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An Authentic Learning Strategy for Engineering Students to Acquire Integrated Management Competences

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Students and staff of the minor 'Management in a High-tech Context' at Delft University of Technology reported a lack of integrated learning opportunities in the programme. The minor offered separate courses on financial management, human resource management, innovation, etc., but was not successful in integrating the different courses into a meaningful whole. As a result students lacked the opportunity to coherently understand and apply the competencies taught in the programme. For that reason an integrative course was developed. The design and experiences from three editions of the course are presented in this paper.

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The problem at stake is: what learning strategy is suitable to integrate the different competencies as acquired in the different courses of the minor 'Management in High Tech Contexts' into a meaningful whole? In this paper we study the authentic learning strategy, since it provides learners with a meaningful environment to coherently understand and apply knowledge and skills. The intention was not to develop a formal test to see if this integration had taken place in a satisfactory way, but to use a qualitative approach and build on the perception of the students as the main source of information.

In spring 2012 we evaluated three editions of the new integrative course that was designed to meet the objectives that were raised by students and staff members three years earlier.

The aim of the integrative course was to enable students to combine and apply the gained knowledge in such a way that they would obtain a better and coherent understanding. This course should provide the conditions needed to experience this understanding. The pedagogical design was built on several learning theories and new insights related to the use of media for learning. The authentic learning approach is the context in which this design has been materialized, hoping that the approach would allow for the different competencies to develop into a meaningful whole. The design principles for such an authentic learning environment are based on so called 'real world' settings in which students collaboratively create genuine products that are polished and professional, and that are shared and published. It is about knowledge in realistic contexts, realistic and complex tasks, using technology-based cognitive tools like in this setting social media and a serious game.

The course consists of two learning cycles: a management consultancy cycle and a general management cycle. The consultancy part is based on yearly varying assignments from real companies in our network. The management part is executed using a general management simulation game in an authentic office setting. For the communication between all participants including the representatives of the company who supplied the real world case, was done using a social media tool and the institution's Learning Management System.

The evaluations over the last three years show that the course solved most problems reported earlier. In particular, the choice for the authentic learning strategy contributed significantly to the integrated, deep understanding and application of management competencies. An important drawback of the actual approach is the time required to organize and teach the course. Our conviction is though that the approach would be widely applicable if the conditions such as 40h full-time time investment for the game week; self-organisation, group work, etc. could be refined and reduced in time.

The paper covers the experiences with the authentic learning strategy, the practical issues and the evaluation results to, as an overlying objective, augment the discussion on designing engaging learning environments using different pedagogies and technology-based tools. ■