Tutorial at a Japanese university as an interactive physics class

H. Uematsu

Tokyo Gakugei University, Tokyo 184-8501, Japan

uematsu@u-gakugei.ac.jp

Traditional lectures have been proved to have little effect in establishing physics concepts [1] and introducing interactive engagement into a physics class has been suggested by Physics Education Research (PER) groups in the Unites States in these decades [2]. Among them, Tutorial which replaces a traditional recitation is known to be especially effective although it requires substantial investment of time.

We implemented Tutorial in a physics class at Tokyo Gakugei University in 2011 with the help of the PER group of University of Maryland. We utilize worksheets and homework from Open Source Tutorials developed by the group [3]. The class is for sophomores, mostly pre-service teachers, and was a traditional recitation of fundamental physics so far.

In Tutorial, students work on worksheets in groups of 3-5. The worksheets include questions based on PER, which are well designed to get students establish fundamental concepts of physics. There are facilitators walking around the classroom to check students’ progress and to ask them questions eliciting what they really think or helping them in the case they have trouble in reasoning.

Because our curriculum is different from ones at universities in the Unites States and the class size is different, we arranged slightly the class schedule and the content of worksheets paying the closest attention not to spoil the original intention. We cannot find enough facilitators for as many as 140 students but we succeed in keeping facilitators’ morale high. As a result, students in Tutorial showed higher gain in concept building [1] than in a traditional recitation class given in previous years.

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