

Industry participation in teaching - An example

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Abstract—Industry participation in teaching is often appreciated and inquired for by many students as it connects theory of academia with the reality of practitioners in industry. However, the industry involvement is often delimited to occasional guest lecturers or study visits and as such, it supplements the traditional, academic, teaching activities. The course, which is the subject of this paper, provides an example where the reality of industry is put in the first place and where traditional lectures provide a supplement. This paper describes a case where the industry involvement clearly promotes students' motivation and performance, and consequently, fosters the learning process.

Index Terms—industry, motivation, role-play, teaching

I. INTRODUCTION

THE course that is subject to this paper is based on a role-play where students are assigned for a realistic project case by a professional representative from a local company. The dialogue and interaction between students and their client take place at weekly project meetings at the clients' offices. The academic teachers of the course support the students in their project assignment and act as personal guides rather than traditional teachers.

The purpose of this paper is to present an example of how industry professionals can be actively involved in a course and how that contributes to the establishment of a learning process with highly committed and motivated students. The paper presents the fundamental outlines of the course and its pedagogical idea. It concludes with a discussion about the positive aspects, as well as the difficulties, of industry involvement in teaching.

II. OUTLINE OF THE COURSE

The course in question is named Construction Management, which is an advanced course in the program of civil engineering at Lund Institute of Technology. (www.bekon.lth.se/swedish/education/Undergraduate/VBE040/).

The course is founded on three parallel processes:

- The project process
- The education process, and
- The evaluation process

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A. The project process

The project process is the core of the course as it holds the principal task that is to be conducted by the students, i.e. the project. The basic pedagogical idea is to run the project process as a role-play between students and industry professionals. Each group of students establishes a fictitious construction management company with a name, organization plan, business concept etc. As construction managers, they get assigned on a project by a building client who is represented by an industry professional from a local construction related company. Each group of students has their personal client. The scope of the project holds the planning stage of a new housing project at a real-estate unit located in Lund. The project assignment is close in touch with reality as the real-estate unit is real and the planning process is actually in progress.

The course leader provides each client with a common description of the project case. Thus, there is a common framework of the project case for each client, and consequently, each group of students is given the same prerequisites. However, each client is free to present personal guidelines of the project design based on the company characteristics of the client, e.g. to focus on low cost housing, homes designed for the elderly persons, student's lodgings etc. Consequently, each group of students will follow the same project process but will end up with different project results.

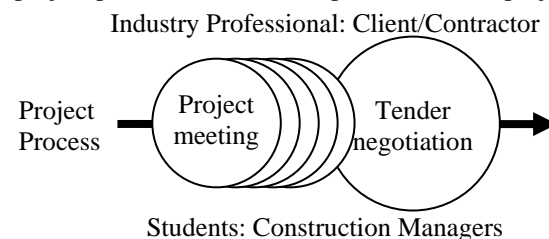


Fig. 1. Project meetings during the project process.

The project assignment is carried out in dialogue and interaction between the students and their client and is organized by formal project meetings with agendas, meeting minutes, contracts etc., as part of the role-play, see Fig. 1. The recurrent interaction with the client is complemented with a tender negotiation at which each group of students negotiates with representatives from two different contractors.

The project meetings take place at the workplace of the client, i.e. outside of the traditional school environment, which significantly contributes to the realistic atmosphere of the case.

Knowledge areas of previous courses constitute the starting

point of this course. Understanding of the integration between previously isolated knowledge areas is central to the accomplishment of the project process and constitutes an important learning objective of the course. Referring to Bloom's taxonomy, [1], the course aims at the level of analysis or synthesis, i.e. a level where the students are required to think critically and in depth.

B. The education process

The education process provides input of new knowledge areas, not considered in previous courses. The educational process consists of traditional lecturers that supports the various activities of the project process, see Fig. 2. Each lecture is synchronized with the activities of the project process and thus, the students require the knowledge from the lectures to conduct their project. The fact that the students recurrently will face the client in person and report their project results is expressed as a strong motivating factor for the learning process.

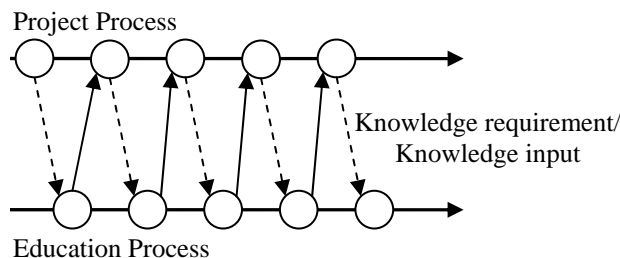


Fig. 2. Interaction between the project and educational processes

The lecturers are conducted by academic teachers as well as guest lecturers from the industry. Examples of lecture subjects are: team work, teambuilding, group-assessment, presentation technique, negotiation technique etc.

C. The evaluation process

The evaluation process, which runs in parallel to the project and education processes, aims at getting the students to reflect upon their own learning process as well as the learning process of their group. Each group describes the plan, results and conclusions of their evaluation process and this constitutes a mandatory part of the examination besides deliverables from the project process. The evaluation, carried out by the students, is complemented with continuous feedback from the professional clients and the academic teachers. The formal part of the role-play during project meetings is concluded with an informal part in which the client gives direct feedback to the project group.

III. DISCUSSION

The evaluation of the course shows that it is highly appreciated by the students and the main expressed cause for this is the connection with reality. Representative quotes from the CEQ-evaluation from 2005 illustrate this fact: “-The connection with reality, something that is really missing at LTH”, “-That you for once could apply what you have learned in other courses.” (www.ceq.lth.se).

The conclusion made about this course is that industry

involvement in teaching clearly promotes students motivation and performance, and consequently, fosters the learning process. Reference [2] claims that the motivation to learn will increase if the student realizes the value of knowledge, and refers to [3]. In the course in question, the students are in the final stage of their university education, and they experience an obvious desire to learn about the requirements of the working life of industry, that they soon are about to enter.

Reference [4] identifies a motivating factor in placing the teaching location outside of the traditional educational institution. The fact that a significant part of this course takes place outside of the school area, where the students and the professional clients meet at the workplace of the client, strongly contributes to the sense of realism and the motivation for the students. However, the considerable industry involvement also constitutes somewhat of a difficulty from the university teacher perspective. As a teacher you have to accept that you must leave some of the initiative and control of the course into the hands of the industry representatives. As a consequence, the project cases need a profound description and clear instructions, to convey the learning objectives of the course to the industry representatives. A well established communication with the industry representatives during the project process is also required.

Another possible question of the course, or perhaps possible criticism, is whether the course provides new theoretical input or if it represents a strict vocational training. As mentioned earlier, the course principally rests upon theoretical knowledge presented in previous courses, which are applied in a new context. As such, the course aims at bringing the learning perspective to a higher level of Blooms taxonomy [1]. Besides, the educational process provides input of new knowledge areas that are relevant for the project assignment. It is construction management that represents the expressed learning subject of the course. However, the students will also learn unexpressed matters as a direct consequence of their interaction with industry. They will practice how to act professionally, how to communicate, how to present, motivate, explain and promote their own work.

The outlines of this course ought to be applicable in other courses as well. However, the role-play and the connection with industry somehow require that the learning subject has a clear connection to reality and that the students have sufficient knowledge from previous courses to rely on.

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