Enhancing Non-technical Skills in Engineering Students - Evaluation of a Concept

Authors: Christin Lindholm, Christian Nyberg, Johan Swahn

Abstract: For students to have a successful career in engineering, they need both technical engineering skills and non-technical engineering skills. For the students, the technical skills are clearly presented and a natural part of course content and syllabuses, while the non-technical skills are more in the background. To systematically address non-technical engineering skills, six mandatory "Engineering Days" (Ing-dagar) was introduced in two engineering programs at Bachelor level. The students meet the concept of non-technical engineering skills through their three years of education. All activities are compulsory and take place within the framework of existing courses. The ability to communicate, to work in projects, handle conflicts, reason about sustainability, ethics, and the training to become an engineer are some of the non-technical engineering skills addressed in the concept. The concept has been evaluated by three cohorts of final year students (2021-2023) at the two Bachelor programs. The evaluations were done through an anonymous, voluntary paper-based survey. The result shows that the students experience that their non-technical skills have improved overall, especially work in terms of engineering, project work, time planning and sustainability. Discussions with thesis examiners indicate that the quality of the texts in the students' theses reports have generally improved since recurring elements of written communication have been introduced in the programs. The students have also become better at adapting the text to target groups. The ethical discussions included in the concept have been evaluated by a philosophy teacher at the university. The evaluation shows that all reviewed thesis reports contain an ethical reflection that is well-formulated and relevant, which demonstrates an ability of the students to identify relevant ethical issues and reflect on them. The survey also shows that the students agree that the concept and projects increased their competence and confidence in meeting their future professional role as an engineer. Considering this, it can be discussed and further surveyed whether the concept and the projects play a role in the students' motivation and successful transition to professional life.

Keywords: bachelor programs, concept, non-technical skills, projects

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