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Blending of mathematics and physics

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1. In undergraduate physics, even if students know the mathematical and the physical concepts, they may not be able to bring them together productively. (Chapter 2)
2. Graphs can form a bridge between mathematical and physical understanding, and therefore support the blending of mathematics and physics. (Chapter 4)
3. A tutorial format, using worksheet-based group learning activities, stimulates active engagement in students at university level while respecting existing instructional constraints like high student/teacher ratios. (Chapter 5)
4. Offering students opportunities to make blending explicit does not only result in a well-integrated understanding of mathematics and physics, but can also result in an extended understanding of mathematical and physical concepts separately. (This thesis)
5. It is worthwhile to invest time and effort in activating students, also at the upper undergraduate level. Strategies like small group discussions and conceptual questions offer opportunities for students to gain better understanding and take ownership of their own learning. (This thesis)
6. In advanced physics problem solving, a student goes back and forth between mathematical and physical ideas in a way that is not predefined. The conceptual blending framework, and especially the dynamic blending diagrams, make it possible to capture that process. (This thesis)
7. Providing extra mathematics courses is not the solution to support physics students at the more advanced level. Students would rather benefit from a blended approach. (This thesis)
8. Physics Education Research should become more established as a research field, it should be better embedded within the department or faculty and its findings and developments should be directly implemented in the degree programmes.