

The Center for Research and Creativity presents
Symposium Week – Faculty Presentations
Monday | April 8, 2019



11:00 – 11:25 a.m. | Hendricks 122

**The Biomechanical Impact of Weight on the Lower
Extremity During Descending Stair Walking**

Amanda Ransom | Physical Education and Exercise Science

Obesity, characterized by a body mass index (BMI) of ≥ 30 kg/m², negatively impacts the musculoskeletal system and has been found to be a major contributing factor of obesity induced biomechanical alterations during activities of daily living. **PURPOSE:** To examine how additional weight as seen in obesity impacts mechanical parameters and potential for injury: can the behavior be modeled, implications for obesity induced musculoskeletal disorder, and can we find ways to positively alter/improve the mechanics to reduce potential injury? **METHODS:** 15 Normal weight (BMI: 22.3 ± 1.8 , age: 23.1 ± 3.7 yrs) and 17 Obese

(BMI: 33.2 ± 2.3 , age: 31.6 ± 8.0 yrs) adults descended the stairs at self-selected walking speeds. Normal weight participants were loaded with two different external loads sufficient to increase their BMI by 5 kg/m² (~22.6% body mass). Kinematic, kinetic and Electromyography data were collected with 3D motion analysis. Frontal and sagittal plane hip and knee angles and moments were calculated. Findings in this study, point in the direction suggesting that obese descend stairs differently than a normal weight population. Weight gain may be able to be modeled in the frontal and sagittal planes during stair descent. Furthermore, it may be possible to use an acute load to determine the biomechanical implications of weight gain and how this contributes to a chronic condition such as obesity during other activities of daily living.

11:30 – 11:55 a.m. | Hendricks 122

**Experiments on the 80MHz Magritek NMR
Spectrometer**

Vijay Antharam | Chemistry

Methodist University recently acquired a Magritek 80MHz NMR (nuclear magnetic resonance spectrometer) during the Fall 2018 semester. The instrument has three channels with probes that can detect proton (1H), carbon (13C), and fluorine (9F) resonance frequencies. Advantages of table-top instruments available at MU include: quick

and rapid detection of standard compounds, assaying for presence and absence of certain molecules by running multiple scans for signal-noise enhancement, and compatibility with magnetic field strengths seen in clinical MRI machines (~2.0 Tesla). Here we present sample 1-D, and 2-D spectra of standard compounds using both proton and carbon detection, as well as samples containing heterogeneous chemical species. The theory behind magnetic resonance and NMR signal origin will also be briefly discussed.

11:00 – 11:50 a.m. | Hendricks 222

Panel Discussion: Writing to Learn

Kathy Fick | Mathematics

Denise Bauer | Engineering

Emily Leverett | English

Kelly Walter Carney | English

For the last two years, a group of faculty has been meeting to discuss John C. Bean's book *Engaging Ideas*, which describes ways to incorporate writing in content classes in such a way as to improve students' writing skills while also helping them master course content and concepts. Four members of this group who have experimented with some of Bean's suggestions would like to share the results of their efforts with other members of the faculty. Emily Wright will moderate the panel. Abstracts for the four participants' presentations follow:

"Questioning for Critical Thinking," Kathy Fick: This presentation will share short, informal written response questioning activities used in mathematics courses to encourage critical thinking, support conceptual versus procedural understanding, and aid in communication between the students and instructor by highlighting the students' thinking processes.

"Classroom to Practice," Denise Bauer: This presentation will discuss the use of open-ended problems to apply course concepts and written

communication beyond the classroom. It is common knowledge that engineers and others in STEM fields must be able to critically assess a problem and develop a solution or recommendation, but they also need to communicate those findings to others. Dr. Bauer will discuss how both these notions are integrated in an engineering course to expose students to various written communication formats.

"Scaffolding Assignments," Emily Leverett: This presentation will discuss how to create linked assignments designed to hone skills necessary for success in the course and field. The early assignments lay the groundwork for, and build toward, the final project, which integrates the skills, and sometimes content, from previous assignments. Dr. Leverett will discuss both a particular class in which she has applied this approach and some general applications.

"The Exploratory Essay," Kelly Walter Carney: This presentation will discuss the implementation of an exploratory essay assignment in Fall 2018. The mixed results of this effort will be discussed, and potential improvements suggested.

11:00 – 11:25 a.m. | Heritage Dining Room

Lecture Capture for Resource-Limited Academic Departments

O. Z. Hamzah | Business Administration

Academics units or departments are often faced with an increasing call for quality of courses delivered online. Early editions of online courses, which mirror face-to-face settings, fail to achieve the full potential of electronic media delivery for many reasons. Cost and technical knowhow are two reasons that academic units often cite for their online delivery shortcomings.

In this white paper, the author endeavors to present a simplified approach to the structure of online courses, budget allocation and setting

up a working lecture capture system with a minimal investment in software and hardware costs. The benefit of in-house small scale lecture capture also accrues to the student by lowering the cost of supplemental material and access licenses. Professionally produced online content from large publishers such as Pearson and McGraw-Hill command a premium and a lower cost alternative is likely to be welcomed by faculty members, especially in resource-restricted institutions. In-house lecture capture can also be used to augment face-to-face and hybrid course delivery thus enriching the content itself and boosting the brand image of faculty members and their host institution.

11:30 – 11:55 a.m. | Heritage Dining Room

Understanding Charter Schools: An Exploration of Similarities and Differences

Bill Dabney | Social Work

In the U.S., 43 states allow charter schools to operate and educate students. Charter schools are advertised as institutes of innovation, providing state-of-the-art curricula and pedagogies. However, many parents are unaware that charter schools are not created equally. This

study describes and categorizes the variation of state charter school policies. A cluster analysis yields three clusters of states with charter school laws that are statistically and descriptively unique in terms of charter school autonomy, funding, and growth. Through this research, school social workers and other academic advisors are able to better educate families as to the best educational opportunities available.

11:00 – 11:50 a.m. | Trustees 254

Does Curiosity Trap or Kill The Cat? The Dark Web and Its Influence on Our Kids

Sabrina Koncaba | Digital Forensics and Cybersecurity

In this digital age, kids have a wealth of opportunities to access many different types of websites. These websites vary in the types of communities as well as content and are accessible from the Surface Web and easily tracked. But what if your child was accessing other sites that were not available on the Surface Web? The Dark Web is an enticing

place where kids can be anonymous and explore their curiosity of the forbidden. If your child did this, how would you know and what would you do?

Participants will be introduced to the following: The various “Webs”: Surface, Deep and Dark; Myths and Facts of the Dark Web; How the Dark Web is Accessed and How It Works; Categories of Goods and Services; Our Kids and the Influence of the Dark Web; Protecting Our Kids from The Dark Web.

11:00 – 11:25 a.m. | Yarborough Auditorium

No One in Charge and No End in Sight: Complex Systems in the European Early 20th Century

Carl Dyke | History

In early 20th century Europe, change turned out to be hard. Or rather, since change was constant and ubiquitous, the kind of change that happened by design, under control, according to plan, from means to

ends turned out to be hard. Then as now, there wasn't much engineered change happening, and it wasn't immediately clear how to get more of it. What was becoming clear, to a whole range of Europeans running up against the limitations of intelligent design, was that change is not just complicated but complex. How to think and what to do about

11:30 – 11:55 a.m. | Yarborough Auditorium

It Was the Best of Legislation, It Was the Worst of Legislation, It Was the Age of Wisdom, It Was the Age of Foolishness, It Was the Epoch of Belief, It Was the Epoch of Incredulity...

Donald Brady | Health Care Administration

A Non-Political Unbiased Analysis of the Affordable Care Act (Obamacare) from the Perspective of *A Tale of Two Cities* by Charles Dickens (1859). With an undergraduate degree in English Literature and a long-standing love of Dickens, Chaucer, Shakespeare, and other

English authors, I often view current events within health care from the perspective of 17th and 18th century English authors. As a health care executive for 40 years and a health care professor at Methodist University for six years, I have a comprehensive understanding of the ACA. For this presentation, we will evaluate the major elements of the ACA (presented “tongue in cheek” through quotes from *A Tale of Two Cities*), vote as a group on each, and place them under the heading “age of wisdom” or “age of foolishness.”

[Engage. Enrich. Empower.]