DEC Learning through Scientific Argumentation! in Material Engineering

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Abstract:

Recently, "Learning through Argumentation!" is one of the 10 Innovative Learning Strategies for Modern Pedagogy (2017)*. For example, students can advance their understanding of science and mathematics by arguing in ways similar to professional scientists and mathematicians. Scientific Argumentation helps students attend to contrasting ideas, which can deepen their learning. It makes technical reasoning public, for all to learn. It also allows students to refine ideas with others, so they learn how scientists work together to establish or refute claims. Lecturers can spark meaningful discussion in classrooms by encouraging students to ask open-ended questions, re-state remarks in more scientific language, and develop and use models to construct explanations. When students argue in scientific ways, they learn how to take turns, listen actively, and respond constructively to others. The outcomes of this proposal can help lecturers to learn these strategies and overcome challenges, such as how to share their intellectual expertise with students appropriately.