



Report on the SEFI Working Group Workshop (19-1):

Teaching Soft Skills for Engineers of the Future by Using Projects

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1. The Concept:

Workshop rational: Engineers work in projects and need certain soft skills to succeed in this work environment. Teaching soft skills to engineering students can be supported by creating project situations which generate a relevant learning experience. The workshop is intended for participants who want to look deeper into how to create such project situations in student projects.

Learning outcomes: During the one-hour workshop “Teaching soft skills for engineers of the future by using projects” participants will learn:

- How to plan, prepare and conduct agile cross-border projects with industry involvement for educational purposes
- How to select a relevant project case
- How to build the teams for project assignment
- Participants will be provided with:
 - o Template and example of the course concept with learning activities’ plan
 - o Template and example of the case study description
 - o Working template for the self-evaluation for roles identification

Concept and engagement scenarios: The workshop will have 3 parts:

- Part 1: project-based learning and agile cross-border projects,
- Part 2: roles and soft skills model, team formation and relevant exercises,
- Part 3: discussion and feedback from industry partners.

Part 1 description:

An introduction to the concept of agile cross-border projects [1] will be provided, including results of the ongoing research from students’ and trainers’/lecturers’ perspectives. During the session, participants get familiar with the course concept including the intended learning outcomes and the learning activity plan.

Part 2 description:

Introduction to the project case development [2] and know-how to refine and tailor a project case with companies for training soft skills [3, 4], as well as roles definition and team formation models and processes. Participants of the workshop will perform a role identification exercise based on Belbin's team roles [5]. After exercise the discussion will follow about matching their results with the Scrum roles.

Part 3 description:

- a) Discussion between industry partners and the workshop participants on impact of soft skills in ongoing projects, training strategies to develop soft skills of employees, as well as perspective of the industry on skills of “fresh” engineering graduates.
- b) Feedback and discussion about soft skills and personality traits [6] in order to train a desired set of soft skills.

Participants will be asked to assess and evaluate the concept; the workshop materials will be made available to all participants after the workshop (via cloud storage).

2. Results and Discussion

The workshop was attended by appr. 50 people (Fig. 1). After Part 1 on project-based learning and agile cross-border projects was concluded, the participants applied the Belbin’s test by their own with assistance of organisers (Part 2), and then in Part 3 we had a discussion and feedback from Siemens Digital Industries Software (Leuven, Belgium).



Fig. 1. Organisers and attendees of the workshop

From our point of view, the workshop was very relevant and interesting to participants. Particularly Part 1 arose a high interest of participants, and they were actively engaged in the discussion on conducting agile cross-border projects, and how they can replicate the same methodology in their courses.

Important to mention, Part 2 arose an interesting discussion about ending the use of the term “soft” as it sends the wrong message to students and lecturers, and other people in organizations. That because they are soft, it doesn’t mean they are less important. (You may be interested in reading a paper on a similar matter: *A hard stop to the term “soft skills”*, <https://doi.org/10.1002/jee.20442>).

The discussion from Part 3 also emphasized the need for higher education institutions to really focus on soft skills for engineering students. Companies are investing a lot to ensure that their employees possess both technical and soft skills. But there is still a need for higher education institutions to bridge the soft skills gap early enough in learning trajectories.

The participants were given the link to download the workshop materials, which can be accessed via <https://fh-dortmund.sciebo.de/s/jxS7plx5Do0Wlra>.

At the end, the participants evaluated the workshop. Although, the response rate was very low (16%), below you may find some interesting results, and insights (Table 1).

What is your role at your current organisation/project?

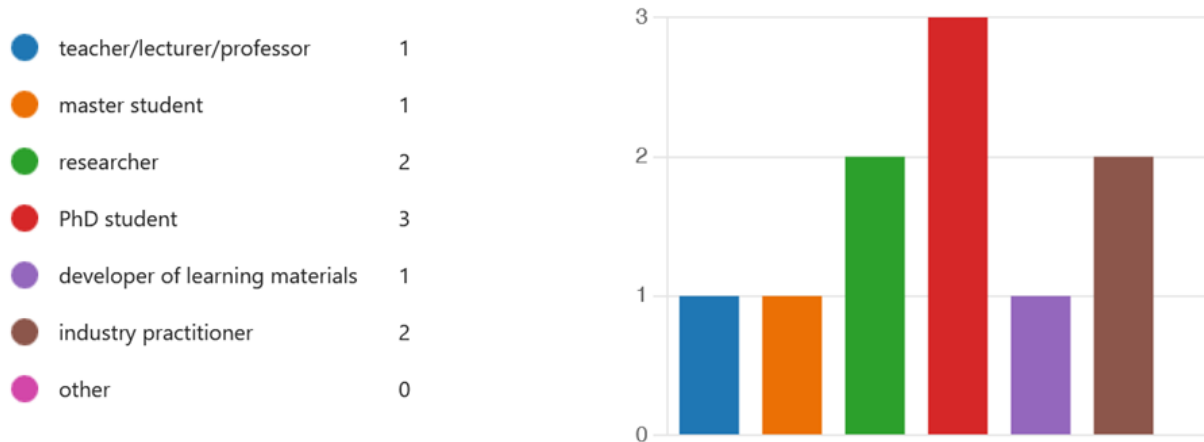


Fig. 2. Profile of respondents

Only 38% of respondents experienced special tools for assigning specific team roles to people in the project settings.

Table 1. Insights into means of soft skills' development

What were the means or approaches applied to train these particular deficit skills?	What would be your suggestions to improve soft skills development?
<ul style="list-style-type: none"> • Creative challenges, daily social conflicts between technical opinions encountered • Project-based learning on real-world problems • Meeting and collaborating with disciplines outside of mine • Through having sufficient knowledge about the topic • Practice 	<ul style="list-style-type: none"> • The implementation of more workshops and to invest on team working innovation on the industrial businesses • Learning by doing • Exposure to different disciplines early on in education • Make a lot of real situation practical experiences, even better do them in industry • A holistic understanding of how the whole enterprise functions • Project-based tasks within all subjects of the curriculum

3. Limitations

While organising the workshop, we were informed on appr. number of participants for the workshop as 20. Since we had about 50 participants, we did not have enough materials and capacity to help all participants with Part 2. At the same time, we were



positively surprised with this attendance rate, and believe that this shows a high demand and importance of our research and education focus.

Since the evaluation took place before Part 3, and due to the remark above, this limited the response rate of our evaluation.

4. Conclusion

If you want to help our research, and managed to check the materials via the link mentioned above, please fill in the evaluation/feedback form:

<https://forms.office.com/r/JfGg92HRAA>

Several discussions proceeded after the workshop, and defined future research collaborations. To conclude this report, we want to use one of the statements a participant shared: “*The development of soft skills is required to complement the development of technical skills.*”

5. Acknowledgement

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References:

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