Student centered learning from the lecture hall to curriculum design

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Abstract

The possibilities to let student centered learning, an important aspect of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), drive educational change will be discussed. The discussion will start from experiences from the Royal Institute of Technology (KTH) in Stockholm, Sweden when it comes to development of the faculty, curriculum and pedagogy. The faculty development activities, which use courses for the faculty as a tool for long term institutional change, will be described together with the underlying principles. Curriculum development at KTH has to a large extent been driven by the CDIO (Conceive, Design, Implement, Operate) initiative. This is an initiative that aims at changing engineering education so that disciplinary knowledge is taught hand-in-hand with system understanding and professional skills such as team work or ethics. Finally, problems and success in pedagogical development will be illustrated by an example where traditional lectures were turned into interactive learning sessions using the method Peer Instruction (Mazur 1997).

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Fredrik Lundell combines a position as Professor in Experimental Fluid Mechanics with the position as head of the Higher Education Research and Development unit at Royal Institute of Technology, Stockholm, Sweden. He works with fluid physics from theory to applications. The problems range from fundamental problems such as how particles moves in different flows to direct applicable work such as novel assembly techniques for biobased materials. Originally a pure experimentalist, he know uses a combination of experimental, numerical and theoretical approaches. The experimental techniques that he use include magnetic resonance imaging and synchrotron radiation. Furthermore, teaching and learning has always been a special interest. In particular, he works on implementing interactive teaching methods and cleverly designed learning activities to achieve deeper learning and increased interest in the material.