The Engineering Education Research Group at Hamburg University of Technology (TUHH) engages in discipline-based educational research, curriculum development (including the assessment of its effectiveness), and undergraduate-level instruction in various science and engineering subjects. In this presentation, I will use examples from our research on student conceptual understanding in mechanics to illustrate how those results are used as the basis for curriculum development. I will then discuss how the materials can be integrated into a didactically coherent scenario within the boundaries of a traditional course structure. In addition, I will show data that indicate the increased effectiveness of some of the instructional materials as compared to a more traditionally taught course. Finally, this will lead me to propose new research questions for our group.