Course Analysis

MF2085 Innovation- and Product Development Processes 6.0cr

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1 Course information

The course in Innovation- and Product Development Processes is a practical course that involves different theories and frameworks for innovation and product development processes, such as NPD stage-gate, agile development, design thinking, Lean start-up, circular economy, etc. Students will become skilled in utilizing these methods and get an in-depth understanding of how these models and work methods can be skillfully applied in several critical situations in innovation and product development such as when improving both efficiency and innovation, managing both incremental and radical innovation or going from offering product to product-service systems and adapting to digitalization and a sustainable development. Learnings will be based on how students relate to the course literature and reflect it in a case assignment called 'Continuous Learning Assignments'. Students will perform a project in which they apply the theoretical models and frameworks that have been introduced throughout the course as well as throughout the courses MF2084 Managing Research and Development and MF2046 Product Innovation. The project concerns an analysis of a specific innovation or product development process in an organization, and to suggest a new or how to improve existing process design in the format of a management consulting report.

Course responsible teacher:

Susanne Nilsson

Other teachers in the course:

Sofia Ritzén

Examiner:

Sofia Ritzén

Learning activities:

The course is carried out in smaller groups for the project and individually where all the students work on learning assignments. In addition, the seminars consist of a mixture of lectures by invited guests from the industry or by the teachers in the course and of discussions and exercises in smaller groups related to theories and frameworks for innovation and product development processes.

The students lead and execute the project while learning about and understanding the principles and tools for the analysis, design and implementation of innovation and product development processes.

2 Students' view of the course

Summary of students´ view of the course based on for example LEQ survey and/or interviews or other activities.

Brief summary of students' responses from the feedback session in the end of the course:

The course feedback reveals some of the main challenges in the course. Students felt the engagement of the other students in all the lectures and discussions were not sufficient since the lectures were not mandatory. The efforts they put in reading the course literature is not equally contributed and hence the discussions were not intensive. On top of these challenges, students felt like there were more papers to read initially for the continuous learning assignments. But later, the course literature was informative for their learning assignments and the project work as well. On the other hand, the students found the project work to be intriguing as it is more industry-oriented and the guest lectures helped them approaching the companies and identifying their problems. The workload is distributed well enough for the students to manage with other courses as well. Students liked the idea of having the grade points from the continuous learning assignments in their final exams.

3 Teacher analysis of the course

The following points are compiled from the LEQ with reply rate of 47 % (15 answers of 32 fulfilling the course (35 registered)):

- Student report quite large variation in workload in the course, no major concern about the workload.
- On an average the survey shows medium to high agreement to the propositions in the LEQ. Female students have a noticeably higher agreement on all propositions (except one where they have the same).
- Appreciated aspects or activities of the course are: the project, the CLA, guest lectures, seminars and the requirement to read literature before the seminars, and the topics of the course.
- Aspects that students bring up for which they would like to see a change: more clarity on expectations on some CLA, less reading, the course schedule could be more focused and with less assignments of the side, support to each group and clearer directions regarding writing a consultancy report.
- Another aspect brought up is the unequal ambition level of students that decreased the quality of seminars for students with high ambitions, mostly revealed in discussion sessions where some students came unprepared and some came well prepared.
- Students' recommendations to other students are in summary:
    - start with the project early and make early contacts with companies,
    - spend time on CLA and on reading, however, not every seminar and CLA is critical for finalizing the course.
- There are a number of very positive statements on the course (e.g. most interesting course ever taken), one student being disappointed and some addressing certain seminars as being more or less interesting and/or valuable.

We also asked specifically about seminar attendance as we had noticed that just above half of the class attended all seminars and quite many did attend very few times. Those attending mainly appreciated the group discussions, the guest lecturers and different exercises. Those not attending many seminars tell that it was due to collision in schedule, they did not want to read beforehand or that seminars were not compulsory.

Based on the LEQ, the students' reflections in this document, discussions with students and our own analysis and reflection during the course we draw the following conclusions:

The course format fits many students and those that prioritize the activities also give very good feedback on the course. Some students do not attend seminars, possibly just because they see that they are not mandatory, possibly because the format does not fit them. We still believe the format is important for engaging students and activate them in their own learning. Also, we see that exercises and activities during seminars are practicing skills we believe are important. Why we have this particular format of the course could be communicated stronger and we can advocate harder for students to try out the seminars and also invite them in taking part in developing them.

CLA's are appreciated and make students study during the course. CLA's will be used again.

The project is highly appreciated, and we have already increased the number of credits associated with the project in the present course plan (2 cr → 3 cr) as we see that it better represents the workload. Also, we will strengthen the feedback to project groups and give clearer directions regarding what is expected from a consultancy report. One issue we have to consider further is that we have encouraged students to get in contact with us if they are in favor or supervision during the project, but we are seldom contacted. It might be that we have to push for supervision instead of offering opportunities.

We are also recommended to be more precise from the beginning regarding reading assignments and CLA's and we will look into if that is appropriate. However, setting all details from the beginning also restrict teachers to be flexible during the course which can be a disadvantage.

We are still working on the issue of how to manage with different ambitions among students and that their preparations differ and consequently affects the quality of the seminars. For the next course round, we will not have pre reading for all seminars but for those to which a CLA is related, and we will possibly connect oral examination to CLA's.

Course context

In comparison to a number of other research-oriented courses at KTH, the present course has a higher degree of skill-based learning objectives. At the same time, the number of students is the largest or one of the largest in the master's programme Integrated Product Development. Size alone is factor that should be considered for the particular set-up of practical activity-based learning that the course is designed for. While size is less of an issue for more traditional courses, the more activity-based learning the course contains the more size becomes an issue.

Adding to the challenge of size, the students in the course are also the most heterogenous of the courses in the master's programme Integrated Product Development. Students come from two different programmes at KTH – the CDEPR programme and the CMAST programme and they attend the second term of two different master's programme tracks – the Industrial Design Engineering Track and the Innovation Management and Product Development Track. In addition, there are several students from other universities, both foreign and domestic. This heterogeneity makes the students have very different prior skills. For instance, one programme totally lacks knowledge of statistics and has a lesser focus on coding in their Bachelors.

Changes of the course before this course offering

We added CLA and made them correspond to points in the home exam.

We invited more guest lecturers.

We inserted more variation in different types of group exercises.

The course's strengths (based on the students' experiences and the teacher analysis):

The course is valued by several students as the students were able to use the learnt theories and frameworks for innovation and product development processes in the project work and the learning assignments. It has been described as a properly structured course with the adequate learning objectives. The guidance and support from the teachers, and the guest lectures were very useful which made the challenging areas to be more attainable.

The teachers believe strongly in also putting students into situation where they have to plan themselves and make priorities and drive their own progress forward, for instance in project work.

Areas for improvement of the course (based on student experiences and teacher analysis):

- Students do not contribute equally to the discussions (oral examination/discussions in groups)
- Too many articles to read and not sure which ones will be used.
- Introducing additional interactive elements to make students more engaged in the lectures
- Clarity about project report expectations
- Demanding students to ask for project feedback

Proposed changes to the next course round:

- Adding mandatory activities to the seminars so that all the students contribute equally to the discussions (oral examination/discussions in groups)
- Communicate why the course has its particular format and advocate harder for students to participate in seminars and also invite them to take part in their development.
- Reducing the number of mandatory articles in the course literature and provide guidance on which ones are mandatory to read before a certain seminar and which are for home exam
- We will communicate even stronger that we schedule for project feedback.
- Project correspond now to 3 cr instead of 2.
- We will add one CLA and reduce length of home exam.
- We will be somewhat cautious of defining each step and expectations as we will then loose some of the things, we make students practice in this course, such as planning in advance, taking responsibility of their own learning and progress, actively reflect and more. These things are important in designing and evaluating innovation and product development processes.