Title: Biomechanics Outside the Classroom

Presenter: Kimberly A. Fournier, Center for Teaching Excellence

Course Background: KIN370-Biomechanics Basis of Human Movement

- Biomechanics is a core subfield in Kinesiology and thus, KIN370 is required for all majors.
- Algebra, trigonometry, physics, and anatomy are used to analyze, evaluate, and understand human movement.
- **Course Goal:** Upon successful completion of the course, students will better understand human movement using their knowledge of anatomy and mechanical principles learned in class.
- **Learning Objective:** Upon successful completion of the course, students will be able to explain various types of movement using their knowledge of anatomy and mechanical theories learned in class.
- **Concern:** Students often lose sight of the relevancy of biomechanics and its “real-world” applications.
- Each semester, students are assigned an article to read in order to help underscore professional relevancy of a particular section of content (*Montoya et al., 2009 - Effects of Warm Up with Different Weighted Bats on Normal Baseball Bat Velocity*).

Course Changes:

- Research suggests that guided reading, more specifically, question-answer tasks can help improve learning. (*Major et al., 2016 – Teaching for Learning: 101 Intentionally Designed Educational Activities to Put Students on the Path to Success*)
- The “Experience-Text-Relationship” reading strategy (series of questions) was used to help guide students in the assigned reading.
- **Misconception:** Swinging a heavier bat (or bat with weighted ring) prior to going up to bat will result in an increased swing velocity.
- **Goal of Intervention:** To help students identify this misconception and use their understanding appropriately as professionals.
- **Experience Phase:** Students answered “On My Own” questions (prior to reading the article).
- **Text Phase:** Student answered “Right There” or “Think and Search” questions using the article.
- **Relationship Phase:** Students answered “Author and You” questions. Students were required to identify connections between theory learned in class, concepts from the article, and their own experiences (relevancy).
- Assignment worth 2.5% of final grade.
- Exam 2 had 4 questions related to the article.
  - Q4 focused specifically on the misconception.
  - Q4: Using the results of this study, what weight bat would you suggest players to warm up with?

Results & Observations:

- Despite the associated course credit, 7 students (10%) did not turn in the assignment.
- When compared to a previous semester (control group), independent samples t-test did not reveal any significant difference for the average scores on the 4 questions (2.8/4 for both groups).
- However, more students answered Q4 correctly compared to control group (64.7% vs. 51.6%).
- Take-Home: Four questions may not have sufficiently quantified the effect of the reading strategy on improved understanding of the overall article. However, students were indeed able to better recognize a targeted misconception and will hopefully be less likely to make the erroneous suggestion as professionals.