

WileyPLUS

## Case Study

Optimizing learning for physics students

### **Improving students' out-of-classroom experience with WileyPLUS**

Case Study: **Halliday and Resnick's *Fundamentals of Physics*,  
12th Edition in WileyPLUS**

Challenge: **Decrease failure rates**

Solution: **Pre-lectures videos in a flipped classroom with  
adaptive assignments**

## Background

Professor Melanie Good teaches calculus-based physics at the University of Pittsburgh. In fall 2021, she transitioned her course to a “flipped” mode of instruction; outside of class, students watched a full-length lecture video and completed homework in a system separate from the textbook. However, she quickly realized some students were struggling to keep up.

So, in fall 2022, Professor Good started using the WileyPLUS course with inclusive access for Halliday and Resnick's *Fundamentals of Physics*, 12th Edition in her class of 206 students. Using WileyPLUS integrated into the Canvas LMS system, her students' performance and engagement significantly improved.

## Challenge: Decrease failure rates

The flipped mode of instruction was designed to make the most of in-class time for students. Yet, some of Professor Good's students weren't investing time in watching the assigned YouTube videos, which functioned as full-length lectures, before class because they didn't see the benefits of doing so. Some students also didn't recognize a connection between homework assignments and in-class activity.

Moreover, they felt they didn't have enough personalized resources for studying for exams. Conscientious students performed well, but many students were getting lost. Failure rates were high, and grades were at a historic low.

**“ It appeared that a lack of continuity and user-friendliness may be to blame. ”**

## The Strategy

Professor Good hoped to achieve a comprehensive “system” her students could use to optimize their engagement and learning outside of the classroom. With one system for their textbook, homework, review, and pre-lecture preparation, she considered that students could more effectively take what was done in class and solidify their understanding outside of class, helping fewer students “slip through the cracks.”

**“ After discussion with Wiley representatives, I identified that the WileyPLUS system had the potential to address all these areas at once. ”**

In WileyPLUS, Professor Good assigned pre-lecture videos and homework directly connected to the textbook to improve the continuity of students' experiences. Adaptive assignments could also offer personalized review opportunities. Moreover, the concise format of the pre-lecture videos was more digestible and could engage students more effectively.

She insisted, “The goal was to keep what was working in class but bridge the gap for students in their out-of-classroom learning, so they would not be left floundering on their own.”

Each week, Professor Good sent a checklist out reminding students to access the pre-lecture videos and to complete their homework in WileyPLUS before class. Students also had to answer a brief set of Canvas quiz questions about the videos during class, for accountability. Adaptive assignments were a required part of their grade and functioned as a review before each exam to personalize their practice. In class, she continued with learning demonstrations, group problem-solving exercises, and concept review.

## The Result

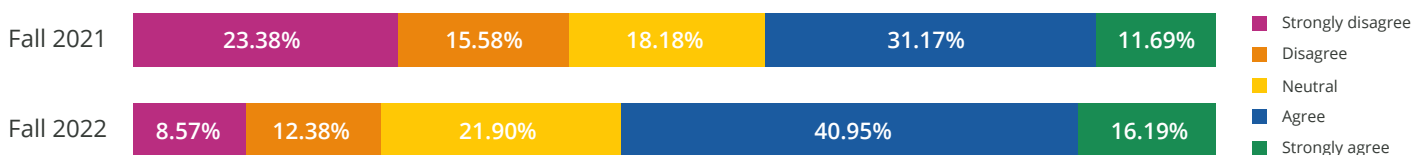
Overall, Professor Good found that, after switching to WileyPLUS, the failure rate in her class decreased by 14 percentage points. Among the small number of students who didn't pass the class, the majority (67.5%) didn't watch the pre-lecture videos on time (50%) or at all (17.5%).

### Change in failure rate



In general, Professor Good's students also liked the flipped class format more when using WileyPLUS to improve their out-of-class learning.

### Students' agreement with the following statement: I liked the flipped format of the class.



Students were more engaged with the pre-lecture videos than with the YouTube videos. More than half (51.89%) of students agreed or strongly agreed that they watched the pre-lecture videos by the suggested time. Fewer students (46.75%) agreed or strongly agreed they did the same for the YouTube videos.

**76% of students agreed or strongly agreed they liked that the pre-lecture videos were short and concise.**

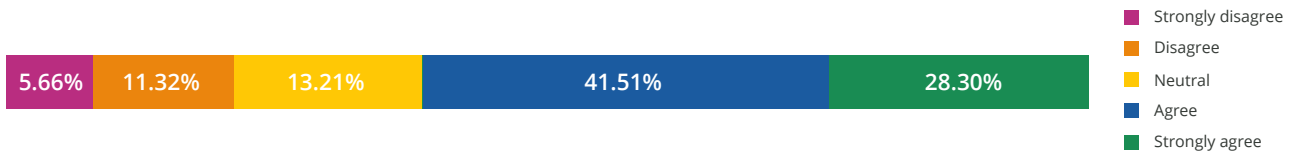
With WileyPLUS, students could clearly tell how out-of-class and in-class learning related to each other. Almost three-fourths of students (73.33%) agreed or strongly agreed that the pre-lecture videos were highly aligned to what they learned in class.

### Students' agreement with the following statement: I found the pre-lecture videos useful for introducing a topic.



Students saw value in the homework and adaptive assignments, finding them helpful to their learning. Nearly 70% of students (67.92%) agreed or strongly agreed that the WileyPLUS homework resources and solutions helped their learning. Of the small numbers of students who failed the final exam, it was more likely that they didn't do the adaptive assignments to review and therefore couldn't benefit from them.

**Students' agreement with the following statement: The adaptive assignments were personalized and helpful learning experiences to prepare me for the exams.**



## About WileyPLUS: *Fundamentals of Physics, 12th Edition*

*Fundamentals of Physics, 12th Edition* guides students through learning how to effectively read scientific material, identify fundamental concepts, reason through scientific questions, and solve quantitative problems. The course focuses on several contemporary research areas to help challenge students to recognize how scientific and engineering applications are fundamental to the world's clockwork.

The course contains many tools to support students' active learning. It provides a learning center with practice opportunities, interactive challenges, activities, simulations, and videos. Practice and assessment questions are available with immediate feedback and detailed solutions, ensuring students understand their mistakes and key problem-solving processes. To learn more about how this course could enhance your students' learning, **schedule a demo today**.

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