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Transferable skills in student engineering projects

This interactive workshop will better equip participants to accompany student teams working on science or engineering projects in terms of the developing transferable skills. Students, and teachers, are often too focused on the final outcomes or product as deliverables and may neglect learning opportunities along the way. This workshop will offer participants a chance to explore 7 different skills sets that can be developed during authentic science and engineering projects. Making such skills explicit to students, and among a teaching team, can help to promote their development.

Survey data will be presented from 13 students who participated in the 2017 or 2018 EPFL teams for the project-based international Genetically Engineered Machine competition in synthetic biology (iGEM), among over 340 teams. The questionnaire consists of 43 items that address among others planning skills, risk assessment skills, ethical sensitivity of the project, communication and interprofessional competence skills on a 5-point Likert scale (strongly disagree to strongly agree). Students were also asked to indicate to which extent they have a sense of ownership of their project.

Students agree (3.8, $\sigma=0.8$) that they have learned a great deal of transferable skills with strongest being inquiry skills (4.3, $\sigma=0.6$). They report their risk assessment skills as the weakest overall (3.6, $\sigma=0.7$). When asked to list the 2 biggest difficulties, communication issues (2017) and technical issues (2018) were most frequently cited. In both cohorts, students reported having acquired skills to address similar issues in future projects (4.3, $\sigma=0.8$). Students report having acquired a higher expertise in the part they have personally worked on as compared with all the areas of the project (4.2, $\sigma=0.8$ vs. 3.4, $\sigma=1.0$) and a pronounced sense of project ownership (4.4, $\sigma=0.7$).

Workshop participants will leave with ≥ 3 concrete ideas to promote the development of such skills during student projects.