Powerful Learning Environments

A Guide to Designing Innovation Labs

INSPIRATIONAL COLLECTION

Hogeschool Rotterdam Uitgeverij

ROTTERDAM UNIVERSITY

UNIVERSITY OF APPLIED SCIENCES

Colophon

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Preface

Honors education at Rotterdam University of Applied Sciences (RUAS) aims to help students attain professional excellence. To achieve this, we have identified a set of competences, a 'competence profile' that we have named 'Learning to Innovate'. Our competence profile is structured around five interacting competences, i.e. the ability to focus on (1) innovation (innovation-driven), (2) ones professional environment (demand-driven), (3) collaborative working, (4) lifelong learning (learn interactively), and (5) knowledge creation. The twenty-first-century skills so widely discussed in recent years are also reflected in this profile.[1] We challenge students to master these competences by designing educational activities that give them the space to do so. At the same time, we also give students the space to take charge of their own learning process.

To create this space, the RUAS Honors Program Team has spent several years experimenting with Innovation Labs (referred to below as 'I-Labs'). I-Labs are elective courses (30 credits) in which students devote approximately four days a week for a 20-week period working with external partners in the field on open issues that the latter have raised, as well as with teachers and students at other institutes/programs. The I-Lab design is based on five characteristics, namely that students work on (1) a multidisciplinary issue in (2) an authentic learning environment focusing on (3) professional excellence in which teachers (4) set high standards for their students and in which students work in (5) a Community of Learners (Lappia, Weerheijm, Pilot, & Eijl, 2014, 22-23).

Experience so far shows that the I-Lab's conceptual and procedural underpinnings do indeed produce powerful learning environments in which *all* participants learn. Students say that they feel motivated, challenged, and taken seriously. External partners are pleasantly surprised by the solutions and/or approaches that students come up with. Teachers see the experimental scope of an I-Lab as enriching; they themselves learn more about the subject matter and notice an increase in their expertise in coaching and in challenging students to develop their own initiatives. Researchers are eager to work in this setting because it is one that engages students or appeals to their intrinsic motivation.

1 'There are various conceptual models of twenty-first-century skills, each one emphasizing some aspects more than others, but they consistently include certain specific skills, for example problem-solving ability, critical thinking, cooperation, creativity and self-regulation.'
Translation of excerpt from: De toekomst begint vandaag, Expertisecentrum Beroepsonderwijs, February 2016

Given all this experience, we believe it is important to identify in writing the operative principles that produce such powerful learning environments. We do this in the form of a guide that's purpose is to give teachers and educational designers a series of conceptual steps for designing I-Labs. These steps can naturally also be used to design other powerful learning environments, for example Try Labs, Why Labs and so on.

Developing a learning environment in the form of an I-Lab is a complex task and makes heavy demands on those responsible for preparing and implementing it. It has been said that an I-Lab is 'under-structured but over-prepared.' The design process requires considerable effort at the front end, before actual implementation begins. Thorough preparation – being 'over-prepared' – allows an 'under-structured' experimental space to emerge during implementation, when the students take over.

Reader's guide:
Section 1 of this document begins by explaining the essence of an I-Lab. What makes it so powerful? Readers will come across the term 'powerful learning environment' and acquaint themselves with the five characteristics that must be present for such an environment to emerge. We explore the five characteristics in greater detail and reveal how they are interrelated. We also investigate various elements of these characteristics, such as the issue to be examined, the learning process and professional excellence. What do we mean when we use these terms?

Section 2 presents additional considerations that we hope will also prove clarifying to readers. These are recurring concepts that can be interpreted in differing ways, depending on the viewer's perspective.

Section 3 describes various different approaches to designing a powerful learning environment like the I-Lab. Those involved in the design process experience it as an iterative, exploratory, and instructive process of development.

Section 4 gives an example of what are working elements in a minor+/I Lab.

Where clarification is appropriate, we refer readers to relevant sources that delve more deeply into certain concepts and topics.

We hope our guide proves enjoyable and inspiring.

Honors Program Team Rotterdam University of Applied Sciences

Ineke Miltenburg
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Rotterdam, October 2017/ March 2019

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Essential components for designing an I-Lab

In 2010 we started experimenting with Innovation Labs in our honors program. We have found that the best way to describe an I-Lab is as a 'powerful learning environment' whose design is based on the following five characteristics (Lappia-van Es, 2015, 226; Lappia et al., 2014, 22-23):

1. a *multidisciplinary issue drawn from actual practice*
2. an *authentic learning environment*
3. *professional excellence* as both the aim and basis for assessment
4. qualified teachers *setting high standards* for their students
5. working and learning in a *Community of Learners* made up of all those involved.

These five characteristics will only lead to a powerful learning environment if they are *all* present *and* if they are *interrelated*. No one feature can exist without the other.

We start our description of each feature with a quote. We then explain the basic concepts and what we mean by them.

Re 1: A multidisciplinary issue drawn from actual practice

> *'An intractable multidisciplinary issue has been described that students in different disciplines can work on, where relevant in small groups – and, where relevant, with each group consisting of students at different levels of competence. The issue calls for innovation – in other words, it cannot be resolved taking a routine approach – and requires new knowledge and higher-order learning, which in turn means taking a knowledge-driven approach to solving a problem drawn from actual practice (related to knowledge creation).'*

What do we mean by 'intractable' and 'multidisciplinary' and why do these concepts represent the essence and therefore the starting point of I-Lab design?

The issue presented to the students must be intractable. What we mean is that it must be raw, open, complex, perhaps even hairy or slippery, making a routine approach unsuitable. By raw, open and complex, we mean that none of the aspects of the issue can be isolated to make it easier for students to 'digest.' In other words, the issue cannot be turned into a theoretical or academic problem that allows students to practice applying a theory.

The issue presented to students should encourage multidisciplinary cooperation. What we mean is that the issue should be of *genuine relevance* in the world outside the I-Lab; stakeholders in the profession and in society are looking for answers too. They need – and they have a vested interest in – new insights and new or innovative strategies.

The issue should therefore be presented in the same way that it has arisen in the profession and in society: as a complex, complicated matter, with no solutions within easy reach, seemingly unsolvable.

This approach produces an issue that requires contributions from different disciplines. It is impossible to come up with satisfactory answers without exploring the issue from differing perspectives or without applying analysis and operational models drawn from different disciplines, whether academic or professional. It takes a multidisciplinary effort and innovative approaches to find solutions.[2]

Because the issue requires a multidisciplinary, innovative approach, it logically also involves cooperation between teachers, internal and external experts, and students majoring in different subject areas or enrolled in different study programs. Their cooperation is not about the act of cooperating itself. To explore every facet of the issue and come up with solutions or start identifying solutions, students, professionals in the field, and teachers need expertise, analysis models, operational models, skills and forms of cooperation utilized in various different subject areas and the profession.

2 We use the term 'multidisciplinary' because it is described as such in our Learning to Innovate competence profile. There is currently a growing tendency to differentiate between interdisciplinary, multidisciplinary and transdisciplinary (between two disciplines, between multiple disciplines, and across multiple disciplines). We will continue using the term 'multidisciplinary' here and, where necessary, apply the most challenging interpretation.

Exploring and coordinating the different forms of knowledge present in those disciplines, in the profession and in research can help in the quest for answers. To arrive at innovative solutions, answers must be assessed and coordinated. Different methods can be used to do this, for example 'idea-generating sessions' or 'scrum meetings.'

Idea-generating sessions consist of the following process: diverge, converge and interim consolidation – 'Where do we stand?' – and proceed. This process teaches the participants to learn about and utilize one another's expertise. In a scrum meeting, the back-and-forth process always takes place within the group. The idea-generating process is also suitable for individual students working on their own.

These processes offer a relatively systematic manner of bringing all the different facets to the fore. The point is to scan, explore, search for and discover new options.

Re 2: An authentic learning environment

> *'Teachers have worked with partners in the profession and researchers at a knowledge center to create a challenging learning environment for honors students. This environment calls for "situated learning," in other words learning in a context that resembles the situation in which the students will have to "learn to innovate" – it is related to the ability to function in a demand-driven system (Herrington & Oliver, 2000). An authentic learning environment requires both teachers and the honors program to be externally oriented, in other words to focus on issues and options drawn from professional practice.'*

What do we mean by 'authentic' and why is this a feature?

The word 'authentic' fleshes out the relationship with (1) 'an issue that must be of *genuine relevance* in the world outside the I-Lab.' By presenting students with a genuine issue, I-Lab invites cooperation as it will take place later in the world outside, as they work on a problem in a team with their colleagues and experts from multiple disciplines. Because the outside world genuinely needs answers, students will also feel challenged by and held directly accountable for the situation that they will encounter at a later stage. This helps students form a clearer idea of their future profession.

We believe that an authentic, challenging learning environment develops by creating the most 'genuine' circumstances possible, circumstances that will also arise later, when students are working in their profession. By most 'genuine,' we mean circumstances where the following applies:

- *urgency:* stakeholders are 'waiting for answers'; it truly matters that students are searching for and finding solutions or attempting to do so because the profession has no answers yet;
- *commitment:* those who have presented these complex issues are actively committed to the learning process;
- *CoP/CoL:* students, teachers, knowledge centers and stakeholders from the profession and society build an alliance because they are actually all learning; working together gives rise to a Community of Practice (CoP), also known as a Community of Learners (CoL);
- *shared ownership:* the totality of elements listed above gives all the participants a sense of ownership; everyone feels responsible for the outcomes and for working on those outcomes as a team.

An authentic, challenging learning environment requires teachers to adopt a different role and to use different interventions than a teacher in a 'traditional' classroom setting. We take inspiration from the Triple Helix Learning Environment model because our experiments have shown how well it can work in an I-Lab setting (Blom, 2012).

The Triple Helix Learning Environment model looks like a triangle with four participants: client/profession, researcher/knowledge center, teacher, and student. The student occupies the center of the triangle. The three corners of the triangle are occupied by the client working in the profession, the researcher affiliated with a knowledge center, and the teacher. By positioning the participants this way, it becomes clear that each one operates from a different vantage point. Working from these distinct vantage points, each participant bears a different responsibility, and therefore (should) undertake different interventions:

- The client ('company') is responsible for the value of the product or rather the professional relevance of the *outcomes*; the client assesses content and utility and whether the outcomes will drive progress in the field. This does not mean that the client/profession awards a mark or score for the outcomes.
- The researcher is responsible for the quality, reliability and relevance of the *research process* that students engage in.
- The teacher is responsible for supervising the learning process, or rather for seeing that the student develops the necessary competences, and for assessing that development.

Together, with each one operating from his or her own vantage point, the three partners bear **complementary** responsibility for the quality of the student's learning and of the final product, also referred to as the 'professional product.' The interventions are also complementary, with each partner contributing his or her own expertise. Distinguishing between interventions in this manner gives students space to manage their own learning process. That is their challenge.

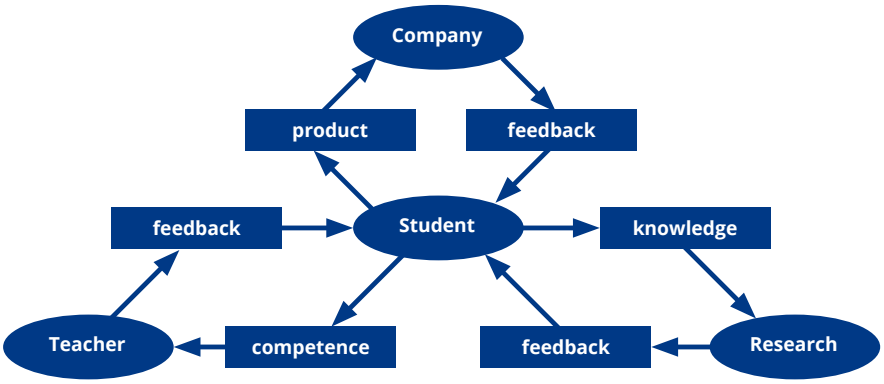

Figure 1

We will return to the teacher's role when we discuss feature four, 'Teachers set high standards for their students,' and in Section 2.

Re 3: Professional excellence

> *'Our aim and the basis for our assessment is for students to learn to innovate by working to develop innovative solutions to problems drawn from actual practice. As a general Honors Program attainment aim, professional excellence is elaborated in the Learning to Innovate competence profile. The profile consists of five distinct but indivisible competences: being innovation-driven, being demand-driven, being cooperation-driven, being able to engage in interactive learning, and being able to generate new knowledge.'*

The relationship between a powerful learning environment and the eliciting of professional excellence.

The question that naturally arises when working on multidisciplinary issues drawn from current practice and when creating an authentic learning environment is: Where is this taking the students? What are we actually trying to achieve? This question brings us to the third feature, i.e. the quest to achieve professional excellence (Eijl, 2013).

As noted earlier, the RUAS Honors Program uses the five competences of the *Learning to Innovate* competence profile to focus the development of professional excellence. By working in an I-Lab setting, students get to work mastering the five interrelated competences of the profile and in doing so initiate and maintain their professional development. It is possible for them to do this because the five competences are reinterpreted in terms of 'role,' 'domain,' 'specification,' and then in sentences that have the following structure: 'at …, the aim is to … so that …'

Because students initiate learning by tackling a complex multidisciplinary issue, everything revolves explicitly around their learning process and their development. Students will 'automatically' come up with such questions as:

- What will I do or what should I do?
- What will I/we investigate? What knowledge and skills do I need/are needed in this context?
- What will I learn by helping to solve this problem?
- What can I learn with and from others if I want to arrive at reliable results within a given timeframe?
- What am I learning from this about delivering reliable results, about the learning and working process that I am undertaking on my own and with others? What am I learning about my own actions? In other words, students will address the following questions: Am I doing things the right way, am I doing the right things, and am I doing things for the right reasons?

Or, as students themselves have said: 'Working in this setting has helped me discover what I'm interested in'; 'I've learned a lot by cooperating with students from other study programs'; 'I've gotten to know myself better'; 'I have a much better idea of how I see the future'; 'I now know how I can apply the knowledge and experience that I've gained.'

RUAS now offers study and career coaching to help students develop a professional identity. Because such coaching focuses on students' personal and professional development, it is also suitable in an I-Lab setting. Asking students how they relate to their future profession and to their environment kindles awareness. Once their awareness has been raised, students can make sense of what is being asked of them by putting it in their own words. Students can frame their own experiences and then manage their own learning and learning process; they assume control of their learning process.

This is what Biesta is referring to when he uses the terms 'qualification,' 'socialization' and 'subjectification' (Biesta, 2015).

Re 4: Teachers set high standards for students

> *'The learning environment described above and the issues drawn from actual practice are highly suitable for students who have the desire and ability to develop beyond what a regular Bachelor's program offers them. Honors students want challenges in the form of complex tasks and high standards, along with more autonomy and space for their own initiatives. Students and teachers have a "growth" mindset (instead of fixed mindset) (Dweck, 2010), with teachers viewing a practice-based honors program as a means to encourage students to develop above-average ability, creativity and task commitment. Motivation is the main recruitment and selection criterion for honors students. Teachers seek teaching strategies that will induce problem ownership and commitment among honors students.'*

What do we mean by setting high standards and why are they necessary for development?

It is not possible for students to work on multidisciplinary issues in an authentic learning environment with the aim of attaining professional excellence unless teachers set high standards for them. As we all know, telling someone often enough that they are incompetent and not encouraging them to work on mastering a skill will undermine their confidence in themselves.

Setting high standards and exuding confidence in students' ability to meet those standards are therefore essential components of a powerful learning environment. They cannot be viewed separately from creating *challenging* learning environments in which students are *truly able to show* that they deserve the confidence placed in them. That is how students can gain 'self-efficacy.' Setting high standards also cannot be viewed separately from encouraging students to take charge of their own learning process.

The essence of all this lies in combining the two vantage points mentioned: 'You are willing and able, or you'll want to be able.'

The *first* criterion for inducing this process is for teachers to deploy reflection in their coaching. The *second* criterion is to turn compiling a portfolio into a meaningful *development* exercise. The *third* criterion is for teachers to be aware of their role in the Triple Helix Learning Environment – and to act accordingly.

Teachers who design and work in powerful learning environments must have or develop the 'open mindset' described by Dweck (2010). An open mindset starts by identifying and learning to recognize one's own prejudices. This makes it possible to discern differences between students and to learn how to deal with them. Important questions in that context are 'What should I, as the teacher, do to learn this student how to take charge of his or her own learning?' 'What pedagogical skills must I, as a teacher, master so that I can apply them flexibly to support students' learning processes and development?' What is remarkable is that an open mindset leads, almost automatically, to inclusive education.

Students who choose to enroll in Honors Programs tend to have the following personality traits (albeit in latent form): above average ability, creativity, and task commitment. By enrolling in an Honors Program, students call on these traits and make them manifest. As Renzulli (Renzulli, 2012) and Scager (Scager et al., 2011) have shown, one factor is that these three traits need to be present in relatively equal measure. It is up to teachers to have the knowledge and skill to recognize these traits in students. What challenges will a student then face and what type of supervision or coaching will he or she need to meet those challenges?

Re 5: Learning in a Community of Learners

> *'Because the supervision method places considerable emphasis on student autonomy and self-guided learning, it is very important for students and teachers to build a relationship (of trust) and become a close-knit community; this proposition is supported by the theory of the authentic learning environment and situated learning (Herrington & Oliver, 2000) and by Deci and Ryan's Self Determination Theory (SDT) (2002). Communities of Learners are an important part of an authentic learning environment and act as a gateway to the various "Communities of Practice" (Wenger, 2009; Lave, 1991) that students will enter after graduation as subject specialists and as resilient and innovative professionals.'*

What do we mean by Communities of Learners and what are their crucial elements?

The fifth feature, an I-Lab Community of Learners, brings us full circle: if learning commences when students tackle an intractable issue drawn from current practice in an authentic learning environment with the aim of developing professional

excellence and in which they must meet high standards, then a 'temporary' community will arise in which students, teachers, researchers and professionals learn and work together. We refer here to the term 'experiential learning' and the associated learning cycle (Hargreaves & Fullan, 2012; Kreber, 2001).

All those involved band together in a Community of Learners (CoL), sometimes known as a Community of Practice (CoP). Elements crucial to creating a CoL that functions as it should (Andringa, 2014. Lave, 1991, Wenger, 2009) are the following:

- a common cause = *an urgency felt by all,* a problem drawn from current practice that all view as intractable, and the need and desire to solve it;
- the realization that no *routine* answers are possible; the problem genuinely requires innovation, not improvement;
- the *participants* themselves help determine the way forward.

Before a CoL commences, the participants should consider the following steps:

- Make clear what the community is about, that you will be embarking on a journey together, that the itinerary is not fixed and neither is the destination, that you will be involved in a process of seeking and learning that can easily go off in any direction if there are no guideposts, and that guideposts can serve to mark out the domain. Issues are worth the effort if they have the potential to spur people into action;
- The more urgent the issue, the better;
- When assembling a group of students, teachers, researchers/research coordinators and professionals, make sure that the various participants possess or can call on the expert input needed to find answers;
- Consider knock-on effects, in other words: one group finishes but the problem cannot yet be solved, so the next group continues working on it;
- Support development, be aware of the distinction between overseeing the subject matter and overseeing the working and learning process; carve out space to let go of patterns of thinking, to generate trust, to ask questions;
- The group is responsible; the focus is on the group's target and, following on from this, on the individual and group learning processes;
- Reflect: Are we still doing the right things? Are we still working to achieve our target? Take time to create a learning history document;
- Do new things; a CoL focuses on learning to innovate. Learning and innovation are cyclical processes that occur simultaneously in individuals, in groups, and within and between organizations;
- Make the time and effort to list the results and publicize them.

Considerations and additional information

Readers will have noticed various recurring concepts in this text. In this section, we attempt to explain some of these concepts or topics in more detail. The considerations and additional information are meant to help teachers design powerful learning environments.

Our experience has shown us that combining the five characteristics with the Learning to Innovate competence profile can indeed produce powerful learning environments.

Thoughts on 'innovating'

The word 'innovating' evokes many different images. What do we actually want from students when we ask them to innovate? Are we expecting them to come up with an entirely new answer that no one has thought of before? Do we want new forms of knowledge? Are we asking for a new approach, in other words a new working process leading to innovation? Do we want their personal and/or professional development? Or are we asking for all of these combined? We believe it is the latter, and research and the literature appear to support our view.

For her PhD, Suzanne Verdonschot (2009) studied what produces breakthroughs in innovation practices. She approached the subject from the perspective of the 'profession,' not that of education. In her study, she identifies eleven 'design principles' on which innovation is conditional:

- Formulate an urgent and intriguing question
- Create a new approach
- Work from individual motivation
- Make unusual combinations of subject matter expertise
- Work from mutual attractiveness
- Build on strength
- Create something together
- Entice [students] to see new signals and to give them new meaning
- Connect the world inside the innovation practice to the world outside
- Pay attention to the social and communicative process
- Actively support the development of competences

What is noticeable about these design principles is that, when we approach innovation from the perspective of 'the profession,' then the issue itself turns out to be essential; it provides inspiration, it motivates, it acts as a driver.

Besides connecting the world inside and the world outside innovation practice, another striking design principle is to make use of unusual combinations of subject matter expertise.

The foregoing principles reappear in some of the five characteristics for designing powerful learning environments, although different wording is used: formulate an urgent and intriguing question; make use of (provide) unusual combinations of subject matter expertise; connect the world inside...with the world outside.

The foregoing in fact also applies to George Couros' 'Innovator's Mindset' (2014), which we elaborate on below. Couros identifies eight characteristics of the Innovator's Mindset:

- Empathetic — putting ourselves in another's shoes
- Problem Finder — asking good questions instead of simply asking for answers
- Risk Taker — going off the beaten path – trial and error
- Networked — being connected – sharing ideas leads to better solutions
- Observant — looking around – recognizing and creating connections;
- Creator — turning ideas into action
- Resilient — persevering when things don't work on the first try
- Reflective — looking back and looking ahead

Interestingly, these eight characteristics run parallel with concepts used in RUAS's description of the 'Learning to Innovate' competence profile.

Figure 2

Peter Oeij (2017) received his doctorate for his research on 'Resilient Innovation Teams.' The main question that he addresses is: What typifies project teams that exhibit innovative behavior? In his study, he focuses on team behavior. What repertoire of actions is needed during critical incidents, in other words when a routine approach is not enough? How can teams improve the success of their innovations?

Oeij too arrives at a number of traits that he refers to as 'innovation resilience behavior':

a. to be alert of 'weak signals'
b. to resist oversimplification by suggesting valid alternatives
c. to remain sensitive to what is done in the projects, why and for whom
d. to be able to change course when needed
e. to defer to expertise
f. to monitor vigilantly what the team does[3]
g. to brief and debrief decision making during the project
h. to reflect and organize feedback loops in order to learn from what the team does

These traits are backed up by organizational conditions for innovation resilience behavior: team psychological safety, to allow team members to make mistakes; team learning, i.e. a team climate that encourages experimentation; team voice, i.e. all team members have a say in decision-making; and complexity leadership, i.e. leaders who can reconcile possibly opposing views.

Finally, Oeij developed various instruments to analyze 'innovative behavior' and track down obstacles.

Here too, we recognize a number of concepts that also play an important role in learning to innovate: '...consider valid alternatives; allow mistakes; leave room for experimentation; defer to expertise.'

Thoughts on reflection and the role of the portfolio

Reflection is not always very popular in higher professional education. Too often, students are asked to reflect during the course of a year without having gained enough practical and learning experience to reflect on. If reflection is then not followed up by meaningful and instructive discussion, students are likely to resist. In short, you could say that we are ourselves to blame for such fierce student resistance.

3 items f, g and h were not systematically included in Oeij 's measuring instruments.

And yet, we *know* that reflecting on experiences, and especially on experiences in profession-critical situations, can help students engage in explicit learning and encourage them to manage their own learning process. By engaging a student in a dialogue about his or her profession-critical experiences, we can trace learning moments that may have initially escaped the student's notice. Asking questions – sometimes specific questions – plays an important role in this.

By reflecting, *both one-on-one and in a group*, students learn to ask themselves such questions as:

- Have I/have we done the *right things*?
- Have I/have we done things the *right way*?
- Have I/have we done things for the *right reasons*, considered the right factors with regard to ethical aspects, accountability to society, financial prerequisites, …?

Reflection should include these three aspects.

We can take reflection full circle by asking students what reviewing the foregoing three aspects has taught them about their own development and how much progress they think they have made:

- What have you learned about yourself?
- What have you discovered about your strengths and weaknesses?
- What have you learned about your efforts?
- What have you learned about your role in the team, your contribution to the process itself, and about developing your expertise?
- What will you do with that information?

Taking reflection full circle makes it meaningful and effective for students.

Reflecting on practical and learning experiences helps students develop their own ideas about what their future profession will require of them. Nowadays, we refer to this as 'professional identity' (HR 2016). By encouraging professional identity in students, we are addressing such questions as 'Who are they as people?' 'What do they want to learn?' and 'How do they wish to relate to their profession and environment?' Students need to engage in the process of reflection so as to make conscious choices in learning, to take charge of their own learning process, and to make the transition from 'study coaching' to 'career coaching.'
Keeping a logbook and compiling a portfolio are activities that support reflection and the students' transition to career coaching. They help students become aware of what they are working towards and what they must learn and master to get there, and support them in developing their own initiatives. In this context, the portfolio becomes a development instrument in which students collect experiences, reflect systematically (for example using the STARR model) and are given feedback in dialogue with fellow students, supervising teachers and external parties.

Students will only be prepared to pour energy into assembling a portfolio if that dialogue turns out to be useful for their own development. The best and most effective form of 'development portfolio' will need to be identified for each 'professional practice.' In the Honors Program, the portfolio can easily be used at the end of the course for purposes of final assessment.

Thoughts about the need for teacher expertise in an I-Lab setting

'The teacher makes the difference.' We can tinker around with all sorts of factors, but research has once again shown that the teacher's pedagogical expertise is and remains the decisive factor in student learning.

Designing an I-Lab requires teachers to have expertise in relation to at least three features:

- determining the suitability of issues;
- supervising and intervening in group processes and maintaining high standards;
- supervising, coaching and assessing student competence development.

Teachers need not all be experts in 'everything.' Those assembling teaching teams can also ensure that the team as a whole possesses different forms of expertise. That way teachers can complement and even learn from one another.

Suitability of issues

Teachers must be capable of determining the suitability of a particular issue, in any case with respect to the characteristics 'multidisciplinary,' 'professional excellence' and 'Community of Learners.'

For teachers to determine an issue's suitability requires them to discuss the role that the external partner or client plays in an I-Lab. The involvement of external partners plays an important role in the exploration of an issue and the space that students need to do so. Experience shows that external partners and experts are prepared to play a role in I-Lab settings.

Supervising and intervening in group processes and maintaining high standards. Supervising, coaching and assessing individual student competence development.

Teachers must also be capable of designing and supervising learning/working processes, for example 'idea-generating sessions' – processes in which students master the art of diverging and converging. Becoming skilled at this type of method encourages students to be active, to explore, to feel confident, to take risks and to take responsibility.

Teachers need to be or become skilled at knowing 'when and when not to intervene in group incidents,' 'when and when not to intervene in a group process,' 'when and when not to step back,' 'when to take the time to analyze a group process with students from different vantage points.'

When teachers intervene, they should always ask themselves 'What is this teaching us about our approach, our team, and ourselves? What do we need to go forward, in terms of subject matter, processes and as individuals?' By engaging in this manner, teachers build their own expertise.

When it comes to encouraging student competence development, the skills toolbox should also include supervisory skills. What sorts of questions and which interventions encourage students to learn? How do you have a dialogue about entries in a portfolio? How do you foster 'explicit' learning in students? The teacher's role as 'competence supervisor' requires these skills. Another necessary skill is the ability to give feedback at differing levels of reflection (Korthagen & Vasalos, 2005).

In terms of subject matter, teachers should exercise restraint in two different ways. On the one hand, no one can be an expert at everything; on the other, students need to take the initiative in calling on teachers' and external partners' expertise. What is important, however, is for teachers to recognize when students get stuck and to intervene when they suspect that students are 'oversimplifying.' The SOLO taxonomy[4] may be useful in this regard; it focuses on the concept of 'complexity' and offers a convenient way of thinking about it.

Thoughts on 'testing'

Students generally participate in I-Labs in their seventh semester, i.e. the first six months of their fourth year of study. In theory, they can enroll in an I-Lab at an earlier point in their study program – when these are referred to as 'Try-Labs' – and in any year. The question is how to proceed with testing in a way that assesses individual student achievement.

In higher professional education, students work on a graduation project in which they are required to address the aspects 'context,' 'task,' 'independence' and 'innovation.' The level of complexity of these four aspects and the extent to which students show themselves capable of developing, taking and maintaining control over them gives us a yardstick for determining and assessing the 'quality' of this final project. In terms of 'innovation,' RUAS assesses the 'professional product' that the student produces as either an 'improvement,' a 'change,' a 'renewal' or a

4 see *http://www.nwlink.com/~donclark/hrd/Bloom/SOLO_taxonomy.html* (03.10.2017)

'discovery.' To obtain a Bachelor's degree, students must deliver a product that is at least an 'improvement.' In the Honors Program, they must, at the very least, produce a 'renewal' and preferably a 'discovery.'

We test and assess students using the Learning to Innovate competence profile. We also make use of the Higher Professional Education Graduation protocol and apply various taxonomies to ensure that our testing is satisfactory, valid and reliable. What we aim to assess is how students work in teams on complex issues (drawn from practice). That means that we are obliged to assess four aspects:

- the quality of the *outcomes* of the student's work; once again, we refer here to the Triple Helix Environment Model: external partners and researchers play a key role in this
- the student's contribution to the working process and group process; supervising teachers and fellow students play a role in this
- the student's *individual contribution* to the outcomes; supervising teachers and fellow students play a role in this
- the student's *individual development*: is the student demonstrating an ability to reflect on his/her own actions
    - in relation to the subject matter?
    - in relation to the working and group process?
    - in terms of his/her own and others' actions in that process?
    - in relation to his/her own growth and ambitions?

We base our assessment on the behavioral elements of the Learning to Innovate competence profile (HR 2016-11).

As we noted earlier, we use the Learning to Innovate competence profile as a basis for designing honors education. The five competences featured in the profile have been broken down into behavioral elements. These elements offer guidelines for giving students effective feedback and feedforward. On that basis, students can then set learning and development goals for themselves. We also use level indicators that show, for each competence, the impact that the student's behavior has had on every aspect of the learning process.

This assessment method can be keyed to the student's current year of study. Step by step, and specifically by means of planned dialogues, students can be guided to 'taking charge' of their own learning process. Be aware, however, that each student progresses at his or her own pace.

Where necessary, feedback can be converted into a grade or assessment.

Approaches to designing powerful learning environments

We can commence the design process leading to a powerful learning environment such as the I-Lab from a variety of different starting points. We have identified three:

- Start the design process by addressing a *topical issue* that has been presented by one or more external partners.
- Start the design process by addressing *an issue that you, the designers, have identified.* It should be a topical issue in society and/or business but does not come directly from an external partner.
- Combine the above two.

The next step is to list the concerns that play an important role in the design process. These concerns should reflect the five characteristics.

Designing based on an issue presented by external partners (be over-prepared):

- Explore this issue by immersing yourself in it and by assessing the potential that it offers your students for learning: does it evoke a multidisciplinary setting, is it challenging, complex, intractable? Consider which study programs could play a role.
- Discuss the present state of the issue with your external partner or partners – what are the precise questions that need addressing, what innovations are currently under way in this area, what experiments are already taking place, what opportunities are there – so that you are fully prepared as a teacher and can ask your students challenging questions that will get them and keep them working.
- Discuss your external partner's/partners' expectations with regard to his/her/their role or tasks, as well as their expectations of the other I-Lab participants.
- Prepare the authentic learning environment by searching more widely for experts, for example among research coordinators and expertise centers. It is not your job to ensure that the external partners will in fact participate; that is the job of the participating students. However, it does help teachers to know what types of experts will need to be consulted.

- Prepare yourself as a teacher by considering what 'professional excellence' means in this setting. Consider which versions of professional excellence might emerge. This step is not meant to be exhaustive but to expand the way you think about opportunities and potential: What can you expect and how will you deal with it? At the same time, you should recognize how this corresponds to setting high standards and the necessary development of/ evolution towards an 'open mindset.'
- Imagine all the many things that could happen working in a CoL. Doing so will allow you to explore in advance which interventions might be necessary and to deliberately address the question of when and when not to intervene, so that you can concentrate on getting the students to take charge.
- Prepare tests that allow for potential differences that may arise between students. Make sure that those differences are acknowledged and discussed and see that testing and assessment take account of these differences.

Designing based on an issue that you, the designers, have identified
There are topical issues in society and/or business that have yet to be addressed. They must be tackled because they are expected to require new answers and new solutions; examples include issues related to energy, the environment, social inclusion or the growing level of income inequality.

Producing a design based on an open issue of this kind requires you to start off differently:
- Begin by exploring the issue from every angle as designers so that you know what it entails and which external parties and experts in society and/ or the business sector will be affected by it. For whom is this an urgent issue?
- If your exploration reveals that it is indeed a multidisciplinary, complex and intractable issue that external partners can commit to, then follow the design process described above.

Designing based on a combination of the two
It is also possible that an external partner will come to you with a question that is very open-ended. For example, in one partnership, a hospital has presented us with the same question for several years in succession: 'We're an innovative hospital. What can or must we do to remain innovative?'

We submitted this question to our students and challenged them to come up with ideas and designs and to find external partners themselves. In this case, teachers should focus on coaching students and encouraging them to seek out ‘just-in-time’ knowledge.

Whichever perspective applies, the fact is that the preparation process is crucial to powerful and effective implementation!

The circle of talent development

In the book 'The Honours Experience' (Eijl & Pilot, 2016), the process of talent development in an honours programme is central. This process has several steps, from the start to the completion of the honours programme and beyond. Not every student goes through these steps in the same order, but they are often revealed in the interviews. For clarity, we have therefore arranged the steps in the "circle of talent development" (see Figure), which was partly inspired by "The hero's journey", a book by Joseph Campbell (1949).

We first describe the steps the circle, illustrated with brief quotes from students interviews.

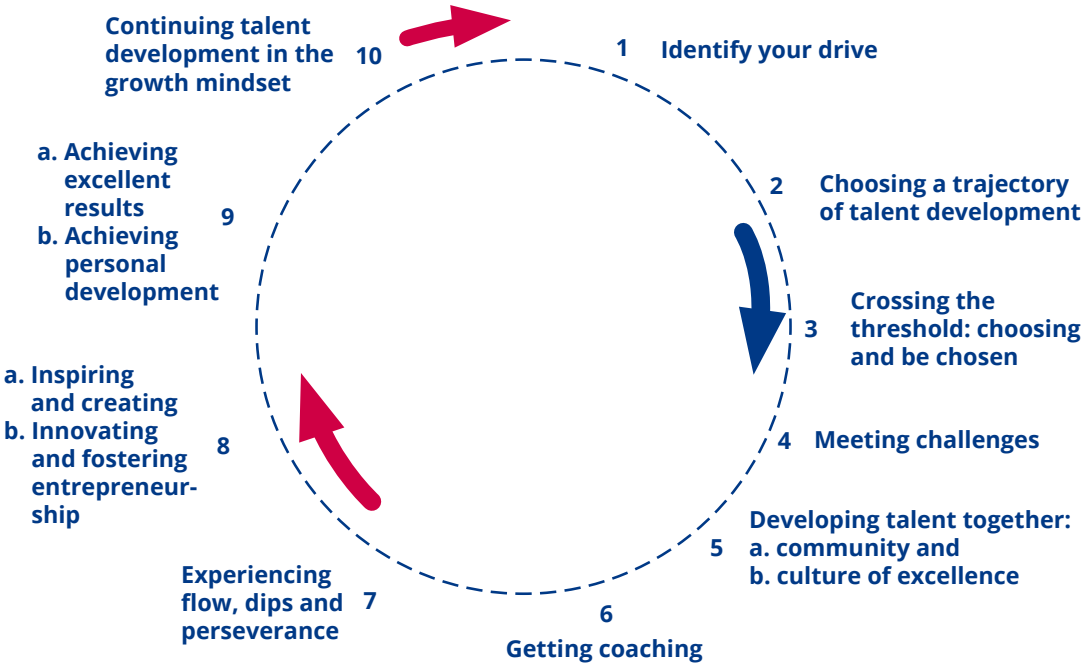

Figure: The ten steps into the circle of talent development

Step 1: Identifying your drive

The start of the process of talent is shown in Step 1: identifying your own passion, your drive; the students identify what they want to do more than their regular curriculum provides. An example: "Looking for a little extra, a chance I could grab to distinguish me from the rest" (Jamila Schalken, honours student HvA). Often it is also about doing the study activities in a different way, which gives the student an extra challenge. For some students, but also for their environment, their talents are not visible yet, which is called "latent talent".

Step 2: Choosing a trajectory of talent development

Students who need more challenge, look for new opportunities. Following an honours programme is in this way an opportunity that comes on the student's path. An example: "Do not stop and go for your dreams, because these efforts will be recognized and so you will always produce something" (Elsemiek Geerdink, honours student Saxion). One way in which a student can get acquainted with a honours programme is to get information from a student who is already an honours student. Some schools ask honours students as ambassadors for the programme, and ask them to provide information to their fellow students. The choice to participate in an honours programme may be for students a part of the development of their personal leadership. This is the ability to make decisions in a good way in their own lives.

Step 3: Crossing the Threshold: choosing and be chosen

The choice to participate in an honours programme must come from both sides: the student must choose, but the teachers of the honours programme must also allow the student to be admitted, students must meet the selection criteria. They often have to write a motivation letter and sometimes there is an admission interview. An example: "Finally, I was invited to an admission interview" (Alexander Oude Elferink, honours student Windesheim). The teachers also consider the study results and consider especially whether the student is really interested in the honours programme, has a proactive attitude and a capacity for growth. The principle of 'giving and taking' is important in honours: both the teacher and the student are expected to contribute actively.

Step 4: Meeting Challenges

Once in the honours programme, the challenge and the actual learning really start. Students get complex, authentic assignments and projects that are often linked to real problems and real clients. An example: "We had a lot of guest lectures, which were not all equally interesting. But then came the team assignment for the police organisation and that was unwise cool "(Iris Jansen, honours student Windesheim). The honours students sometimes work together with students from other disciplines and with teachers or even external clients. This differs from the approach in mainstream education and provides a challenge for the student and the supervisor. The teacher must include dealing with the differences between students and this may pose dilemmas for the teacher as well.

Step 5a, b: Developing talent together in a community and culture of excellence

Students usually study not only individually but together with other motivated students and usually are very positive about this in the honours programme. By working together, they come to the exchange of new ideas. An example: "The way we work and the working atmosphere within the honours programme are a world apart from the regular education" (Guido Diana, honours student Windesheim). The networks of contacts within the programme often grow into an 'honours community'. In the interviews students speak with great appreciation about their community. A characteristic of these communities is the culture of excellence: encouraging each other, working together and achieving a result that matters! An example: "In honours programmes students are more motivated. Those students are highly motivated to invest time and energy. They all want to show a good result "(Iris Jansen, honours student Windesheim).

Step 6: Getting coaching

Coaching can make the difference in talent development. The teacher can help a student to become on track and ensure that his or her talent development is really successful. To achieve this, the coach helps the student from his comfort zone to enter into the 'zone of proximal development' 'and to take new steps. An example: "You were not told what to do, but ideas came from two sides" (Niels van de Kamer, honours student Utrecht University).

Step 7: Experiencing flow, dips and perseverance

An important experience in the talent development process is to get the feeling of a 'flow': everything seems to go without saying, and the student is studying in an optimal state of development. An example: "Almost the entire period honours it felt like a flow! Apart from the beginning, I had it in retrospect some anxiety whether I would be able to handle the additional programme "(Lise Schampaert, honours student HU). But there may also dips occur, which may constitute a serious obstacle. The identification of a dip and overcoming the dips, need resilience and perseverance of the student. “Grit” (Duckworth & Eskreis-Winkler, 2013) a combination of passion and prolonged persistence is considered as important in reaching success.

Step 8a: Inspiring and Creating

Some problems require new solutions, for which creativity is important. The use of one's own creative ideas and moments of inspiration is important to move forward. There is also courage needed! Step 8a focuses on aspects of the creative process, such as problem finding, the design challenge, fostering a creative atmosphere, but also resistance to change, which means that not everyone in advance is positive if new ideas are put forward . An example: "Everyone has ideas, but you should be able to explain exactly what this entails, even people from other disciplines who do not immediately see the benefit of a product" (Sanne Vermeulen, honours student HU).

Step 8b: Innovating and undertaking

Some ideas can be turned into something that has concrete practical value: an innovation. An example: "In the Future Search course I was with a group to develop an app that was related to injury prevention in sports" (Leander Boelee, honours student HU). As an illustration, in Step 8b this honours course about learning innovation is discussed. The aim is to generate new ideas and to convert these into something that is relevant in practice; it requires entrepreneurial behaviour of students.

Step 9a: Achieving excellent results

Efforts can lead to excellent performance. When and in what ways is an achievement excellent? That is discussed in chapter 9a of the book of Eijl & Pilot (2016). An example: "I definitely feel to have delivered an excellent performance. When I look at my thesis, it contains all five honours competencies of Rotterdam University of Applied Science" (Juliette Wever, honours student HR). The contribution of students to organize the programme and products for external clients can be part of the achievements.

Step 9b: Achieving personal development

Equally important is the personal development because it was often mentioned by the interviewed students. An example: "There is a lot of freedom allowing you much more to come to personal development, because there is much room to get to know yourself and figure out how you learn best" (Kim Tulp, honours student Saxion). Many skills students acquire in honours programmes are 21st century skills.

Step 10: Continuing talent development in the growth mindset

If a project or task is completed within an honours programme, then a new project comes in many programmes in which again (parts of) the circle of talent development follows. This relates in particular to step until 9. Talent development does not simply stop after of the honours programme, but grows into a "way of life as the honours alumnus continues to develop himself or herself. An example: "The honours programme has had great influence on my further study and work. I decided, instead of immediately going to work and to start with an house and garden, but first searching for more adventures "(Lise Schampaert, honours student HU). To identify opportunities for growth and to address a growth mindset is important. That is the mindset to tackle new challenges and not to set them aside. Through this approach, a person further develops.

Features of a course of study that facilitates the development of honours competences

Martin Reekers

Introduction

What characterises a course of study that succeeds in facilitating the development of honours competences? This is the central question in this chapter. To answer it, we looked at a specific case – an innovation lab – which apparently succeeds in developing these competences: the innovation lab Silicon Venturing Rotterdam. This course can be taken by students studying for an honours degree at the Rotterdam University of Applied Sciences (RUAS) and is therefore referred to as an "innovation lab" (an innovation lab takes 20 weeks and 4½ days/week of the students' time; 30 credits in the Dutch system). This innovation lab is a joint venture between RUAS and the Albert Schweitzer Hospital in Dordrecht (ASZ). It has proved to be a success over four consecutive years – a success in the eyes of the ASZ, the participating students, the teaching staff and the Business Innovation Knowledge Centre, the department of the university with responsibility for the innovation lab. It is unclear what makes the innovation lab a success. The programme and its implementation are designed quite intuitively and are always geared towards the uniqueness of the cohort of students taking the course – a group that is multidisciplinary in its composition, entirely in line with the intention of this course. However, a constant factor is the success that has characterised every edition of the innovation lab so far.

It therefore seemed appropriate to investigate whether it would be possible to produce a description of the effective elements of the innovation lab, perhaps even in such a way that would allow these elements to be transferred to other courses. It was decided to observe the edition of the course run in the 2017-2018 academic year with the aim of identifying its effective elements and describing them in a way that enables them to be applied in other courses. For this reason, the observations were linked to what is known in the literature about effective education and pedagogical methods within it, in order to make it possible to identify the effective elements of this version of the innovation lab.

This chapter is based on the report that was written following this observation. The full report can be found at: https://www.hogeschoolrotterdam.nl/onderzoek/projecten-en-publicaties/pub/de-minor-silicon-venturing-rotterdam/2e254032-1f46-4b27-986e-767d00cd8275

The question under investigation

In light of the evident success of the innovation lab, the question underpinning this investigation is not whether it is successful but what the factors are that make it successful. Evidence of this success can be seen in:

- the praise expressed in student evaluations;
- the letter from the Executive Board of the ASZ to the Executive Board of RUAS requesting a review of the proposed decision to abolish the innovation lab;
- the ASZ's assessment of the positive outcomes of the innovation lab for the hospital;
- the students' learning outcomes as established on the basis of the products delivered to the hospital, the descriptions by the students in their assessment files, the assessment interviews and their evaluations.

We therefore looked at the effective elements that can be observed based on the available data on the innovation lab and data obtained through observation and interviews.

The question we investigated was:

What are the effective elements that contribute to the success of the innovation lab Silicon Venturing Rotterdam (innovation lab SVR) and how can they be described in a way that makes the approach transferable?

A cautionary note that has to be sounded here is that it is risky to speak of causal relationships between those elements and the success of the course. Where causality can be established at all, this would require a much more intensive study than was carried out this time. The reasoning used in this case is that if the innovation lab is evidently successful, then it would be worthwhile mapping out and describing its "active elements," on the assumption that if they were to be incorporated into other programmes in the future, those programmes would likely achieve similar success.

Effective elements of the innovation lab Silicon Venturing Rotterdam

A total of 14 elements were identified and described in the observation. These are as follows:

a. *The concept and structure of the minor programme*

The minor programme is designed to get the students learning autonomously and independently as soon as possible. At the same time, the students also form part of a cohort from 6-8 different disciplines. There is a recognisable thread in the programme that runs from the provision of the material via problem-based learning to a solution-oriented approach. In the first few weeks of the innovation lab, attention is mainly focused on offering tools and skills. The teachers keep in the background as far as the content is concerned and expect the students to be, or to develop the ability to be, proactive. The teachers have a range of tips and tricks to hand which they use to coach the students in this process.

b. *The role of the partner organisation and hygiene factors*

The partner organisation stipulates the following hygiene factors:

- A contact person from the organisation acting as an intermediary between the organisation and the students and teachers.
- This contact person should be available for an adequate amount of time.
- The innovation lab should be run on the premises of the partner organisation.
- A partner organisation in an industry in flux with the desire to promote out-of-the-box thinking in the organisation.

c. *The informal position of students*

The informal position of the students in the organisation allows them to easily establish informal contacts outside of what can sometimes be complicated organisational procedures. This point seems to be particularly important in organisations with strongly protocol-based business processes.

d. *The absence of a clearly defined brief*

The absence of a clearly defined brief enables the students to identify issues that may no longer be apparent to the organisation's staff from an unbiased perspective. For the students, this contributes to the critical professional nature[5] of the situation. It helps them learn how to solve vague, wicked problems.

5 Critical professional situations are situations in which professionals are faced with a professional problem or dilemma (Grotendorst et al., 2006).

Caption:
Man: What... what was that?
Woman: That's an SVR student flying under the radar...
WHOOSH...

e. Time pressure

Time pressure contributes to the critical professional nature of the context and drives the students into each other's arms. They are in the same boat and have to act together.

f. Features of the participating students

At least seven different disciplines have been represented in each of the four years that the innovation lab has been run. Comments most often cited in the student interviews are "different from my own course," "learning to think out of the box" and "working together in a multidisciplinary way," which is precisely what the innovation lab aims to offer. The number of students from the Healthcare Technology programme taking this course feeds the assumption that the type of organisation for which the innovation lab works – in this case the hospital – is also a major draw for students. Extending the innovation lab to more and other types of organisations, as is currently suggested in the information about the innovation lab on the RUAS website, will probably make the innovation lab more attractive to students from disciplines related to those types of organisations.

g. Multidisciplinarity

Multidisciplinarity is an aspect on which the recruitment of participants is based and which students also find attractive. The issues that students gradually start to articulate also call for a multidisciplinary approach. The kind of multidisciplinarity needed cannot be defined in advance as it is only during the innovation lab that the students start to articulate these issues. But that does not seem to be a problem because regardless of the combination of disciplines, different views of reality always seem to converge.

h. Development of the group process

Because of the time pressure and the emphasis on the goal to be achieved, the students are more or less directly dependent on each other. They can only achieve results by actually working together. The teachers mainly leave it up to the students themselves to make arrangements in the group by withdrawing and not being with the group at times when the students need to make arrangements in order to make progress. The students feel less inhibited to speak when the teachers are absent and it is at that point that a team really starts to form, as they themselves admit.

i. Keek op de week

Each week of the programme ends with a reflection session known as "*Keek op de week*" (Look back over the week). During these sessions the students take it in turns to describe a high point and a low point. Occasionally they will be asked for their input by fellow students and teachers. In effect, this session is the start of peer supervision, but it does not end there.
Case-based reasoning comes up but is not dealt with systematically. Although the *Keek op de week* session is instructive, opportunities for learning are being missed. It would be worthwhile identifying case-based reasoning that comes up in this session and earmarking it for discussion by the group at a later stage – either in the entire group, in subgroups, in twos or individually, depending on the content.

j. Forms of teacher interventions

Teacher interventions are primarily designed to encourage students to reflect on their actions themselves and to get them to think about solutions. Other distinctive features of these interventions are:

- Emphasizing the autonomy of the individual student and the responsibility of the group;
- Keeping the group focused on the deadline and emphasising time pressure;
- Showing personal involvement. Showing yourself as a person in the group with your own personal circumstances and inviting the students to do the same;
- Providing input in the form of knowledge to facilitate the group, both on the initiative of the teachers and when requested by the students, without taking over or fulfilling the students' tasks and responsibilities;
- Picking up on incidents in the group process and associating them with a learning point.

There is also a critical point which should be mentioned here. Although incidents that come to light in the *Keek op de week* session are turned into learning points, this could be made even more effective if incidents were to be systematically picked up on in order to enable the students to internalize how to identify patterns and rules in them which they could transfer to other situations in the future.

A second comment that can be made is the fact that the level of personal commitment required of the programme's teachers makes the innovation lab very vulnerable in terms of staffing.

k. Location of the course

The location of the course – on the partner organisation's premises – is seen as very important by the stakeholders. This has a positive impact on learning, as also mentioned by the students. This aspect was made very clear when the students were unable to access the partner organisation's building for a week and had to fall back on their university premises. The group members immediately started interacting with their teachers in the role of dependent students. The students also noticed this happening themselves. From the point of view of learning theory, the importance of the location can be endorsed on the basis of the competence-based approach inherent in the innovation lab. Competences only become reliably visible in the authentic context.

l. Meetings with students

The teachers hold coaching meetings with individual students and progress meetings with groups of students at set times. Precisely how they do this was not observed. However, it was established that the students remained autonomous and appreciated the teachers' critical view of the content and process.

m. 10/10 week structure

During the first ten weeks (four days a week) of the innovation lab, the students work on innovative prototypes that benefit patients in the hospital. In the second ten weeks, the focus is on setting up a startup. This can follow on from what was developed in the first ten weeks, but the students can also go down a completely new path if they so wish. This has also been agreed with the ASZ. The possibility of setting up a startup is something that attracts many students to the innovation lab.

n. The competences of Learning to Innovate and the final assessments

These competences give direction to the students' learning and the coaching of that learning. The competences are: being innovation-driven,

being demand-driven, being collaborative, being able to engage in interactive learning, and being able to generate new knowledge. These are first assessed by the students themselves based on an assessment rubric in a portfolio which they have to submit and then by two assessors in an assessment meeting. Although all the students successfully completed the final assessment, there is still room for improvement in the extent to which students can express their own learning, for example by providing them with training in metacognitive skills. Metacognitive ability concerns factual knowledge about one's own cognitive system and its self-regulation (Veenman, 2015).

Observed elements of the innovation lab and teaching theory

Finally, we also looked at the theoretical educational aspects that go to make up an effective educational programme. The following features are clearly evident in the innovation lab:

- A clear end goal both in terms of content (the products to be delivered) and the process.
- A coaching attitude among teachers aimed at promoting the independent development of the students with individual and group feedback on content and process at agreed times.
- Knowledge and skills input by the teachers on demand, i.e. when requested by the students.
- An authentic, critical professional situation in which the learning process takes place.
- The personal involvement of the teacher and his or her ability to use coaching interventions to keep the students working autonomously in respect of their own work and that of the group at all times.

Conclusion and points for improvement

The conclusion takes the form of an assumption because it is not possible to demonstrate a causal link between the effective elements described and their success. However, it is likely that if the effective elements described are incorporated into other study programmes, the chances of achieving similar success will increase, since in most cases the effective elements can be directly linked to what we already know from teaching theory.

There is room for improvement in the innovation lab in the following areas: (1) Incorporating emphasis on formulating and (2) reflecting on the students' ability to act professionally and on (3) distilling transferable learning experiences.

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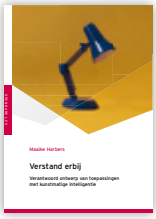

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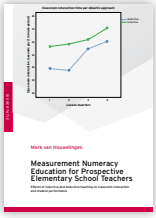

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