

Is there evidence for the flipped classroom in STEM teaching?

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The flipped classroom (or flipping) is a new educational technique which seeks to invert the traditional model of in-classroom lectures and out-of-class homework. Instead, it advocates in-class interactive group learning, and out-of-class instruction via videos or podcasts. Intuitively, this moves classroom time away from mere dissemination of information, and allows teachers to focus on solving student problems and enabling learning. This connects with the increasing evidence that problem-based learning is an effective teaching technique.

The intuition for flipping seems compelling, reflected in attention in the non-academic media. However, flipping is not trivial to apply. Applying it means restructuring the entire course to focus on group learning, while also recording supporting instructional material. Given the up-front costs, it is important to know whether flipping is truly effective before applying it in practice.

In this informal study, I discuss the rigorous evidence that flipping is effective in improving student learning outcomes in STEM subjects, and I also examine some of the pitfalls and opportunities flipping presents. My aim was to understand better how these new learning technologies could be applied to teaching in my home department, Computer Science.