Co-producing knowledge with industry

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Abstract—At Lund Faculty of Engineering Industrial Engineering and Management, we co-produce knowledge with industry in one of our ending courses Industrial management. This paper explains how we at the university designed, “delivered” and examined this course with the main stakeholders: students and managers. The purpose of this paper is three-fold. First, to present an elective synthesising course this is ending the specialisation Business and Innovation. This course is focused on the theory and practice of Industrial Management and using authentic industry collaboration as one of the main learning approaches, method and examination format. Second, to give insight into the different learning objectives that the course addresses and describe how we together with industry have designed and tailored the learning modules in order to promote the best learning possibilities for the industrial engineering students. Third, to present some findings from this synthesising university course focusing on co-producing knowledge with industry.

I. INTRODUCTION

There is a growing interest in describing and measuring the effects of university and industry knowledge collaboration and knowledge sharing [1-2]-[3]-[4]-[5]. Since many years we at the Faculty of Engineering (LTH), Industrial Management and Logistics, Lund University, Sweden has been working with industry and public organizations as collaborating and innovative partners in several university research projects governed by Per Odenrick, LTH (e.g. www.kraftprov.se) as well as in the academic courses [1]-[4].

At the end of one of the programmes at Faculty of Engineering (LTH), Industrial Engineering and Management, in the specialization “Business and innovation”, we have fully integrated and innovated on (an often student requested demand) the challenging and interesting industry collaboration (i.e. intervention) [2]-[4]. The main purpose of the Industrial Management course, which this paper addresses, is to co-produce new original knowledge in the industry assignments that has been suggested and provided by the managers in industry and other organizations. This academic course assignment is carried out together with industrial managers in several companies and organizations from mainly the south of Sweden every year.

II. PURPOSE

The purpose of this paper is three-fold. Firstly, to present an elective synthesising course which are ending the specialisation Business and Innovation. We are using existing and new knowledge in the field of industrial management and innovation in alignment with industry assignments as the focal conceptual approach, method as well as an examination format. Secondly, to give insight into the different learning objectives that the course addresses and describe how we together (i.e. the faculty & industry stakeholders) designed the different learning modules in order to promote the best learning challenges for the engineering students. Thirdly, to present the main findings from this university course focusing on co-producing knowledge that resulted in various knowledge and competence contributions (i.e. effects) on all the participating stakeholders and mainly the students.

III. COURSE OBJECTIVES

The course objective of Industrial Management is to create synthesized knowledge and competence in the field of Industrial Management (incl. leadership & strategic/corporate entrepreneurship) for the participative students. The course build upon the earlier courses within the engineering program at LTH and, in particular, the final specialization “Business and Innovation” with the purpose of both elaboration as well as integration of the acquired knowledge. The course pedagogical format is derived out of and built upon the earlier pedagogical and examination formats used in the other courses within the specialization. These courses are Technology strategy, Business Marketing and Applied Business Analysis.

IV. COURSE DESIGN

The Industrial Management course has further been designed in order to both capture and bridge the student’s interests in both technology and business with a particular emphasis in applying the used theories/models/concepts in practice. The course design is based the following four (4) learning modules which as a whole is the conceptual framework used in the course.

A. Industry management challenge
B. Theory in practice
C. Individual competence development
D. Individual reflection

Out of these learning modules, three of them (A+B+D) are included in the course examination. We have in 2009 added module C in order to get the students more aware and
proactive about their unique individual capabilities of functioning as industrial employees and managers in the future. Below is a description (i.e. mini introduction) of the four learning modules:

A. Industry Management Challenge (IMC). This first course module provides the main learning challenge for the participants (both the students but also the managers). In short, the students are provided with a wide range of authentic industry project (i.e. assignments) that they, as “consulting teams”, will problemizes, decide upon a distinctive approach and “solved” during the course (last for seven weeks). The company assignments vary from e.g. formulating and conducting marketing research, designing an internal ICT-technological platform/network, developing alternative action plans for future company and organization development. The key to this is that the managers present their “unique industry need” and then the students individually choose the industry challenges that interest them “as professionals”. They are then, by the course staff, selected into several multi competent consulting teams after answering a mini survey on the unique competences. The industrial management students is within the course objectives given full responsibility in acting in the role as junior management consultants (i.e. JMC:s) in this module in order to fully practice their knowledge in authentic problem solving in industry and public organizations. The overall governing and responsibility of all the industry projects is managed by the faculty (i.e. staff) of the course. This first module is at the end of the course, “delivered” (i.e. reported) in both a written and orally formats.

B. Theory in practice (TiP). This second module is focusing on the conceptualization of Industrial Management mind sets which has relevance (as well as gives valuable perspectives to) on the industry projects in practice. The student teams obtain in the very start of course literature, which they then collective critically evaluate and review its main theoretical and especially the practical contributions. They then take their knowledge of the literature and develop their understanding into an “internal knowledge seminar” which they, as a team, deliver in the class as a whole. The participating mangers and other company representatives are invited to these knowledge seminars. After each TiP-seminar there is held a reflective debate of how they, as “junior consultants” understand and apply this new knowledge in particular in their industry assignment and perhaps also in some of the other industry projects that are involved in the course.

C. Individual competence development (ICD). A recent added third module (2009) is that the individual student are invited to voluntarily participate in a tailorized assessments surveys with the main purpose to assess their individual current and potential in functioning as industrial managers. At the end of this module, which is carried out during the course they are given both written and oral feedback from staff.

D. Individual reflection (iR). The function of the fourth and ending module is to help the individual students to, in dept, personally reflect over their individual and often various learning’s (i.e. regarding both course content as well as group process) that they have gained and experienced during the course. The writing format of this reflection is in the format of an “article” that they write and then send into a tentatively “publisher” (in this case the course staff) for a monthly magazine focusing on engineering in practice. Then they will be notified if they get their article published or not (i.e. accepted).

V. LESSONS LEARNED; STUDENT PERSPECTIVE, MANAGER’S PERSPECTIVE, AND FACULTY PERSPECTIVE

Here we will discuss with you some of the main learning’s from students and managers/clients at EFL Executive Foundation, Lund, Malmö Burlöv Golf Club (MBGC) and Academic Search.

The module that the students appreciated mostly was module one: Industrial Management Challenge (IMC) .The students confirmed that the company assignments gave them a close connection with industry and insight to practice industrial engineering and management. They also said that, besides using their capabilities in problem solving, they also tested their abilities in working in larger teams with planning and organizing the independent work assignment. Capabilities as their creativity and fantasy was also much appreciated by the industry clients in order to fully meet and satisfy the high demands in the projects. They also appreciated the individual reflection (iR) task because this gave them a personal opportunity to reflect over how what they as an individual has learned. They also stated that this was a challenging examination format. The students concluded that the Industrial management course provided them with a perfect final course at the faculty of Engineering in Lund.

The Head of the Board (MBGC) Tony Åkesson said when he was asked about the main contribution for the companies of this collaborative student project: This project has given us a new and deep understanding of the focal issues and it has also given us a “language” to better understand what is necessary for revamping our company in order to address and meet our vision and objectives that is needed for the future. The actual report has also contributed to that we now have a fine documentation to, in the near future, better communicate the strategic issues [6]. of the needed changes in the board and also with the other stakeholders that is involved.

VI. FUTURE CHALLENGES

In this section, we want you in the audience at this LTH-conference, to together with us, also identify some of the future challenges in innovating on this learning framework! Let the discussion begin!
VII. ACKNOWLEDGEMENT

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REFERENCES


