

The Impact of a Renewable Energy Theme on Physics Education and the Perception of Meaning

Background

Jay Pritzker Academy (Siem Reap, Cambodia) does not have a climate change curriculum. The inclusion of a renewable energy theme can tackle a pressing issue while also rendering high school physics class more meaningful?

Focus Questions:

1. To what extent does the inclusion of a renewable energy theme enhance or detract from the learning of fundamental physics?
2. To what extent can a renewable energy theme render physics class more meaningful?
3. How has the inclusion of a renewable energy theme in physics class impacted me as a teacher?

Treatment

Weave a renewable energy theme throughout the existing course curriculum.

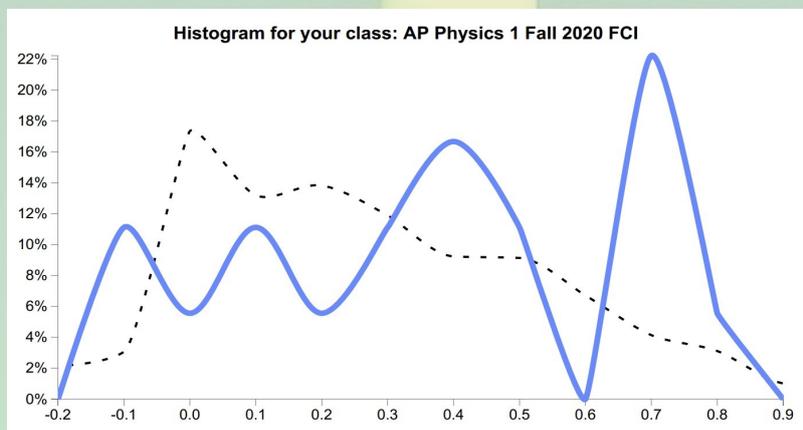
- Develop theme through frequent use of short practice problems class discussions, videos and articles tied to renewable topics,
- Provide larger assignments and lab work that develop deeper connections between theme and content
- Assess progress through class exams, Force Concept Inventory, surveys and interviews

Results

- Surveys and interviews showed overall positive perception of theme.
- Graph shows greater normalized gains on Force Concept Inventory compared to than national average.
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Solid line:
Jay Pritzker academy

Dotted line:
US average (Phsyport)



Conclusions

- The theme neither interferes with, nor enhances the acquisition of fundamental physics concepts.
- Learning physics improves students' understanding of renewable energy topics.
- The theme rendered physics education more meaningful and enjoyable for most students

Value

- Careful planning is critical to develop deep connections between course content and theme.
- The extent to which the theme diverges from fundamental physics can simultaneously provide meaning as well as additional frustration.
- Struggling students, or those who are particularly grade focused may resent the additional challenge.
- For many the theme provides depth and purpose to the content covered.