and enhance achievement of higher level learning objectives.<sup>20</sup> This approach had been implemented to some degree and in various ways in several courses in different departments, but prior to establishment of the task force there had been no mechanism for faculty to share experiences or to systematically learn the most effective methods of promoting student learning.

As a group, the task force assessed the software, hardware, and staffing resources in each department to identify resources the college needed to develop to move forward with the blended learning initiative. They also met with academic innovators from other departments on campus to learn from their experiences and explored the various technologies available for the recording and delivery of course content, as well as the online tools that could be used to enhance learning experiences. A major focus of the group was elucidating best practices for the in-class portion of the blended learning model. One critical issue that emerged was the need for

compliance with accessibility requirements and approaches to best achieve that compliance; these elements were addressed in part by scripting lectures so that closed captioning could easily be added to them. The extensive investigations of the task force led to the hiring of an experienced instructional designer for the college.

It was agreed that best practices in blended learning would include leveraging technology to enhance teaching efficiency and efficacy and building mastery assessments into the courses. Four course instructors who were members of the task force and representatives of different departments (Behavioral Science and Community Health, Biostatistics, Clinical and Health Psychology, and Epidemiology) volunteered to teach the first wave of blended courses in the college. Although course materials and plans were developed independently of the group, the task force approach was vital as a mechanism for the exchange of pedagogical ideas and innovations in teaching.

In fall 2013, three graduate courses (Principles of Epidemiology, Statistical Methods for Health Science/Introduction to Biostatistical Methods, and Applied Multivariate Methods in Psychology) and one undergraduate course (Critical Issues in Public Health) were offered in a blended format. Course instructors used a variety of approaches in their blended courses, including short online lecture modules with timely assessments, group discussions and debates, applied in-class activities, and collaborative, team-based learning. End-of-course surveys were administered to students to assess their impressions of the new blended learning format. Among those who responded,

most reported that they had not previously taken a blended course, and the majority indicated that they would opt to take a course in a blended learning format again. Most students appreciated the online learning modules that allowed them to watch lectures at their own pace, as well as the opportunity to interact with other students when applying course concepts in class.

Student feedback led to revisions of the inaugural courses in fall 2014. In addition, the task force developed and distributed a precourse survey to all students enrolled in blended courses in fall 2014 to assess their familiarity with the format, their expectations for how they might feel toward the course itself, their perceptions of possible barriers to their class performance, and whether they anticipated that the blended format would increase their collaborations with other students and their own contributions in class. An end-of-course survey with comparable outcome questions will be conducted as a follow-up.

The multidepartment faculty team approach to the implementation of blended courses was invaluable. Faculty had an opportunity to discuss issues and problems with task force members during the preparation stage, which required a greater time commitment than that associated with a traditional lecture course, and during course delivery. All agreed that the new format allowed them to meet their goal of encouraging students to work collaboratively in the classroom to achieve high-level learning objectives, therefore making the effort a fruitful one. Moving forward, the task force, which now includes the instructional designer, will serve as a resource for other faculty in the college, all of whom are encouraged to

include some level of blended learning in their courses.

An additional advantage of moving to a blended format with short online lectures is that faculty members in biostatistics and epidemiology have had the opportunity to share some of their lectures with other faculty and students in the College of Medicine. These two subject areas are of interest to a wide audience both within and outside of the College of Public Health and Health Professions. Providing access to some of these lectures allows more faculty and students to explore these topics and could potentially increase intercollege education and research collaborations.

The transition to blended learning is a result of the college's emphasis on collaboration and strong guidance and leadership from the dean and other academic leaders at the university. A shift of this magnitude continues to require a strong commitment to change, support for faculty members in their efforts to modify their courses, and education on the part of faculty to learn new approaches to course delivery, as well as resources to ensure the necessary knowledge and technology to support blended learning.

## CONCLUSIONS

The innovations in public health education described here represent the types of creative approaches to preparing the 21st-century workforce that can be developed through collaboration among multiple disciplines in a major university. The UF College of Public Health and Health Professions is in a unique position to engage in such innovations because of its internal breadth of disciplines and the extensive

scientific and professional resources of the Health Science Center and the larger university. However, although a wide range of professions provides a solid foundation for interprofessional collaboration, the most critical element is the full support of university leaders who place a high value on cutting-edge instructional programs and are willing to ensure the availability of the faculty time, human and financial support, and physical facilities needed to promote collaboration across disciplines. ■

## About the Authors

The authors are with the College of Public Health and Health Professions, University of Florida, Gainesville.

Correspondence should be sent to Mary Peoples-Sheps, DrPH, 8805 SW 42nd Pl, Gainesville, FL 32608 (e-mail: mpeoplessheps@cox.net). Reprints can be ordered at <http://www.ajph.org> by clicking on the "Reprints" link.

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## Contributors

M. G. Perri established priorities for the University of Florida College of Public Health and Health Professions, supervised implementation of the innovations described in this article, and oversaw the content of the article. M. Peoples-Sheps participated in implementation of the innovations described in this article and edited the components. A. Blue developed content-related interprofessional activities in the college. J. A. Lednický provided content on One Health programs in the college. C. Prins contributed material regarding the Blended Learning Taskforce and blended courses.

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