

Supporting secondary school students' understanding of time dilation through simulation-based inquiry learning

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Time dilation lies at the heart of Einstein's special relativity theory. Learning about time dilation requires students to imagine light propagation in different inertial frames of reference. For numerous reasons, students find this very difficult, especially in secondary education.

We hypothesize that this obstacle may be overcome through simulation-based inquiry learning. In this learning activity, students formulate a prediction to a thought experiment and subsequently create a simulation of the thought experiment in an online simulation tool, called Relativity lab. By comparing their prediction to the simulation's outcome, students can be stimulated to reflect on their existing conceptions about relative motion.

In order to evaluate this teaching approach, we have carried out a lesson study in which a 90-minute introductory lesson was designed, performed and evaluated by an interdisciplinary team of physics teachers and researchers. Data was collected by means of audio- and video recordings, observations, written assignments and student- and teacher interviews.

In this sparkle talk, I will present preliminary findings of our lesson study and will motivate our choice for lesson study as a research tool in design-based research. I hope to spark the joy of lesson study in modern physics education research!

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