Facilitating Interdisciplinary Collaboration in Student Teams

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Background

Being able to collaborate with people from different disciplinary backgrounds becomes increasingly important. The (future) challenges that are awaiting our students are very complex and require input from different fields of knowledge in order to be solved. It is therefore of pivotal importance that our students learn to collaborate with people from different disciplines. Universities offer the opportunity for future engineers to experience and experiment with interdisciplinary collaboration in a safe environment that fosters learning and development of students.

Although interdisciplinary collaboration can be very successful, there is abundant research that underlines the difficulties of working with people different from oneself. For example, conflicts are likely to emerge, distribution of tasks and responsibilities can be extremely hard, information sharing and learning might get hampered, and planning and coordination might fail. The question thus is how to facilitate interdisciplinary collaboration in the educational setting? We expect tutors to play an important role in facilitating the collaborative processes in multidisciplinary teams. When students are uncertain how to behave, it is likely that they will heavily rely on the guidance of or on example set by the tutor. Tutors can help to formulate the potential value of interdisciplinary collaboration for the team, but they can also manage students' expectations by sharing own experiences. Furthermore, tutors can actively monitor manage teamwork processes. We aim to design an intervention guideline for tutors.

The course 4WBB0 Engineering Design offers a perfect environment for this investigation. Engineering Design is a course in which all 2nd year TU/e students participate and in which they collaborate in interdisciplinary teams to create something new. All teams have a tutor and tutors need to facilitate the design process, to support, and to motivate their teams. All teams have 11 meetings (tutor included), which makes it easy to distinguish between early-middle- and late stages in the design project, which are natural points in a project team life cycle for a tutor to intervene when necessary.

In the future, we think the developed and validated tool can be easily implemented in other courses that require students to collaborate in highly diverse, interdisciplinary teams.

Objectives

The overall goal is to gain knowledge on how tutors can facilitate the collaborative processes in interdisciplinary student teams and to develop a tool that guides tutors in their role as team process managers. In this project, we are able to test and evaluate the face validity of the tool by using experts (researchers) and users (tutors). We will disseminate the tool to the tutors online.

Project design and management

Timeframe: 1 year: May 2018 - May 2019

1. The first step is a literature review on high performance teams to identifying the key interventions tutors can employ when necessary.

2. In the second step we will create the tool. We will make a distinction between the start, mid-way, and end phase of the project. For each phase, we will describe team processes of high performance teams (ideal situation) and identify small interventions (behavioural strategies) tutors can use when their team is struggling. Experts on interdisciplinary learning will be invited to give their expert opinion on the tool, after which it will be revised if necessary.

3. The third step is about pilot testing and evaluating the tool. The tool will be offered to tutors in the 4WBB0 course on a voluntary basis. The collaborating tutors will also fill in a short survey three times corresponding to the three phases of the project, so we can assess whether they find the tool useful and user friendly. Based on these data, we will evaluate the tool and decide whether it needs further adjustments.

4. The fourth step is to design a field-experimental study to empirically assess whether using the tool indeed increases collaborative processes in and performance of interdisciplinary teams. Executing this field-experiment is planned for the academic year 2019-2020 and falls beyond the scope of the current proposal.

Task	May-June	July-Aug	Sep-Oct	Nov-Feb	March-May
Literature review	▓	▓			
Tool development	▓	▓			
Face validity of tool & adjustments		▓			
Pilot test; data collection			▓		
Evaluation & design experimental study				▓	▓
Disseminate					▓

Dissemination and sustainability of the project
The lessons learned in this project may directly spark developments for other courses at the university in which students are required to work in (highly) diverse teams as well as for courses at other universities (e.g. Wageningen, Twente, Delft). Via our contacts at those universities, we will disseminate our insights. We will write a report on the key lessons learned from the project and present these in one of the education lunches regularly held in both M&CS and IE&IS. Furthermore, we intend to execute the experimental study in the 2019-2020 academic year.