

# LESSONS LEARNED FROM AN INTERDISCIPLINARY INNOVATION CAMP FOR BACHELOR STUDENTS – BIOMEDICAL LABORATORY SCIENCE & COMPUTER ENGINEERING

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*Innovation camps are used in both schools and higher education as a method to teach innovation. In the bachelor setting, an interdisciplinary approach is fruitful for revealing and addressing the need for bridging the knowledge and culture gaps that most innovative processes in working life will entail. However, achieving engaged participation from two diverse students groups, without giving grades, requires that the setup pays careful attention to countering both distracting factors and includes up front preparations on how to deal with diversity. We report on our experiences from five plus years of Innovation camps for Biomedical Laboratory Science & Computer Engineering BA students.*

## 1. BACKGROUND AND MOTIVATION

As the need for innovation is widely acknowledged across sectors and countries, the how of achieving beneficial innovation for a sustainable society is addressed in various ways such as with funding, research programs, but also in the education sector. The Norwegian Qualifications Framework for Lifelong Learning (NQF/NOKUT) has innovation as a specified requirement in education. At the level of Bachelor (level 6) it is defined as a General Competence where: “*the candidate is familiar with new ideas and innovative processes.*» The challenge then, for our universities and university colleges, is how to achieve this rather complex issue in a manner that in the long run will contribute to innovation in the workplace and elsewhere in society. “*An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.*” (OECD, 2019). Although not explicitly stated, this implies that an innovation is more than an idea – it is also in use, producing benefit in some way, or it would not be seen as innovative. So the task implies, not only coming up with an idea for improvement, but also assessing the feasibility of sustaining the innovation as well as coming up with a design and its implementation, with the future users in mind. As such, real innovation relies on its implementers to bridge cultures and domains.

In the short run then, teaching innovation is about designing the learning activities teaching in a way that engages the students and spurs involvement, bridging interdisciplinary knowledge gaps to create something that would be innovative for a future user. This implies achieving competences in the high end of Krathwohl’s (2002) revision of Blooms taxonomy of learning outcomes, including synthesis and creativity, preferably addressing all levels of the knowledge dimension: the factual, conceptual, procedural and metacognitive. Any Bachelor study program, aiming for suitable employability within three years, must necessarily provide its students with a range of skills that will support them particularly in the early part of their career. As educators providing different courses, we often find ourselves competing for the students’ attention and effort. We have experienced that learning about innovation is not where most students feel they should prioritize their time. The basic professional skills of their chosen profession taking precedence.

We report on work in progress, based on five Innovation Camps 2015-2019 (three days: idea generation, feasibility exploration and competitive pitching) for two study programs of Bachelor students at NTNU. The camp’s objective is to come up with creative feasible solutions for a client/problem owner in a health context. The short time span of the camp brings particular challenges to the teamwork, both to motivation and ability to collaborate across diverse: \*) technical language and identity, \*) study habits and \*) work practices. Our efforts aim to provide the students with opportunities for learning about

entrepreneurship and innovation, while here presenting some insights gained through running an interdisciplinary Innovation Camp.

### Three intensive days in groups of six – the interdisciplinary Innovation Camp.

Our total student group has varied over the years – ranging from 94 to 137, approximately half from each study program. The Biomedical Laboratory Science study program (2<sup>nd</sup> year students) ran their own Innovations camps twice before deciding that it would benefit creativity and outcome of ideas to have engineering students involved. Our first interdisciplinary camp, including Computer Science students (3<sup>rd</sup> year) ran in March 2015. Due to difficulty of finding space (20 group rooms) for the teams' work, we spent the first day together in a lecture hall on curricular activities: Why Innovation in Healthcare; Why interdisciplinary; What is innovation (tech & use – and markets). This was interspersed with Team-building exercises, followed by Guest lecturers from the healthcare domain presenting general challenges and problems that need solving. The afternoon and the next day was spent on creative group work, gathering of information and deciding on a concept or idea, with a business model, to pitch. On the last day – the grand finale, the teams pitch their ideas for the jury and their competitors. Spending most of the 1<sup>st</sup> day listening to lecturers did not go down well!

## 2. METHOD

We report on our own experiences from course evaluation involving student representatives and the outcomes from students' surveys from 2015 to 2019. The four authors have been central to organizing the joint Innovations camps. The results have been used to improve on both practical issues as well as content and the organizing of the days. The student survey was anonymous, had a mix of direct questions, 3 value Likert scale questions and free text questions asking for suggestions and other comments. In addition, a Kahoot was used in the start-up teambuilding activity to engage the teams.

## 3. RESULTS

In order to reduce the competition with other study activities such as exercises and exam preparations we have closely followed the students' suggestions for improvement. We have also adjusted the organization of the Innovation camps over the years. Some issues to address:

- \*) Less lectures – do these beforehand.
- \*) Study programs differ – the health domain students need input on teamwork. The engineering students need to be aware – this is a situation of limited common ground – handle inter-disciplinary collaboration. \*) Facilitation of groups – 4 lecturers & 2 *NTNU Spark* teaching assistants & 2 *Ungt Entreprenørskap*.
- \*) Let also the students vote for winners. \*) Fun? Yes: 75–85%. \*) Recommend for future students? Yes, increases steadily: 63% =>78%

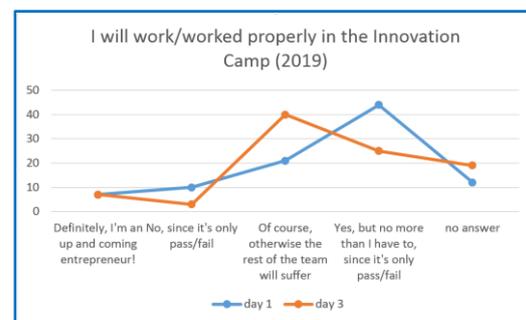


Figure 1 Student responses on motivation, improves during camp. (94 students, 2019).

## 4. CONCLUSION

The innovation camp as learning method gives the students hands on experience with interdisciplinary collaboration, innovation and entrepreneurship. They recommend we continue, and end up getting more involved and excited than they expected, as reported in a Kahoot question – see Fig. 1 Student responses.

## REFERENCES

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