

Keynote Talk: Simulation-Based Approach to STEM Challenges

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Abstract

A new pedagogical approach to STEM challenges is currently implemented in the mechanical engineering program at the University of Hartford. This approach combines problem- and inquiry-based learning, simulations and apps with the COMSOL Multiphysics® software, and emphasizes the importance of outside-of-class learning supported by effective reference materials and faculty mentoring.

A two-course sequence was modified to contain scaffolded and contextualized simulations with application building that develop technical competency in modeling, a deeper understanding of thermofluids concepts by solving realistic technological problems, and writing skills by generating technical reports for each simulation. Apps involve creating a simplified interface that contains the full efficacy of the underlying model but not exposing the end user to its complexity.