

GF01: How Do We Motivate Students to Study the Text?

Brad R. Trees

Ohio Wesleyan University

July 30, 2014

The logo for Ohio Wesleyan University, featuring the text "Ohio Wesleyan University" in white serif font on a red square background with a vertical white line to the right.

Ohio
Wesleyan
University

Digital Text: *Physics for Scientists and Engineers*

- Project: Digital text (E-text) for calculus-based physics.
 - Interactive
 - Annotable
 - Searchable
 - Accessed online
- In collaboration with John Wiley & Sons.

WILEY

- Physics editors: Stuart Johnson, Jessica Fiorillo.

Our Tried and True Friend: The Print Physics Text

- Organizer of content and storehouse of problems.
- Students often do not study text as instructor intends.
- Student passively receives information.

References

- “The Perceived Value of College Physics Textbooks: Students and Instructors May not See Eye to Eye”, Noah Podolefsky and Noah Finkelstein, *The Physics Teacher* **44**, 338 (2006).
- “Technology and Learning: Reimagining the Textbook”, James Onderdonk, Douglas Allen, Dwight Allen, *J. of Cont. Higher Ed.* **57**, 120 (2009).

Technology and Physics Pedagogy

- Multimedia Learning Modules for pre-lecture content. (Smart Physics)
- Guided discovery with simulations. (Physlets and PhETs)
- Adaptive learning software.

References

- “Using Multimedia Modules to Better Prepare Students for Introductory Physics Lecture,” Zhongzhou Chen, Timothy Seltzer, Gary Gladding, *Phys. Rev. ST Phys. Educ. Res.* **6**, 010108 (2010).
- “PhET: Simulations That Enhance Learning”, Carl Wieman, Wendy Adams, Katherine Perkins, *Science* **322**, 682 (2008).
- “Adaptive Online Learning: The Present and Future of Education”, Bruce McLaren (Wiley, 2013).

Digital Textbook Project: Enhanced Engagement

- Two Key Aspects: **Visualization** and **Meaningful Interaction**.
- **Visualization**: *Mathematica* modules that demonstrate/model physical principles; videos of real-world phenomena; multimedia presentations of content.
- **Meaningful Interaction**: Frequent questions requiring input from students; immediate outcome feedback. (Formative Assessment)
- *Redistribution* of study time.