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## Pedagogical Innovation: the UTC formulæ

The key guidelines for pedagogical innovation implemented by UTC aim at ensuring the students become the actors of their personal learning process. This calls for collaborative work on real, scale-one problems, also for reverse educational lectures and serious games. The aim is not only to better arm our student-engineers to face their future professional career but also to adapt the university to comply with the specific features that characterize a new generation of undergraduates.

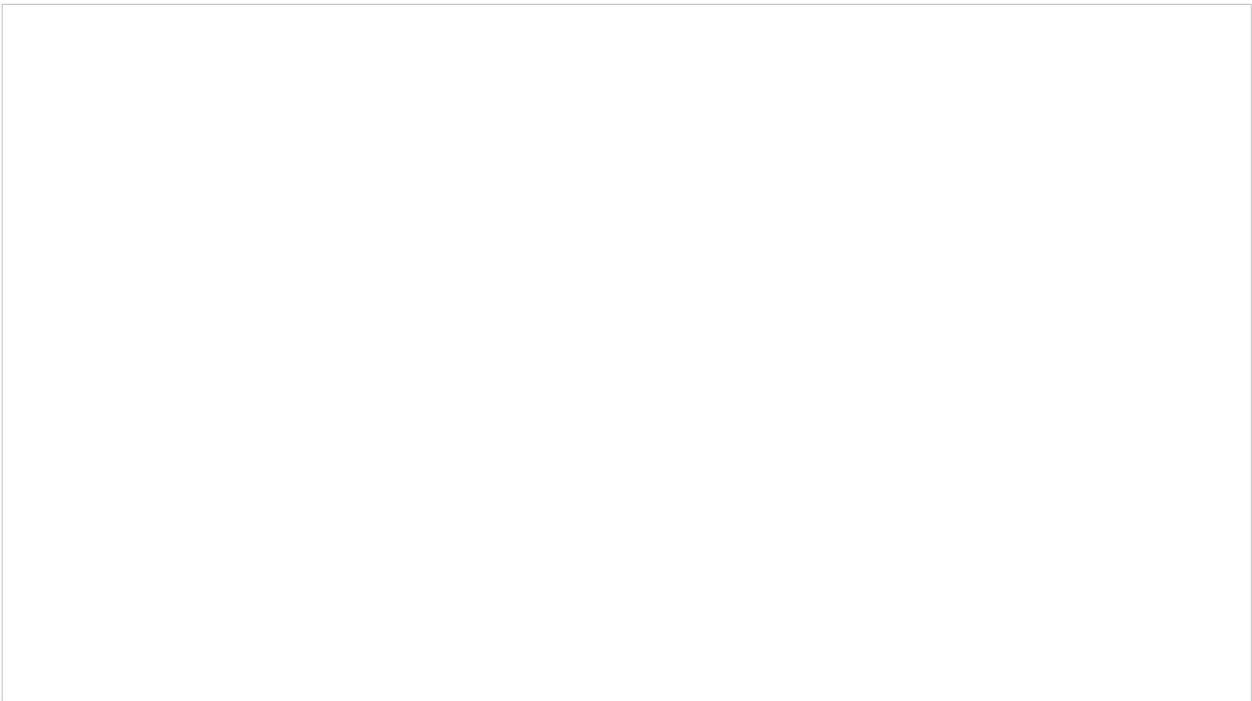
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## In the shoes of a supply chain manager... or those of an academic

In the CC on Supply Chain Management, in the department of mechanical engineering, there are also some striking and successful innovations, such as organizing a serious game as an examination, with the student-engineers lecturing their academic mentors



The end of year period is both game-oriented and serious for students registered in the Supply chain management CC. Dec.21, 2017, they will sit their course exam organized as a serious game, lasting one full half-day. Each time will be required to simulate the supply chain of a company producing small, artificial Xmas trees as decorations: this involves negotiating with the suppliers (roles played by students in a competing team, production and stock management, delivery to the shops... but also sales of the Xmas trees to customers with highly variable profiles, roles also played by other UTC students and personnel.

From supplier behaviour to customer satisfaction, not forgetting labour, storage and transportation costs, the teams participating will be assessed on their global performance. A game rounds up a semester, because in order to model the supply chain of a company, each group must first define the chain and hand in three successive status reports explaining their choices and methods.

### **Results transcending expectations**

The game, initially 'designed' by the academic in charge of this CC, Joanna Daaboul, was tested for the first time early 2017 with a previous class of students. *"My CC relates to optimism a complete supply chain, from procurement of raw materials to delivery of the finished end-products to customers"*, explains lecturer Daaboul. *"Between the two extremities there are numerous stages that require fairly tough mathematical skills: the definition of procurement strategy, factory and assembly locations, warehouse siting, sales outlets, transportation of goods and materials, demand forecasting, price setting... In each of my lectures and seminal classes, we focus on just one of the stages: we do not have enough time available to discuss their interconnections. And yet they are all interdependent. If, for instance, we choose to make and sell a cheap product, we must necessarily compress as much as possible all the intermediate cost elements of the chain. Our game allows students to become aware, in concrete terms, of how each decision affects all the others"*.

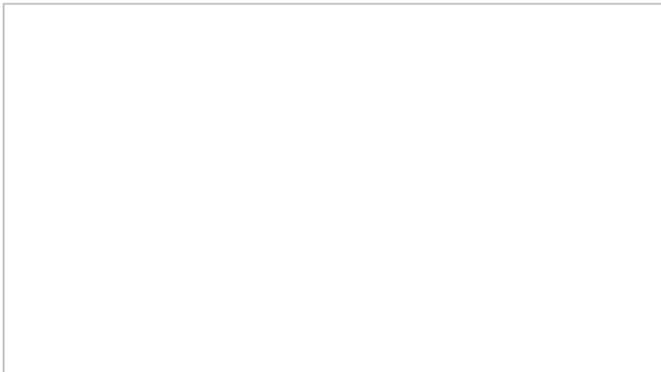
The game also offers a very motivating way to learn. *"Before, I used to assess the students on a single case study question, drawn from one, occasionally two, chapters of my course"*, adds Joanna Daaboul: *"for example, a question about localizing factories and warehouses. Most students found the exercise tedious and that led to the idea of the game. The results exceeded my expectations. Preparations took 5 times more work than just doing the case study exercise, but they found the workload lighter. They really get involved in the game, doing some calculations I hadn't even required ... they are more attentive and more active in classroom formation"*.

### **En route for 'reverse pedagogy' examinations?**

Yet another innovation: just as this issue of *Interactions* goes to press, the students registered for this CC are invited to experiment a flip-class configuration, managing and proposing a course on product pricing strategies. *“It will provide a way to teach them how to sift through and sort out information from scientifically “reliable” sources; preparing a two-hour lecture needs a lot of prior documentary spade-work to be done beforehand”*, underlines Joanna Daaboul. *“Moreover, in a very fast-evolving world, the younger generations can also contribute and offer their skills/talents to the academics. If their lecture is deemed excellent, I promised the students I would integrate certain sections in my own course, quoting tem as authors, which is an extra motivation for their work. Following this, and if the experiment is satisfactorily concluded, I would like to extend the principle to others course and even test flip examinations, where the students “build” the exam contents ...”*

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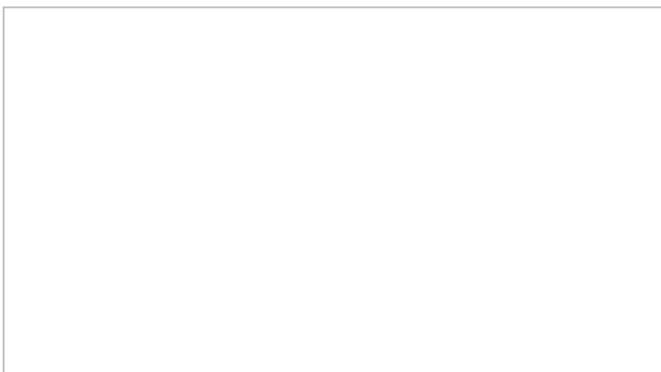
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