

Enhancing student-centered learning in Biomechanics (KINE3050) using new and emerging technological educational tools

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Project Abstract

This project redesigned KINE-3050 (Biomechanics) as a blended course with the aim to enhance student-centered learning by: (1) developing online interactive learning modules and laboratory assignments and (2) Increasing and improving the use of new technologies to enhance student learning and engagement (Wikis and Clickers).

Online Learning Modules

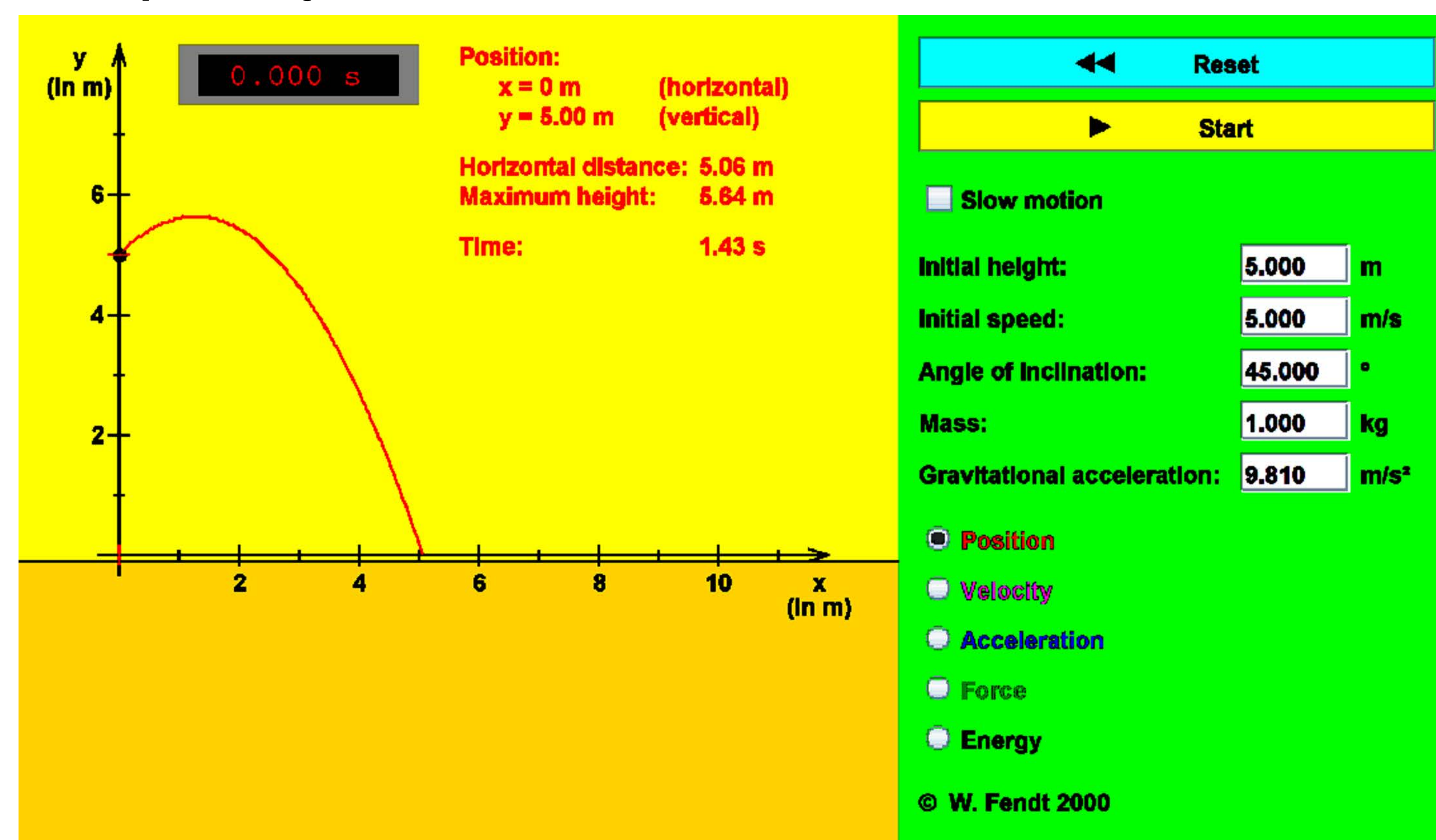
Covered topics:

- Work, Power, and Energy
- Angular Kinematics
- Forces
- Tissue Stress
- Bone and Joints

Each module includes, interactive tasks, videos, pictures, practice examples, self tests, and explanations (supplement to in-class lectures)

Online Laboratories

Example: Projectile motion



Students complete different experiments in order to learn how *takeoff*.

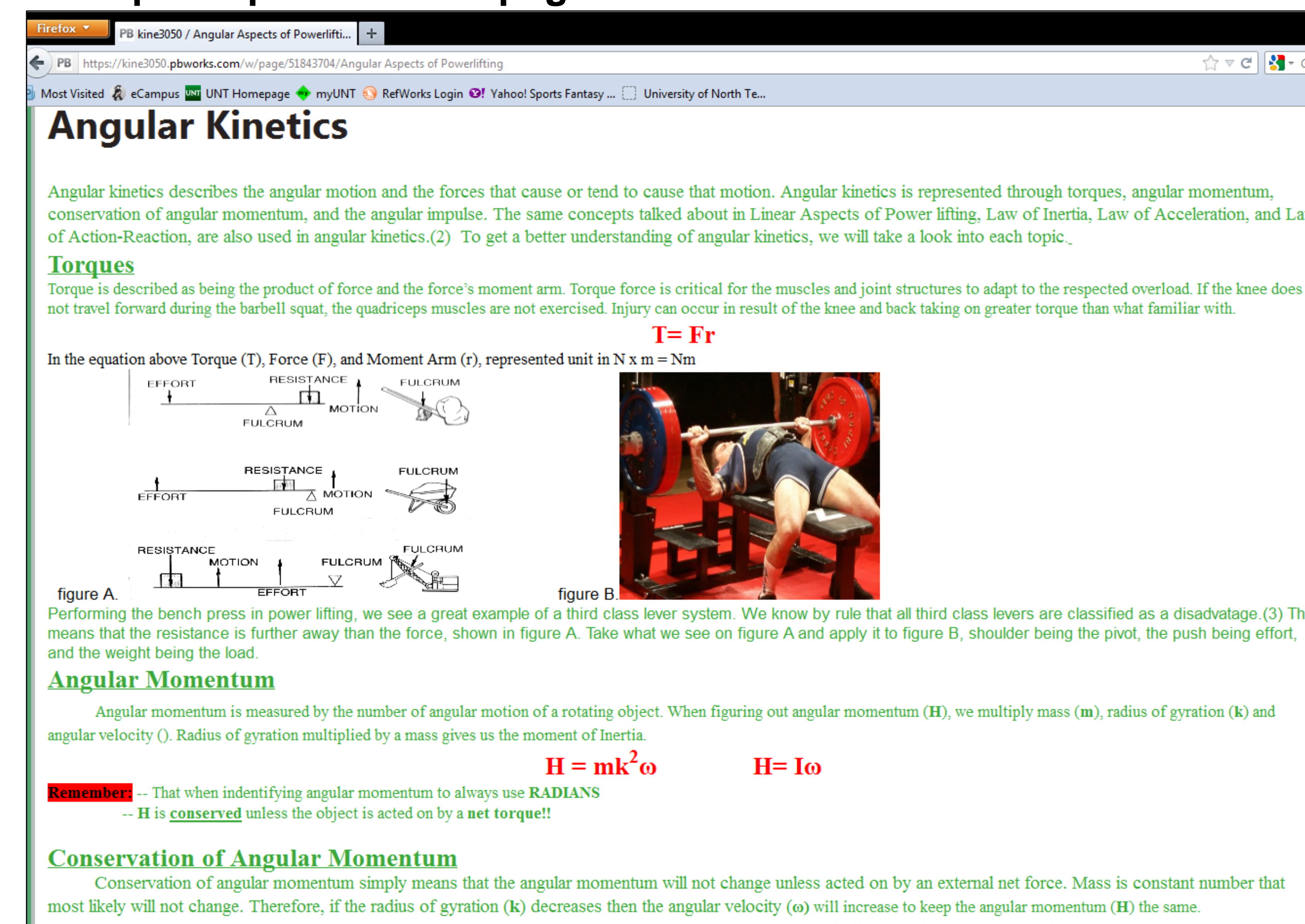
1) *Speed*, 2) *Angle*, and 3) *height relative to landing* affect the trajectory (vertical and horizontal displacement) of a projectile



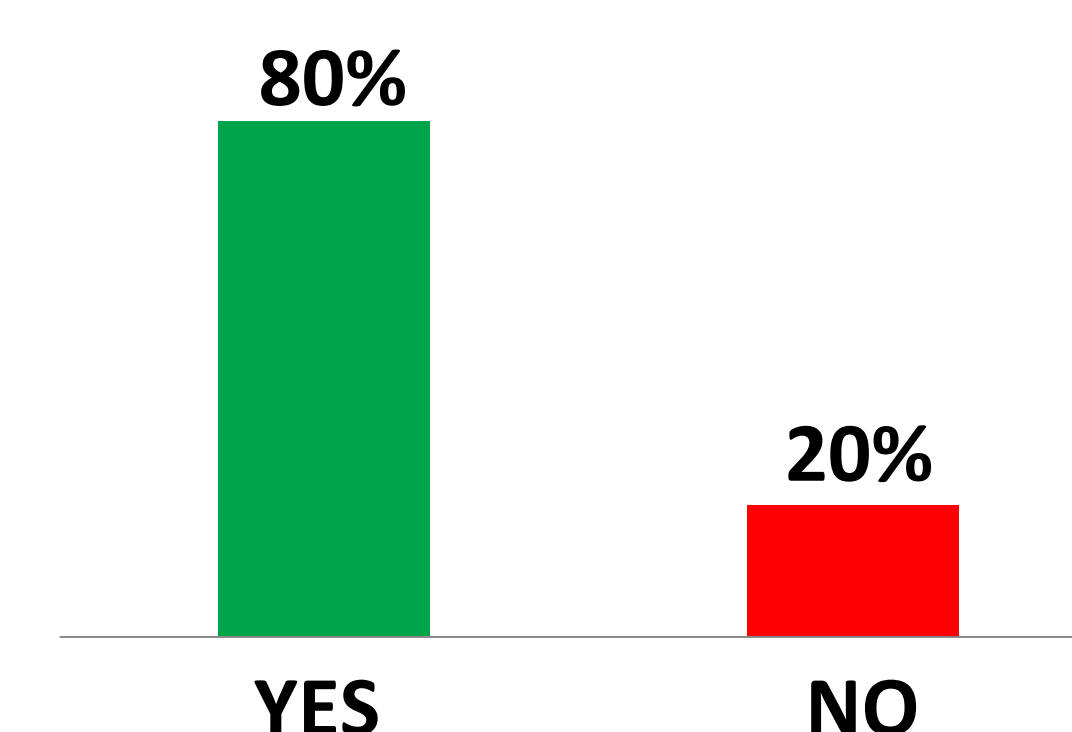
Wikis

- Informational website (similar to Wikipedia) incorporating videos, pictures, text etc.
- Made by students in groups (n=6 per group)
- Practical aspects of Biomechanics in a sport or profession (e.g., physical therapy)
- 5 different topic pages:
 - 1) Introduction, 2) Linear Aspects, 3) Angular Aspects, 4) Work, Power, and Energy, and 5) Internal Biomechanics
 - Each topic due before the exam for that topic (new this Spring)

Example of part of a wiki page



Student response to: *Should Wiki be part of this class in the future?*



Wiki challenges and corrections made:

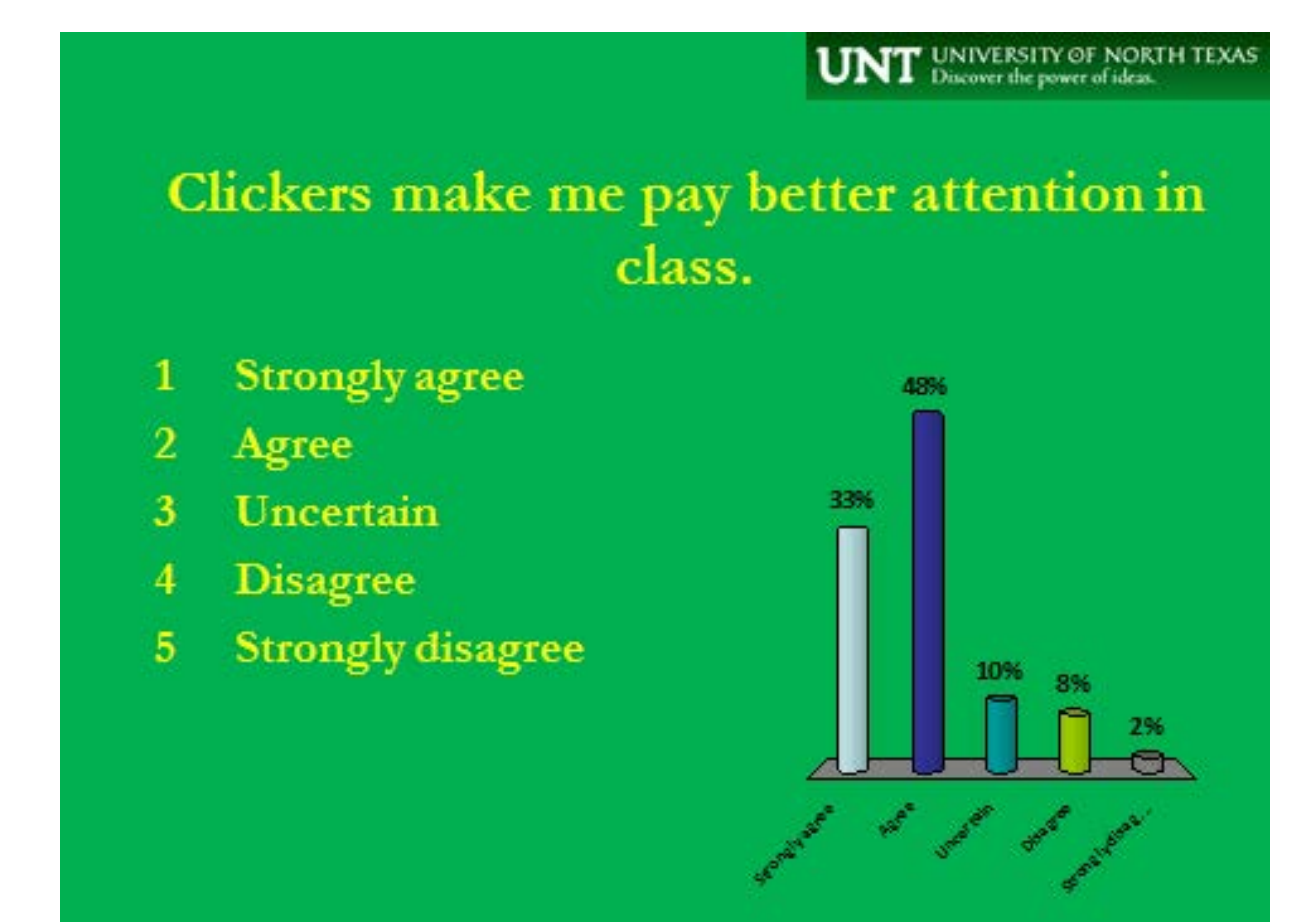
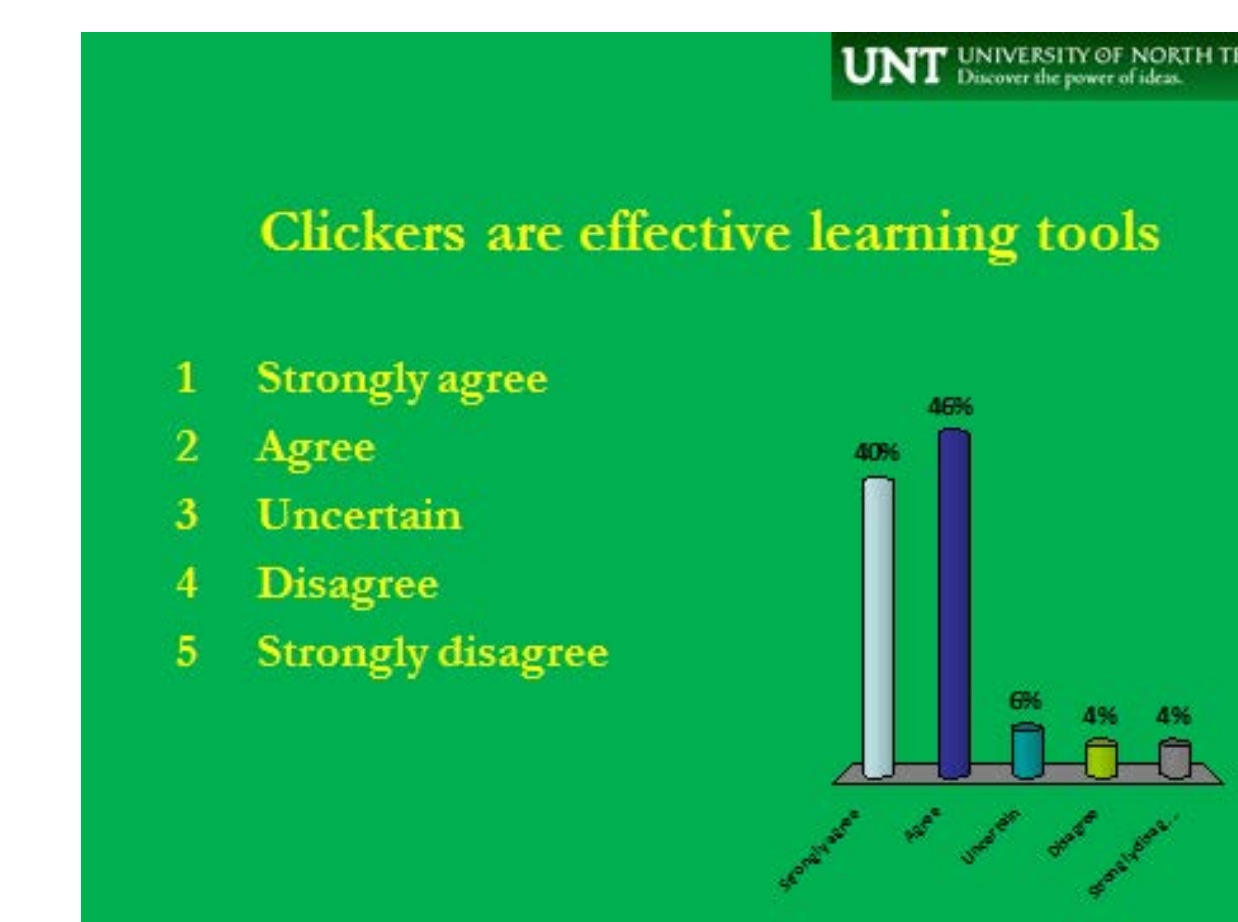
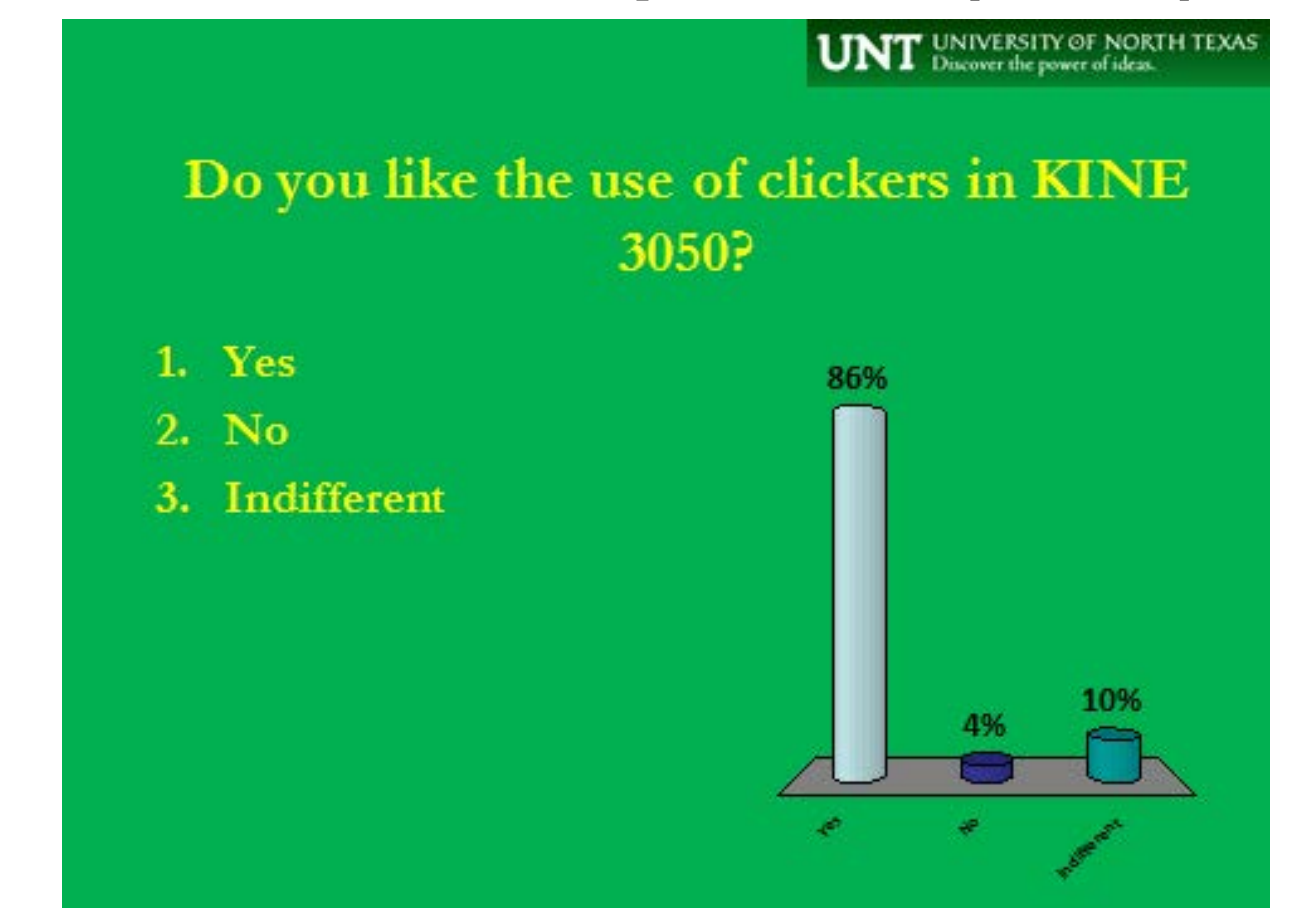
- 1) Having students working together in groups and some students not getting their work done in a timely manner or at all (by far the biggest issue)
Changes made: 1) Groups can fire members of their group. 2) Encouraging group to have their own group deadlines prior to class (syllabus) deadlines
- 2) Students having difficulties understanding how to use the PBworks website and how to complete the assignment and registering on the Pbworks website
Changes made: 1) Thorough written instructions and substantial in-class instructions early in semester. 2) In class quiz over wiki instructions. 3) Minus 5 points if not registering by 2nd week f the semester
- 3) Plagiarism
Changes made: 1) Students upload their text to Turnitin. 2) Added instruction on what constitutes plagiarism

Clickers

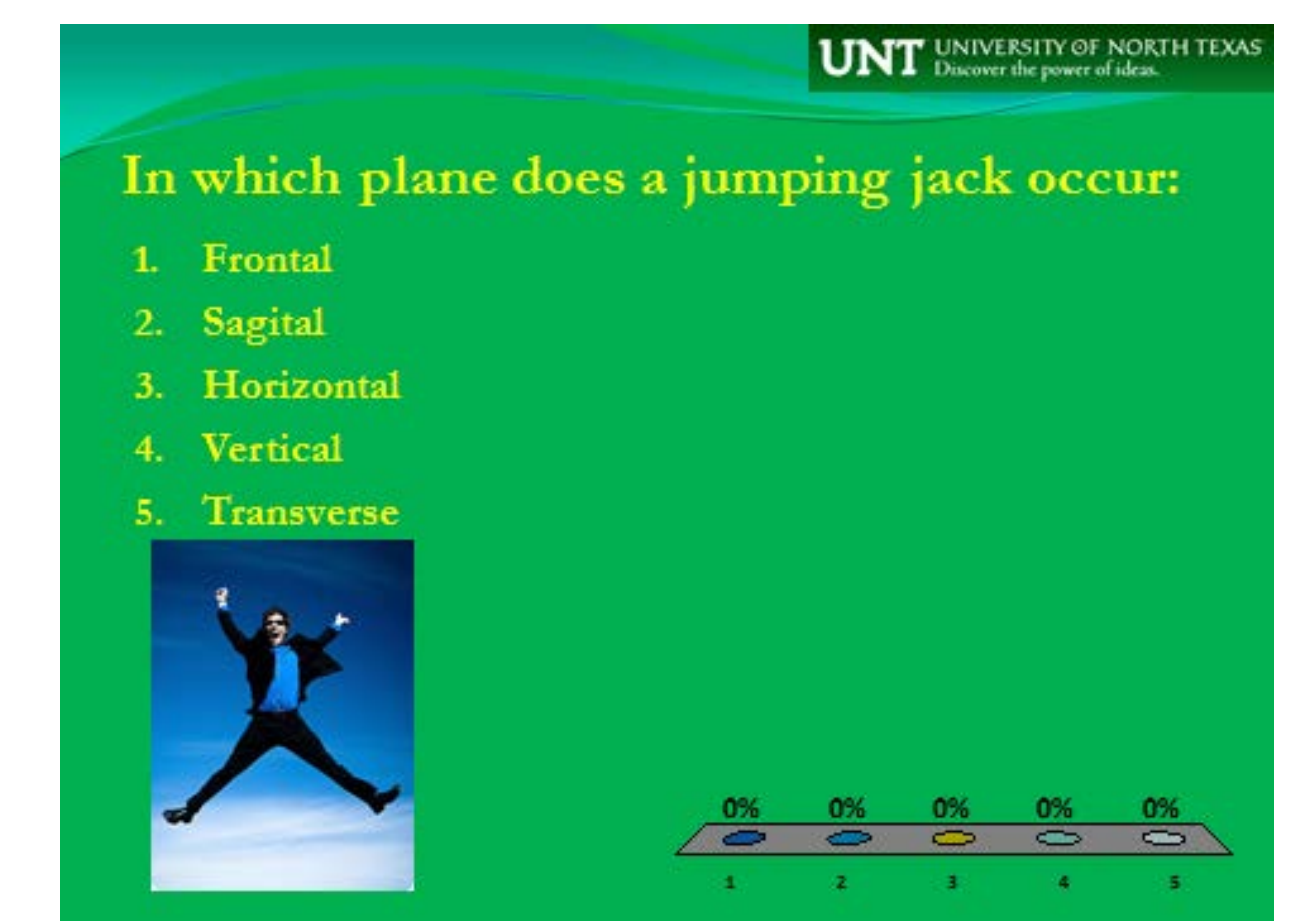
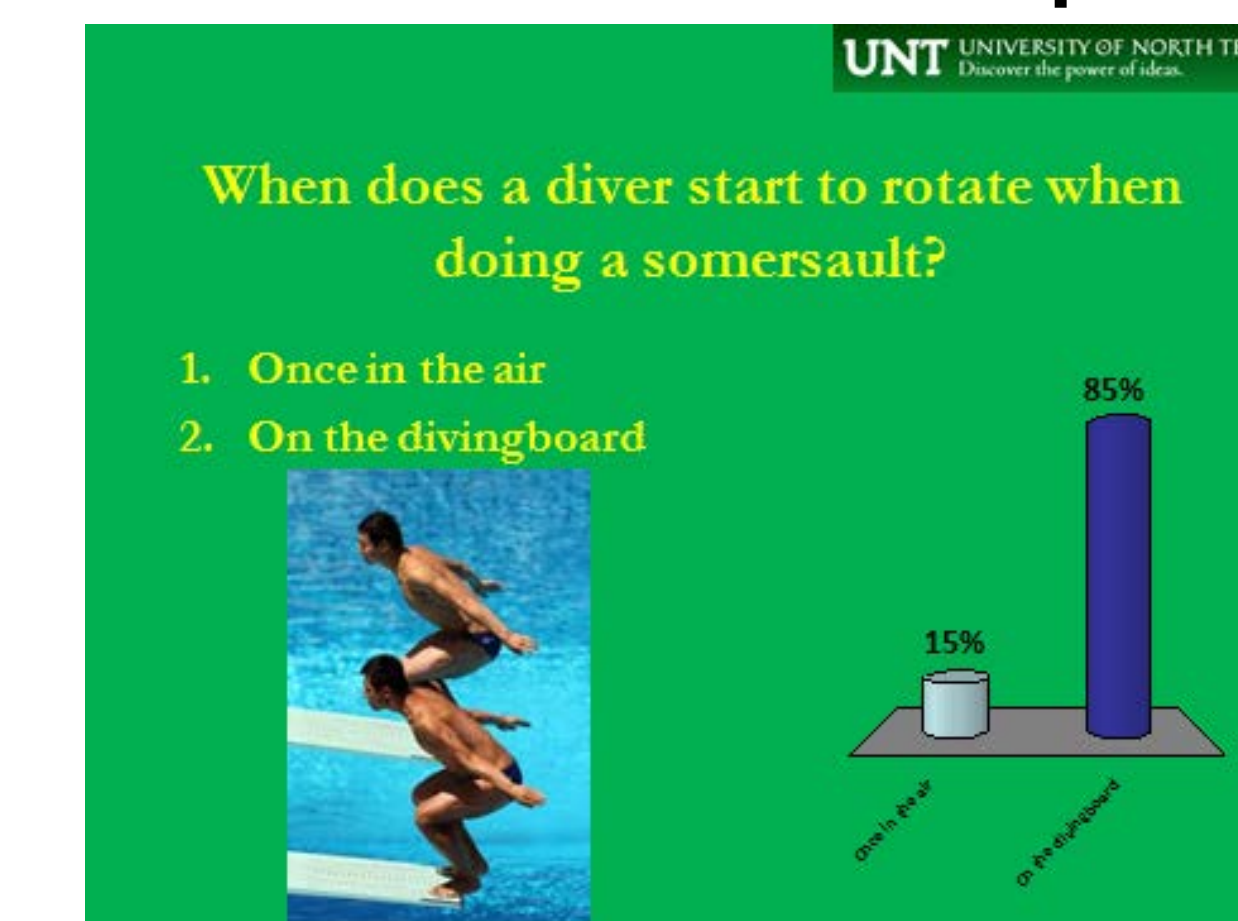
Wireless Clicker (~\$30)



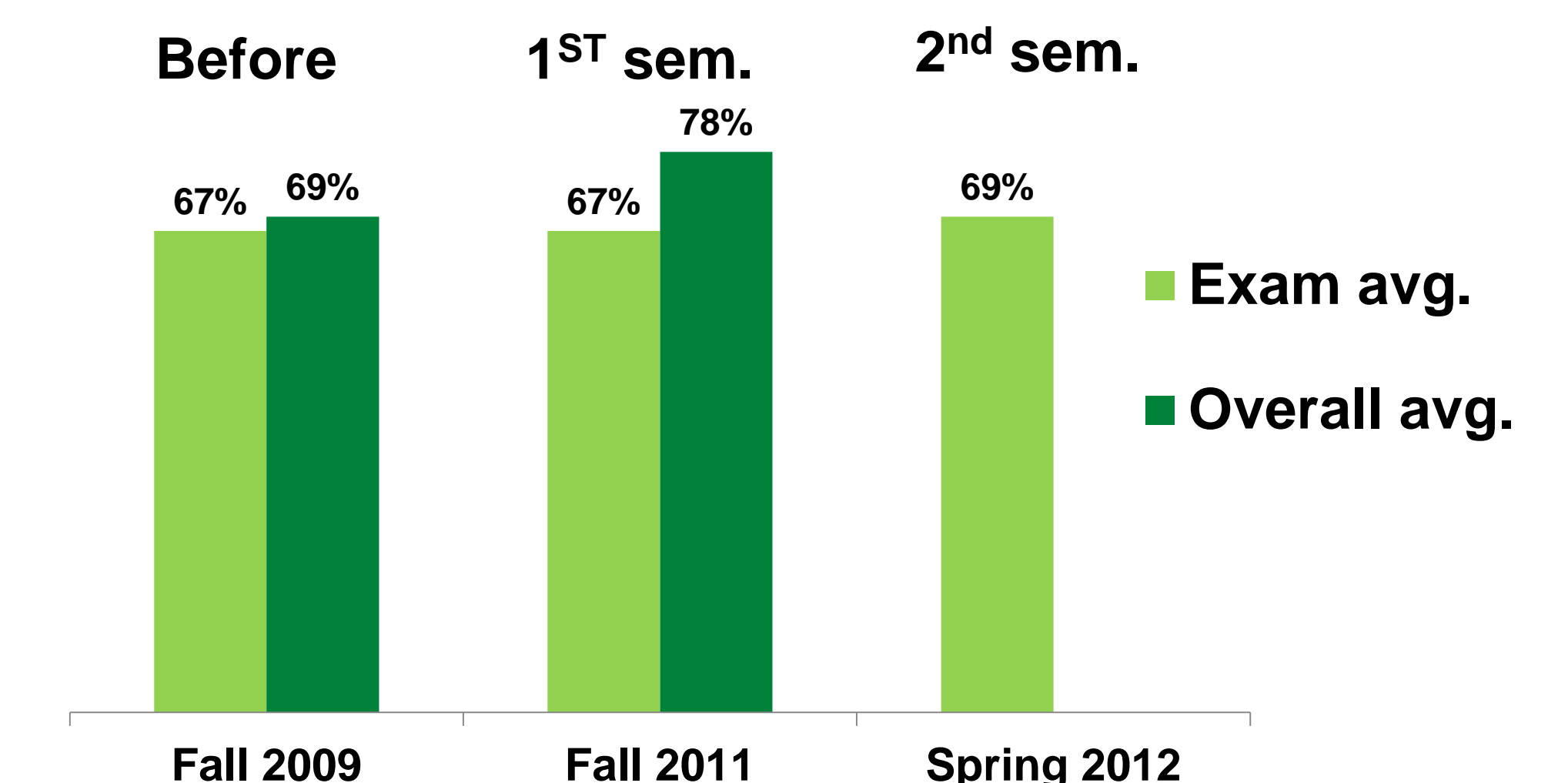
Student responses (n=50)



Example of slides used in class



Exam Scores and Grades



Conclusion

- The implementation of technology in KINE3050:
 - Did not improve exam scores
 - Improved overall score (grade) for course
 - Largely due to high scores on wiki assignments