

6-7-2016

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University of Dayton

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Recommended Citation

University of Dayton. "Engineering Wellness" (2016). http://wayback.archive-it.org/4727/20160920155219/https://www.udayton.edu/news/articles/2016/06/kim_bigelow_engineering_wellness_through_biomechanics_lab.php

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Tuesday June 7, 2016

Engineering Wellness

Combine students interested in engineering, physical therapy and medicine, and what do you get? The Engineering Wellness through Biomechanics Lab at the University of Dayton, helping people move and live better.

"Engineering students sometimes wonder if they should stay in engineering or go into physical therapy. The great thing about biomechanics is they can do both," said associate professor Kim Bigelow, Engineering Wellness through Biomechanics Lab director. "A lot of times, it's like having a medical career without medical school."

Since Bigelow opened the lab in 2009, she has mentored nearly 80 students. They've achieved great things for medical device companies like 3M and Ethicon and have been admitted to preeminent graduate schools like Johns Hopkins University and Case Western Reserve University. Four of her students received National Science Foundation Graduate Research Fellowships to pursue their doctoral degrees.

University of Dayton doctoral candidate Renee Sample currently is working with Bethany Lutheran Village in nearby Centerville to explore how distractions throw off balance. As a master's student in the Engineering Wellness through Biomechanics Lab, Sample examined how transitions between surfaces affect balance and how to prevent injuries from falls. Classmate Senia Smoot is examining how quickly one can regain stability after they are thrown off balance. As a master's student, Smoot researched the effectiveness of therapeutic devices for children with autism. Former University of Dayton students Erin Sutton and Melissa Taylor found the best and worst ways to carry groceries to limit falls.

Students in Bigelow's first-year design course, along with students in the School of Engineering's Innovation Center, are continuing work on assistive devices started with the Kettering Health Network NeuroRehab & Balance Center with a three-year, \$75,000 National Science Foundation General & Age-Related Disabilities Engineering project grant. Devices include hinged wrist orthotics for patients with clenched fists, easier to open pill boxes for patients with limited dexterity, and modified golf clubs for stroke patients.

Bigelow, Kurt Jackson, associate professor of physical therapy, and other students are working with Goodwill Easter Seals and Reach Out Montgomery County on a two-year, \$160,000 project funded by the Delmar Foundation through the Dayton Foundation to examine fall risks in regional local adult day service centers.

"For a lot of them, research changes their career trajectory," Bigelow said of her students. "More of them consider grad school now that they know how interesting and hand-on engineering can be. To be participating in these human subject tests, they're very excited, and it makes engineering something different than what they thought it was."

To learn more about the University of Dayton Engineering Wellness through Biomechanics Lab and how you can support the students' work, visit the related link or contact Kim Bigelow at 937-229-2918. For interviews, contact Shawn Robinson, associate director of media relations, at 937-229-3391 or srobinson1@udayton.edu