Student Innovation Labs: in-company labs that boost innovation

Abstract:

Training professionals is different from training innovators. Bringing innovative thinking into the professional field is not what we train students for yet. Student innovation labs are meant to bridge that gap. These labs are situated within companies where multidisciplinary student teams work under the guidance of professionals, lecturers and researchers. Built on the ideas of several inspiring innovation programmes (d.school, innovation pedagogy), student innovation labs help student take on challenges with an interdisciplinary, designerly approach, within the context of an innovative company. Students work on both client projects and R&D for the company, and can take part in the university’s research.

The pedagogy for these labs is challenge-driven, building on instructional insights from the 4C/ID model and Challenge Based Learning. Lecturers, researchers and professionals have different roles as mentor, instructor or expert.

Student innovation labs have a different business case than other teaching methods like internships. Although more guidance is required, labs are more (instructional)time efficient than (most) internships and add more value to the company through R&D activities and more innovative solutions. And training students to be innovators can give future employers a competitive edge and allow universities of applied sciences to play a new role within their different professional fields.

As a university of applied sciences, training students to become professionals, fully able to take part in their professional field, is our goal. But having students contribute to innovation within this field, and beyond, is a challenge. It requires both professional mastery (what’s my profession about?) and an ability to see new perspectives to known professional problems (how else can we solve this?). In their professional education, students either experience a real-life work environment, for example during internships, or they learn about new concepts and work on innovative, practice-based cases in school.
Introducing student innovation labs

With student innovation labs, University of Applied Sciences Utrecht bridges that gap. Together with creative companies in Utrecht, the university creates in-company labs where work experience, interdisciplinary problem-solving and conceptual learning are combined. Students work on customer projects and are part of the company’s R&D activities. They are guided both by senior professionals and university teachers and researchers.

Helping students become professionals is one of the core tasks of universities of applied sciences. Students are trained to grow their professional knowledge and skills and are challenged to become cooperative and (yet) independent professionals.

Helping students become innovators is a different challenge and not part of most professional programmes. Dealing with change in both the professional field and in society and adapting to new situations are essential skills for a changing world.

Student innovation labs are created to train innovators. There are many educational programmes and models that put fostering innovation at the center of professional training, such as Stanford’s d.school in the United States\(^1\) and the innovation pedagogy of Finland’s Turku University of Applied Sciences\(^2\).

From these programmes, Utrecht University of Applied Sciences’ Centre of Expertise Creative Industry has distilled several key elements for educating innovators:

- Inspiring students to find solutions for **big challenges** and using **breakthrough technology**.
- **Collaboration** with professionals with different disciplines and different experience,
- Using a **designerly approach** to bring together different disciplines,
- **Linking projects to research** for creating solid concepts,

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And we’ve added one element ourselves:

- Educating students **within an innovative company**: there is no real substitute for a real learning environment.

Or, to put it differently: inspiring and innovative companies create student labs where students from different fields are coached by senior professionals to tackle big challenges through design thinking using the best that applied research and professional experts have to offer (see Figure 1).

![Diagram of student innovation lab](image)

*Figure 1: Student innovation lab within the company, with different learning support roles.*

**A pedagogy for student innovation labs**

In student innovation labs, student work is challenge-driven. Either through big client projects or research challenges from within the company or one of the university’s research groups focusses the student group. Students try to tackle the challenge in multi-disciplinary groups, learning and using design principles, bringing the problem into a new perspective, and designing an innovative solution (see Figure 2).

In the student innovation labs, learning is guided. Students work on complex learning tasks: concrete, authentic, whole task experiences in which either client projects or research assignment are designed into these tasks\(^3\), accompanied by just-in-time (JIT) information and part-task practice to develop their interdisciplinary (team)skills. Deconstructing a ‘big idea’

\(^3\)From the 4C/ID model by Merrienboer e.a.(2002)
into a more concrete challenge⁴ and building an instructional model around it, is a joint effort of the lecturer(s) and the company’s professionals involved.

![Diagram](image)

**Figure 2: The Challenge supports both interdisciplinary skills training and working on complex professional tasks**

The pedagogy of student innovation labs is assignment-centered. While student teams work on the complex task, or challenge, lecturers, the company’s professionals and researchers take on different roles in the learning process⁵, for both the project and the supporting instruction and JIT information. They are either client, mentor, instructor or expert and have to work as a team as well to (although much more loosely than the students).

Dealing with the complexity of interdisciplinary work, learning how to apply design principles and working out realistic and viable solutions, students are aided by lecturers from the university, who act as mentors to the teams. While working out their solution, students can rely on researchers to understand new technologies and new insights to apply in their work. But most importantly, students have senior professionals from within the company for inspiration, to help them understand the client’s needs, or to brainstorm on possible solutions. And they have an inspiring environment in which to work with them.

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⁴ From Challenge Based Learning by New Media Consortium / Apple Inc. (2009)(2010)
⁵ From the Learning Tracks Model (leerlijnenmodel) from De Bie e.a. (2001)
The business case

Learning students to become innovators not only poses several pedagogical challenges. There is a business case to be made as well. In student innovation labs, professionals, lecturers and researchers all play a part in guiding students in their learning. So for these labs to become a sustainable part of both the company and the university’s programme, this investment should be addressed.

Student innovation labs have some specific educational and economic advantages to them that help make the investment worthwhile. First, from the company’s perspective, student do not only learn the tricks of the trade, but, if instructed well, can actually contribute to the company’s R&D activities, especially in SME’s. And adding to this is the direct access to the university’s research.

And from the university’s perspective, these labs offer a good way to enhance the learning experience for students, offering possibilities for students to be inspired and to excel. Lecturers visit the labs as would they visit interns, with the benefit of visiting several students at a time and thus improving their relationship with the company. And researchers have good access to their field of practice for applied research, playing a part in the company’s innovative projects.

So bringing together the intensive coaching and lab facilitation with the specific benefits of this type of student work and learning, the elements of this business case would be:

- Intensive coaching, both by university staff and by the company’s staff
- Lab facilities within the company
- Instruction outside the university (more difficult to organize)
+ Instruction outside the university (more inspiring)
+ Real-life learning
+ Embedded research
+ Students work on company’s client projects
+ Students contribute to company’s R&D

The business model will vary for different companies and different programmes, but a sustainable and viable case for student innovation labs can undoubtedly be made.
The case for innovation

Apart from the business model needed to allow sustainable labs to be created, there is the case for innovation itself. At the root of every innovation programme, whether in Turku or in Stanford, there is the underlying (economic and social) need for innovators. Globalisation, technological advances, demographic changes, Grand Challenges and emerging markets all require professionals who can adapt to ever-changing circumstances and see across the boundaries of their own discipline.

So, apart from giving students a new learning experience and an additional skill set, student innovation labs can create a new economic value for companies by helping them further anticipate change. And at the same time, universities of applied sciences can play a new role in the professional field by empowering affiliated companies and boosting innovation.

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October 2013
References

Innovation Pedagogy:


d.school model (Stanford - Hasso Plattner Institute of Design):


4C/ID model:


Challenge Based Learning:


and


Learning Tracks Model (leerlijnenmodel):