

The Silicon Venturing Rotterdam Innovation Lab

Observation report

January 2019



Practice-oriented **research**



ROTTERDAM
UNIVERSITY

UNIVERSITY OF
APPLIED SCIENCES

Contents

Foreword	4
Chapter 1: Introduction	5
Chapter 2: The research question	8
Chapter 3: Approach to the research	9
Limitations of the research	9
Information used in the research	10
Critical incident analysis	11
Summary of chapters	11
Chapter 4: Ingredients of the Innovation Lab	13
4.1 Concept and structure of the programme	13
4.2 The role of the partner organisation and hygiene factors	14
4.3 The informal position of students	15
4.4 The absence of a clearly defined assignment	16
4.5 Time pressure	18
4.6 Features of the participating students	18
4.7 Multidisciplinary	20
4.8 Development of the group process	21
4.9 Keek op de Week (Keek)	23
4.10 Forms of tutor interventions	24
4.11 Location of the programme	32
4.12 Meetings with students	33
4.13 The 10/10 week structure	33
4.14 The five competences of learning to innovate and the final assessments	34
Chapter 5: The SVR Innovation Lab in the form of a learning-theoretical guide	36
Chapter 6: Summary of the ingredients	40
1. Introduction	40
2. The question under investigation	40
3. effective elements of the innovation lab Silicon Venturing Rotterdam	41
4. Observed elements of the innovation lab and teaching theory	44
5. Conclusion and points for improvement	45
Chapter 7: Conclusion	46
References	47
Publication details	48



Foreword

Healthcare in the Netherlands is of exceptional quality. Not everything is perfect by any means, but in comparison with the rest of the world our healthcare system is among the top 10 in terms of quality, knowledge and accessibility.

Despite that, maintaining the status quo is not an option for the future. We have all heard the stories about the ageing population in the Netherlands and the enormous increase in chronic diseases that goes hand in hand with greater demand for healthcare services and the rising cost of providing them. In addition, the phenomenon of an ageing population not only applies to patients but also to the workforce that has to provide these services. There is no denying that this is a concern. But that does not mean that there is nothing a healthcare organisation can do about it. A hospital must prepare for a changing future by thinking about the day after tomorrow instead of focusing solely on today and tomorrow. Hospital healthcare is high-tech, with highly advanced treatment methods, but it is organised along relatively old-fashioned lines, with a conservative culture in which people have been used to doing things the same way for years. Changing to a future-proof way of providing healthcare is not something that can happen automatically. To achieve this it is necessary to show courage, to take a good look in the mirror and to ask yourself what you can do about the flaws you can see there. How refreshing and helpful is it when you allow outsiders to take a look inside your (extremely complex) organisation? And how helpful is it when these outsiders can then come up with innovative solutions which you might otherwise never have thought of?

There are various ways of getting outsiders to look at your organisation, but the way that I personally find extremely valuable is the collaboration which we have established in Silicon Venturing Rotterdam with Rotterdam University of Applied Sciences. By enabling students from different disciplines to work together in a high-pressure environment, one brings together an interesting mix of specialist disciplines which will ultimately lead to useful, innovative ideas of exceptional quality. I am truly delighted to come into contact with a new group of young people every year, and every year I am surprised at how we overlook real problems due to our own company blindness and at the crazy solutions that are put forward for them.

This report is an important step that will help transplant this concept to other institutions. For I would like to see every organisation, both inside and outside the healthcare sector, benefit from a group of smart, self-assured students who ruthlessly hold up the mirror to you and help you by coming up with great ideas.

Marcel Wilschut, innovator at Albert Schweitzer Hospital Dordrecht and contact person for Silicon Venturing Rotterdam students

Chapter 1: Introduction

Rotterdam University of Applied Sciences (RUAS, also referred to as “the University” below) and the Albert Schweitzer Hospital (ASZ) in Dordrecht have been working together on the Innovation Lab¹ since 2014. The ASZ is the partner organisation at which the students participating in the Innovation Lab carry out their assignments. As a result of the educational approach taken in the Innovation Lab, the students learn how to innovate and hospital staff are challenged to innovate with them. The students are given the assignment to seek out things that surprise them in what they observe at the hospital and to put forward ideas for improvements that are suitable for further development.

The ASZ does not define this assignment in any more detail in order to avoid influencing the students. The ASZ hopes that as the students are unhindered by previous knowledge of the hospital, they will come up with ideas for improvements and innovations which it may never have thought of itself.

The students are therefore given ample scope at the hospital to carry out their assignment. The student group is made up of 15-20 students from multiple disciplines. The emphasis on multidisciplinary enables them to combine the perspectives, knowledge and skills of the professions they are studying for in their quest to identify and seek solutions to problems. Students with economic, business, technical, nursing and social backgrounds work together on this.

The concept is based on the principle of “corporate venturing”². Alongside an existing organisation, this creates a group of people who can focus on innovating without being hindered by the kinds of limitations encountered in day-to-day practice. In essence, the group deals with the same customers as the parent company, but by coming up with innovative solutions they endeavour to serve their customers better than the parent company does at that point in time.

In the Silicon Venturing Rotterdam Innovation Lab (SVR), the students set up a **student innovation company** (Van der Star, n.d.) alongside the hospital. This venture is coached by RUAS tutors in close consultation with the contact person at the hospital. The “free” and challenging setup of the Innovation Lab offers the students plenty of scope to develop on a personal level. The students, who represent at least six different specialist disciplines, have a four-day working week, a workplace at the hospital, no predefined assignment or problem to tackle, and free rein to interpret the curriculum as they see fit. The students are required to identify their own problem at the hospital and define their own learning questions, both as a group and individually.

1 The Innovation Lab is a “minor+”. A minor is a cohesive set of educational components on a subject with relevance to a particular study programme. A minor+ is a collaboration between students and a leading company or organisation for the purpose of tackling a challenging issue in the region. Students on any study programme can take part.

2 Corporate venturing refers to the situation in which a large corporation takes a stake in a small, innovative start-up in order to benefit from its innovations. <https://www.ensie.nl/ondernemingsstrategie/corporate-venturing>

The learning goals for the students are to develop their knowledge of innovation processes, but first and foremost to develop competences relating to Learning to Innovate at RUAS: being innovation-driven, demand-driven, being collaborative, able to generate new knowledge and able to engage in interactive learning. The competences concerned correspond largely to 21st-century skills.


The objective for the hospital is to promote a culture of innovation by bringing disciplines together, introducing new insights and tackling problems from the perspective of new technological concepts. The hospital regards working with students as essential because young people are more willing to question existing routines and can bring a fresh perspective to the hospital's current problems.

RUAS specialises in developing educational programmes that prepare students for the labour market of the future. There is a need for programmes that contribute to the students' development of 21st-century skills in an evidence-based way. Within the University, this Innovation Lab is so far the only programme to be given the scope to experiment with the setup and collaboration with an organisation in the field concerned. Even in the experimental phase, the Innovation Lab seems to deliver added value in the eyes of all parties concerned: the University department carrying out the programme, the participating students and tutors, and the hospital.

At one point the University was considering stopping the Innovation Lab. However, the chair of the ASZ Executive Board wrote to the chair of the RUAS Executive Board to ask them to reconsider their decision because of the important contribution being made by the students to the hospital's innovative strength. In March 2017, the chairs of the two executive boards confirmed to each other that they would continue and strengthen the Innovation Lab.

The approach taken by the Silicon Venturing Rotterdam Innovation Lab has so far been intuitive and largely based on the experience of the tutor coaches involved. As part of the process, the students work on identifying ways to innovate with each other, with the tutors and with hospital staff.

Evidence of the success of the Innovation Lab can be found in many sources. The hospital's executive board writes as follows about it: "The RUAS students contribute to our innovation process and offer insights into how to improve it. They also develop a range of innovative solutions, some of which we have already applied at the ASZ. The extent of the innovation that is taking place is demonstrated by the fact that one of the Silicon Venturing students was recently awarded first prize for the most innovative idea in 2016 by the Dutch Association of Hospitals (NVZ)." According to their student evaluation, the 2017-2018 cohort of students give the Innovation Lab an average rating of 8 out of 10. The contact person at the hospital also speaks very highly of it (personal communication with M. Wilschut, innovation employee at ASZ). The ASZ's satisfaction stems from its satisfaction with the results achieved by the students.



The students of the 2017-2018 cohort added an additional element to the Innovation Lab. They organised a final event at which visitors were given the opportunity to experience the learning and working methods used in it in an experimental way. They decided to put on this event because they wanted to share the working methods used in the Innovation Lab with other interested parties.

During the event they recommended that this approach also be used in other educational programmes. They also communicated the features of the Innovation Lab in a factsheet (Newton & Kortenhorst, 2018). The fact that students want to actively bring the form of learning they have followed to the attention of other teaching staff and students at the University demonstrates that, alongside the products they come up with, they also rate the learning, teaching and coaching methods very highly.

This is therefore an opportune time to examine the concept, pose the question as to how the learning process works and how learning experiences come about, make the implicit working method explicit and, where possible, improve and enhance it. An explanatory and theoretically substantiated description of the concept not only makes it transferable but also allows a better case to be made for it within the University's educational programmes.

Chapter 2: The research question

The question addressed in the research is: What are the effective components that contribute to the success of the Silicon Venturing Rotterdam Innovation Lab (SVR Innovation Lab) and how can they be described in terms of active ingredients?

Both the students, the ASZ and the tutors describe the Innovation Lab as a success. The programme largely came about intuitively and is also implemented intuitively. Note that the term “intuitively” may also be interpreted as “*with tacit knowledge*” (Polanyi, 1966): with knowledge and skills, built up through experience, of which the owner is no longer aware.

The effective components will therefore have to be identified. One example that comes to mind is the “curriculum in use”: the way in which a programme is made visible in its execution, the qualities of the tutors, the tutor interventions, the learning assignment for the students, the context in which the programme is carried out, and the method of testing. Part of the success of the Innovation Lab could potentially also be attributed to the type of student that chooses to take part in it.

Chapter 3: Approach to the research

The researcher looked at what ingredients could be identified in the programme. It is risky to speak of causal relationships between those ingredients and the success of the programme since this would require much more intensive research than was carried out on this occasion.

The reasoning used in this case is that since the Innovation Lab is evidently successful, it would be worthwhile mapping out and describing its ingredients, on the assumption that if they were to be incorporated into other programmes in the future, those programmes would likely achieve similar success. A likelihood is not a guarantee. However, by linking the ingredients to insights from the literature, a connection can be made with educational aspects that have been found to influence the achievement of effective learning elsewhere. Thus an attempt has been made to increase the likelihood of the intended success being achieved if and when the relevant ingredients are incorporated into study programmes.

The aim of this report is to provide the reader with a detailed picture of the Innovation Lab in order to make the educational approach transferable and to allow the Innovation Lab to be applied by other parties besides those currently implementing it.

LIMITATIONS OF THE RESEARCH

- ▶ The observation was only carried out during one of the implementations of the Innovation Lab; one which, according to the tutors and the ASZ, differed from those in previous years in that the locations were changed and the hospital representative was less available than in previous editions. In addition, one of the two tutor coaches dropped out due to ill health and the other had to divide his attention between work and home life on account of a sick family member.
- ▶ Because observations were only carried out during the most recent edition of the Innovation Lab, it is possible that there were many other worthwhile tutor interventions and context conditions in previous implementations which should also be included in the envisaged transferable method. It is not possible to ascertain whether that is the case. According to one of the tutors, any form of benchmarking is bound to fail due to the differences between the groups in terms of the composition of participants, disciplines and the nature of the group process (transcription of *"Keek op de minor+"*)
- ▶ Partly for budgetary reasons, the Innovation Lab was only observed in part. The first few days were observed in full, but thereafter the researcher only observed the joint weekly reviews by students and tutors, the product presentations and the final event organised by the students.
- ▶ The presence of the researcher and the questions and follow-up questions he put to the tutors and students formed part of the process of this Innovation Lab and contribute – possibly unintentionally – to the effectiveness of the programme. As an example, one of the tutors remarked that the questions he was asked about his interventions suddenly made him think about things he would previously have done intuitively.
This effect is inevitable, since the aim of the exercise is to turn an intuitive approach into a transferable one.

INFORMATION USED IN THE RESEARCH

To enable the research question to be answered in a reproducible manner despite the limitations, information was obtained from the following sources:

- ▶ A letter from the ASZ Executive Board to the RUAS Executive Board.
- ▶ Student evaluations carried out by RUAS³.
- ▶ Recordings of observations from the first two days, which were the days on which the students were given information about the setup of the Innovation Lab and on which the students' group process got under way.
- ▶ Audio recordings of the weekly reviews, known as *Keek op de Week*, and the verbatim transcript of parts of the sessions on 14/09/2017, 29/09/2017, 27/10/2017 and 29/01/2018, in which the main experiences from the previous week were discussed. The fact that all students and tutors had to name a high point and a low point made it more likely that all the important events that the researcher was unable to observe would come to the fore.
- ▶ An audio recording and a verbatim transcript of a second conversation with the tutor J. Reijenga following observations halfway through the Innovation Lab (the second tutor had already dropped out by then due to long-term ill health). This was a conversation about observed tutor interventions and the way in which students communicate with each other (personal communication on 29/11/2017).
- ▶ An audio recording and a verbatim transcript of an interview with Marcel Wilschut, one of the two innovation officers at the ASZ acting as liaison between the hospital and the Innovation Lab/RUAS (personal communication on 15/11/2017).
- ▶ Audio recordings and verbatim transcripts of individual introductory interviews with participating students about their reasons for choosing this Innovation Lab and their expectations, used to establish whether a particular pattern can be observed in the reasons for choosing it, and if so, which.
- ▶ An audio recording and the verbatim transcript of a panel discussion on features of the Innovation Lab programme involving a tutor, a student, the hospital contact person and the director of the knowledge centre, which rounded off the final event organised by the students on 26/01/2018.
- ▶ An exchange of emails with an individual student on a specific unusual tutor intervention, used to establish how the student experienced this intervention.
- ▶ An email from Reijenga to Reekers.
- ▶ An audio recording and the verbatim transcript of a conversation with an alumnus of the SVR. This was a chance meeting which presented an opportunity to learn from a student's impression of an earlier version of the SVR and to ascertain whether their impression is in line with those of the participants in the Innovation Lab observed (personal communication with Tim van Driel on 02/11/2017).
- ▶ The competence profile with the five Learning to Innovate competences.
- ▶ An SVR factsheet (Newton & Kortenhorst, 2018) produced by the students which highlights the content and results of the Innovation Lab from the point of view of the participating students.

3 Six out of the 15 participating students completed an evaluation form. This in itself casts doubt on the validity of the evaluation. However, the fact that the students organised their final event on the educational approach of the SVR as a group, along with the learning experiences and descriptions given by the students in their factsheets, makes it plausible that the positive image projected by the evaluation broadly represents the opinion of the entire group.

- ▶ Description of Silicon Venturing Rotterdam version 1.1 (Van der Star, 2016).
- ▶ The memorandum “*Learnings en outcomes van 4 jaar Silicon Venturing Rotterdam*” by Reijenga (2018)
- ▶ The descriptions of the Innovation Lab on HINT, the RUAS intranet (<https://hint.hr.nl/nl/Minors/minors2018/ifm/silicon-venturing-rotterdam/?FromOverzicht=True>)
- ▶ The dossiers submitted by the students for their final assessments, used to establish the extent to which they are able to describe their own learning development.
- ▶ PowerPoint introduction to Silicon Venturing Rotterdam (Reijenga & van der Star, 2016).

N.B.: The conversations held were transcribed verbatim. The weekly reviews and assessment interviews were listened to in order to illustrate any learning developments revealed by the students. A total of around 45 hours of audio material is available. With one exception, all the verbatim transcriptions can be found in the appendices to this report. The interview with one of the tutors contains information about people who have not been included in the report for courtesy and privacy reasons. In accordance with current research policy, the transcripts, along with all the audio recordings and other information used, have been made available to the director of the Business Innovation Knowledge Centre, the party commissioning this research.

The same applies to all other audio recordings and student assessment dossiers.

CRITICAL INCIDENT ANALYSIS

From the multitude of data, especially the *Keek op de Week* audio recordings and the recordings of the final assessment interviews, for the purposes of this report the researcher mainly selected fragments in which incidents and statements emerge that provide an exemplary picture of the ingredients of the Innovation Lab as listed in point 5.

These incidents generally involve awkward situations. One example is an incident in which one of the tutors responded to a student in a very direct way. The student concerned experienced this as a low point, whereas the tutor experienced it as a high point. Situations such as these paint a particularly clear picture of the tutor's position. In making his selection from the available data, the researcher made use of “critical incidents”, a term coined by Flanagan (1954).

These are situations on which Grotendorst, Rondeel and Van Wijngaarden (2006) based their concept of “professionally critical situations”. According to them, these situations always involve a professional issue or dilemma, they always call for multiple qualities simultaneously, and they require the person concerned to confront their own values, norms, beliefs, opinions and emotions.

SUMMARY OF CHAPTERS

Chapter 4 describes the ingredients derived from the information used, as referred to in point b above. Most of this information can be found in the appendices to this report. The researcher looked at the contribution made by each individual ingredient and whether there were any caveats that should be mentioned.

Both the conversations with the ASZ representative and the tutors as well as the individual and group discussions with students are used to determine the significance of the ingredients. Chapter 5 looks at how the approach taken by the Innovation Lab relates to the theoretical aspects of learning and of an effective learning process. It also describes aspects that characterise the Innovation Lab, any aspects that may need strengthening and any aspects that could be supplemented.

Chapter 4: Ingredients of the Innovation Lab

Both the tutors involved repeatedly expressed doubts as to whether the Innovation Lab can be effectively described.

According to Reijenga, any form of benchmarking is bound to fail because the groups, the group dynamics, the mix of disciplines and the age structure of the participating students differ every time (personal communication on 19/01/2018). However, based on the information used in the research, which is listed in 3b, there are some ingredients that can be identified as constants. These ingredients probably contribute to the success of the Innovation Lab and clearly lead to the intended success each time, no matter how different the student characteristics and group dynamic processes may be, and despite the lack of a demonstrable causal link. The researcher therefore looked at ingredients that could be identified in the Innovation Lab observed and that, as far as can be determined, were also largely present in the previous editions. These ingredients are derived from the available information. The derived aspects are:

1. The concept and structure of the programme
2. The role of the partner organisation and hygiene factors
3. The informal position of students
4. The absence of an assignment
5. Time pressure
6. Features of the participating students
7. Multidisciplinarity
8. Development of the group process
9. *Keek op de Week*
10. Forms of tutor interventions
11. Location of the programme
12. Meetings with students
13. The 10/10 week structure
14. The five competences of Learning to Innovate and the initial, intermediate and final assessments

4.1 CONCEPT AND STRUCTURE OF THE PROGRAMME

The concept of Silicon Venturing Rotterdam (SVR) is based on the principle of “corporate venturing”⁴ (Van der Star, n.d.). Alongside the existing (parent) organisation, this creates a group of people who can focus on innovating without being hindered by the kinds of limitations encountered in day-to-day practice. In essence, the group deals with the same customers as the parent organisation. The aim is to find ways to serve the parent organisation’s customers better with the help of innovations. The Innovation Lab specifically sets out to attract students from six to eight different disciplines and succeeds in doing so, in line with the idea that achieving innovation requires a multidisciplinary approach.

4 <https://hbr.org/2013/10/corporate-venturing>

There is a clearly identifiable thread running through the Innovation Lab from the provision of the material via problem-based learning to a solution-oriented approach. The aim is to feedback learning experiences into the educational process as teaching and practice materials in the form of case studies. Whether this actually happens and what effect it has falls outside the scope of this research.

In the first few weeks of the Innovation Lab, attention is mainly focused on offering tools and skills: service management, entrepreneurship and corporate venturing, solution-based research, change management, risk management and project management. Topics such as team building, leadership, personal development (including a workshop on professional identity) and design thinking were also included.

According to information material (Van der Star & Reijenga, 2016) consulted by the researcher, attention shifts to a problem-based approach after three weeks. The observations show that students start observing and looking for trends and developments as soon as they arrive at the hospital. There is therefore a tendency towards parallelism in the provision of material and problem-based learning, even though the provision of material gradually decreases in intensity. In this problem-based approach, attention is paid to concrete issues that are currently topical in healthcare and issues that apply specifically to ASZ. These are complex issues which the interdisciplinary groups engage with.

After the first few weeks, students start working on finding solutions for the issues identified. They then present and explain their solutions to hospital staff in a presentation at the end of week 10 and again at an innovation fair held at the hospital.

After the first ten weeks, the focus shifts towards setting up a start-up using the 24 steps method (Aulet, 2013). During this time the important issue is whether a separate company (venture) can convert this added value into a profitable product. In theory this product could be purchased by the Albert Schweitzer Hospital, although this is not essential. There may also be other customers. The opportunity to set up other start-ups besides those intended for the hospital is intentionally left open.

The Innovation Lab programme has a set weekly routine. Every Monday starts with the students setting the agenda for the week, and they spend the rest of the day working on their research- or solution-oriented activities. On Tuesdays, one of the tutors is present and can also provide input in the form of a workshop. This takes place on either the tutors' or the students' initiative. There is no Innovation Lab on Wednesdays. The second tutor is available on Thursdays. On Friday mornings there are progress meetings at which the progress of the project groups that have formed around a particular issue is discussed. Individual coaching sessions and interviews with students also take place on Fridays. The week ends with a joint review of the week, the so-called *Keek op de Week*. This is usually followed by an informal get-together with a drink.

4.2 THE ROLE OF THE PARTNER ORGANISATION AND HYGIENE FACTORS

According to Wilschut, the ASZ contact person, there are a number of factors that should ideally be arranged by the organisation. He refers to these as *hygiene factors* which are taken care of

by the ASZ and which are also recommended for other organisations that may work with the Innovation Lab in the future. They are as follows (personal communication on 15/11/2017):

- ▶ A contact person in the organisation who is familiar with the sensitivities that exist in the organisation and has an internal network via which the necessary key people in the organisation can be contacted. This is important for helping students find the right contacts, but also for informing them about potential sensitivities and any areas where ideas put forward by the students may or may not be well received. The contact person should ideally have the backing of the organisation's executive board, so that the board can be kept informed and can help to address potential problems concerning sensitive subjects.
- ▶ The contact person must be sufficiently available for and contactable by the students and tutors. This necessity became even clearer when the availability of the contact person during the Innovation Lab came under pressure for reasons beyond his control. He was aware of this himself, but it is also clear from the student evaluations that the involvement of the ASZ representative left much to be desired.
- ▶ Locating the Innovation Lab within the hospital organisation. According to Reijenga (2018), this delivers the experience and challenge of working in the practical setting. It is also recommended that the students have their own space that they can organise themselves and work in without disrupting the organisation's primary process. The ASZ is also of the opinion that it is essential to base the Innovation Lab at the hospital. It is even considering setting up a special room for this. One participating student formulates this as follows: "I think working experience here in the innovation lab is very similar to that in a job, like we will be doing later on."
- ▶ The organisation, in this case the ASZ, wishes to break through the tunnel vision approach in its own organisation and promote out-of-the-box thinking. Healthcare is a sector that is undergoing major change. Wilschut: "A hospital is ultra-traditional. We use high-tech equipment but it is an old-fashioned, conservative organisation and we are not good at taking a look at ourselves to see what we could do differently. We want the hospital to learn that they need to look at themselves in a different way."

4.3 THE INFORMAL POSITION OF STUDENTS

If the employees of an organisation have innovative ideas, they pass through the structures of the organisation along what can sometimes be a long, formal path. Because of this viscous process, the people supplying the ideas often drop out. That is, at any rate, the process observed by the ASZ representative Marcel Wilschut (personal communication on 15/11/2017 and panel discussion on 26/01/2018). Students have an informal position and therefore stay under the organisation's radar. A student can say "Yo, I'm Koen, can I drop by?" And the reply is "Sure, any time." This informal pathway enables people to get things done that would be difficult, if not impossible, to achieve via the formal route. Wilschut gave an example of this: "What does happen, and this is how I think innovations come about, is that they work under the radar. Not illegally, but they don't form part of the organisation so they can do things that don't always follow the rules. They also think differently and act based on what they think is good. It is that youthfulness that helps them succeed. A few years ago there was a subgroup that was very keen to talk to a doctor. They wanted to record conversations in the consulting room. I explained to them that if I were to answer that question formally, I would first have to go to the Medical Staff Board to make a formal request to find a

doctor who would be willing to participate. Then they would tell me that they would put it on the agenda and then with any luck we would hear three months down the line that no-one is willing to talk to them. So I advised the students to just make some calls themselves. And they did. They sent an email to a doctor who thought it was a good idea. They spoke to this doctor, they were allocated time and they got the opportunity to observe in both the waiting room and the consulting room.”

The informal position that students occupy in the organisation may therefore make it easier for students to establish contacts in the ASZ organisation. It is not possible to determine whether this would also be the case in any other organisation, although it is not inconceivable that it may well be the case in highly protocol-based organisations.

4.4 THE ABSENCE OF A CLEARLY DEFINED ASSIGNMENT

The students are not given a specific assignment at the beginning of the Innovation Lab. This is done intentionally. At the beginning of the very first edition of this Innovation Lab, the SVR tutors made it a condition that the ASZ would not give the students a specific assignment or problem to solve. The ASZ representative also endorses this decision because he is of the opinion that any research question or assignment formulated by the hospital would reflect the ASZ’s mental models. Instead, it is about detecting issues that employees in the organisation are not (or are no longer) aware of because things have always been done that way. Wilschut: “If we let students observe without a framework, they find problems that we in the hospital don’t experience as a problem. I am proud of that. If they then ask why this has to be done by students, I reply that we should not be doing it ourselves because we don’t see these things ourselves” (personal communication on 15/11/2017). Reijenga states that: “...problems hide behind symptoms which most stakeholders have accepted as being the way things are done and no longer question them.” The assignment students are given is: look for a problem, find a solution, come up with tested prototypes and implement them in the organisation (Reijenga, 2018).

The absence of a clearly defined assignment and the act of inviting students to find their own problem and assignment results in what is known as a professionally critical situation. According to Grotendorst, Rondeel and Van Wijngaarden (2006), situations of this kind always involve a professional issue or dilemma; they always call for multiple qualities simultaneously; and they require the person concerned to confront their own values, norms, beliefs, opinions and emotions.

Therefore, these are not issues that can be resolved routinely by means of fixed procedures, protocols, etc. Matsuo (2015) similarly speaks of “challenging situations” in which an existing behaviour repertoire falls short and new approaches are needed to handle the situation successfully.

Grotendorst and colleagues set two criteria for such a situation:

- ▶ “It should be a practical situation that is representative of the core tasks of the profession, in which appropriate action is required.
- ▶ It must be a practical situation that calls for the integrated application of the essential knowledge, skills and attitude required for the profession.”

Jaspers & Speetjens (2007) contend that it must be a professional task that is linked to a result or objective to be achieved. The satisfactory achievement of a result or objective can also lead

to the conclusion that failure to achieve it is problematic and entails a risk of harm in the form of financial loss, loss of image for the professional's organisation, or stagnation in the progress of the work. Reekers (2017) gives a concrete interpretation of the professionally critical nature of a situation by formulating criteria which these situations must meet if the five competences of Learning to Innovate are to be expressed. Because these competences are used in the Innovation Lab, it is relevant to compare these criteria with the approach in the Innovation Lab. This comparison is shown in the table below.

Characteristics of a professionally critical situation	Method of implementation in the SVR Innovation
There is a need for a new or updated product, process or procedure.	This need is explicitly stated by the ASZ (personal communication with Marcel Wilschut on 15/11/2017).
There are no ready-made solutions available.	These are issues that first have to be recognised as such by the students and approved by the ASZ. Students make use of existing techniques but combine and/or adapt them for use in the ASZ organisation (personal communication with Marcel Wilschut on 15/11/2017 and Reijenga, 2018).
There is no clearly defined problem question available (you first have to try to clarify it).	Because there is no clearly formulated assignment, there is also, by definition, no clearly defined problem question. Indeed, the ASZ does not want to define a problem question since it feels that any question would be "coloured" by the organisation. It explicitly decided to start without a problem question (personal communication with M. Wilschut on 15/11/2017).
In order to achieve a result, it is necessary to work together on solving the problem or dilemma in an interdisciplinary way. The student represents one of the disciplines.	The kinds of problems that come to the fore only manifest themselves during the course of the Innovation Lab. It is not possible to indicate in advance which specific disciplines will be needed. It is up to the students to articulate problems.
Insights into the approach to the dilemma or issues are only available to a limited extent, if at all. These have to be found through the work carried out within the interdisciplinary collaboration.	This aspect forms the essence of the Innovation Lab. The issues identified are generally ones which the ASZ cannot yet see or no longer recognises as a problem. The nature of the problems also only becomes apparent during the course of the Innovation Lab. The students are intentionally recruited from 6-8 different disciplines (see website) and work together in the Innovation Lab in an interdisciplinary and transdisciplinary way (Reijenga, 2018). <i>NB: This number of disciplines has in fact been achieved in every year of the Innovation Lab.</i>
Lessons learned should be recorded for the organisation/commissioning party/professional practice concerned.	The Innovation Lab provides implementable prototypes in which the lessons learned are recorded. The only sticking point in this area is that after ten weeks, when the prototypes are delivered, the ASZ may want to continue working on them, whereas the students who developed them want to move onto something else (see also 4.13).

Table 1. Comparison of criteria for a professionally critical situation and the characteristics of the SVR Innovation Lab

With regard to the professionally critical nature of the assignment which students are given in this Innovation Lab, it can be concluded that all the conditions for this are precisely met.

4.5 TIME PRESSURE

The tutors put the students under pressure right from the outset. They do this by emphasising the firm deadline: they must come up with implementable prototypes within ten weeks. It is also made clear that all the time that passes until that deadline costs the hospital money. Tutor: “We are guests. We are here for free. We only pay on 1/11 [deadline date].”

The message about time pressure is constantly repeated. However, it is always the students’ responsibility to deliver on time. An excerpt from a *Keek op de Week* in September illustrates this well. One of the tutors is speaking: “In four or five weeks’ time there needs to be a house standing there, and I can only see half-pillars which I’m not sure are even pillars. But if nobody sees that problem, if you don’t think it’s a problem, then that’s fine.” This approach was already in evidence in the very first Innovation Lab, as can be seen from a statement made by one of the participants at the time: “The tutors kept on hammering away at what the aim was. Why we were there together. We were in an ASZ building in Dordrecht. We were told that we were having to pay for that in some way. How are we going to do that?” (personal communication with Tim van Driel, SVR alumnus, on 02/11/2017).

The time pressure the students are under to perform is something they are very much aware of. It is probably precisely a question such as “How are we going to do that?” that promotes the feeling of belonging to a group and buckling down to the task together.

4.6 FEATURES OF THE PARTICIPATING STUDENTS

De studentengroepen uit alle vier de lichteningen die tot nog toe de minor+ hebben afgerond waren afkomstig uit de volgende 18 studierichtingen.

	Discipline	2014-15	2015-16	2016-17	2017-18	Total
1	Healthcare Technology	4	3	5	3	15
2	Mechanical Engineering				5	5
3	Human Resources Management			1	1	2
4	Creative Media and Game Technology				3	3
5	Nursing				1	1
6	Financial Service Management				1	1
7	Technical Business Administration				1	1
8	Business Administration		1	1		2
9	Business Management and IT			1		1
10	Finance & Control	2	2	1		5
11	Small Business (Entrepreneurship)	1	3	1		5
12	Industrial Product Design			1		1
13	Education			1		1
14	Commercial Economics	4	3			7
15	Technical IT	2	1			3
16	Medical Assistance		1			1
17	Communication	3				3
18	Sports Marketing	1				1
	Total	17	14	12	15	58

Table 2. Disciplines of students participating in the SVR

The Healthcare Technology programme has been the most frequently represented. This is probably due to the fact that the Innovation Lab has so far been specifically geared towards innovation in a hospital, with the emphasis on technological innovation. The information which students receive about the Innovation Lab via HINT, the university's intranet⁵, casts a wider net by stating that the participants in the Innovation Lab work for "Rotterdam-based partner companies".

This implies that there may be a wide range of companies involved, and that is in fact the case per se, even though the ASZ in Dordrecht has so far been the only organisation to participate. Despite the current focus on a hospital, the table reveals that students from other disciplines also choose to take part in this Innovation Lab. The description of the Innovation Lab on HINT starts with generic recruitment texts that could appeal to students regardless of their field of study: "Do you like uncertainty? Do you have the courage to make mistakes together with your tutors? Do you want to invest more in your future? Do you want to work with other people to translate your knowledge of entrepreneurship and technology into work? Do you enjoy developing solutions for complex problems with other people? Then sign up for the Silicon Venturing Rotterdam (SVR) Innovation Lab."

There is no information available about the factors motivating the first three cohorts of students to sign up for the Innovation Lab. Introductory interviews were held with the students in the fourth cohort during the first two weeks of their Innovation Lab. In these interviews, they were asked about their motives and what outcomes they expected to achieve. As can be seen in table 1, the recruitment description on the website fits in quite well with the motives mentioned by the students.

Motives cited	Frequency	Expected outcomes	Frequency
Thinking out of the box	5	Thinking out of the box	5
Different from my own course	9	Motivating people to change	1
Independence/freedom	3	Taking a leadership role	1
Entrepreneurship	4	Start-up	3
Making something new	1	Delivering a product/something completely new for the hospital	6
Working together in a multidisciplinary way	5	Collaborating with others better	5
Combination of technology/people	1	More interactive	1
Recommended by alumnus	4	Reducing uncertainty	1
Company form of SVR	1	Experience in a business context	1
Market potential of the healthcare sector	1	Improving efficiency in the hospital	1
		Increasing self-awareness	1

Table 3. Motives and expected outcomes, 2017-2018 cohort (n=15)

In the interviews, the students also discussed the outcomes they expected. Table 3 provides an overview of these.

⁵ <https://hint.hr.nl/nl/Minors/minors2018/ifm/silicon-venturing-rotterdam/?FromOverzicht=True>

Students very often indicated that they were looking for something different from their own study programme, while working together with the same students and being taught by the same tutors. Multidisciplinary collaboration and out-of-the-box thinking seem to be aspects that students find attractive.

Comments most often cited 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 representatives of the Healthcare Technology programme 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 types of organisations, as is currently suggested in the information about the Innovation Lab on HINT, will probably make the Innovation Lab more attractive to students from disciplines related to those types of organisations.

4.7 MULTIDISCIPLINARITY

Multidisciplinarity is a factor that is emphasised as early as in the recruitment stage. The website states the following: “Students from all possible study programmes in and outside the university (including international students) are needed to tackle this issue together. Depending on the assignment, they could be future healthcare technologists, computer scientists, commercial economists, traffic experts, product designers, business economists, IT specialists, technical business experts, and so on. Virtually any discipline would be appropriate.” However, technology is a term that crops up time and again; along with the fact that the Innovation Lab has so far taken place at the ASZ, this could therefore explain why it has predominantly been attracting Healthcare Technology students (see table 2). Despite that, at least six different disciplines have been represented in each Innovation Lab, in line with expectations.

There is no mention of a minimum spread of disciplines or an indication that one or more specific disciplines should always be represented. This could, for example, lead to the assumption that the Healthcare Technology programme, which in this case is very closely associated with the core of the hospital organisation’s innovative ambitions, should always be represented. In any event, it is striking that this study programme is represented by several participants in each cohort of the Innovation Lab. In this research, no grounds were found to support or refute the assumption.

It is also clear that at the student recruitment stage it is not possible to say which disciplines might be needed, since the issues are only articulated by the participating students during the course of the Innovation Lab. It is clearly the case that every mix of disciplines has so far led to success. Whether there is a relationship between the composition of the mix and the success of the Innovation Lab cannot be determined on the basis of this research, however. It may be that the mere presence of multiple disciplines from any fields leads to the formation of multiperspective views of reality.

In that case, the subject matter may not be particularly important. One student’s comment seems to point in this direction:

"I realised that you don't have to possess a specific ability yourself as long as you make a good team. That you can still come up with ideas in areas you don't understand yourself and implement them. And that an idea in another discipline is not impossible."
(Keek op de Week 29/01/2018).

In light of the above example, diversity per se certainly seems to have an inspiring effect. As can be seen from the individual introductory interviews, students find working together with students from other disciplines stimulating, and they did indeed work in a multidisciplinary way on the prototypes they delivered. As the issues that are articulated require a multidisciplinary approach, working in a multidisciplinary way is an essential part of this Innovation Lab and contributes to its success. On the other hand, it is not yet clear whether the content of the disciplines represented also contributes to that success. It may be observed that a hospital organisation encompasses a wide range of aspects, not all of which are closely related to healthcare, meaning that there are probably opportunities to pick up ideas with any mix of disciplines. It could be that the types of ideas and prototypes are a reflection of the multidisciplinary mix present. Whether this is the case could not be established within the current implementation.

4.8 DEVELOPMENT OF THE GROUP PROCESS

Due to the time pressure imposed on the group members, they do not have much time to adjust to each other. This adjustment process may be being accelerated by the fact that they are confronted with this time pressure from the outset and that they are very much aware that they themselves are entirely responsible for the results to be achieved. The tutors help by coaching individually and in groups and holding workshops at the students' request. One of the tutors constantly posts scientific articles which he believes may be of interest to the students and which relate to aspects they are currently working on.

The tutors never take over the assignments which the students have to complete, so the students remain the owners of the problems at all times. This ownership seems to be best illustrated by the fact that the tutors leave the group at the point when they have to make arrangements. Reijenga: "There are times when we should deliberately stay away."

One student says the following about this: "What I noticed in the first few weeks was that discussions only really got going when you [the tutors] had left the room. Then a lot more people started talking. So I think that needs to happen to get the discussion going." Another student adds: "You really do need to form a team. It's only then that we saw a team actually emerge."
(Keek op de Week 29/01/2017)

Reijenga: "The idea is that teams form more readily when we deliberately stay away than when we are there. We just know – and you tell that by the fact students have created a Whatsapp group between themselves apart from the group app in which the tutors participate – that even if we tutors try to stay neutral, you are more willing to talk when we aren't there. So I am interested in what you all think about that, based on the researcher's question." (Keek op de Week 29/01/2017)

Student: "We were really thrown in at the deep end when it came to making choices and decisions in that first week. It was quite awesome to see how we did that as a team without any help. Actually, we might have secretly asked you for a bit of help, but we didn't really want to accept it. Interesting to see how we made decisions in that first week." (*Keek op de Week 29/01/2017*).

It seems that it is precisely because the tutors stay away at times when the group has to make decisions on the approach they take that they actually make them and retain responsibility for them. The fact that they are all in the same boat, knowing that they are under pressure to deliver in a short space of time and that they actually need each other to do so, may well contribute to this.

A similar picture emerges from the interview with a student from the first Innovation Lab cohort:

"My experience was that at the start of the Innovation Lab, tutor feedback was very tough indeed. The tutors kept on hammering away at what the aim was. Why we were there together. We were in an ASZ building in Dordrecht. We were told that we were having to pay for that in some way. How are we going to do that? First of all, you need to get to know each other. But to begin with, I don't know how to say this... a few problems were created. So your self-confidence did crumble a bit and you realised you were in the shit together, to quote the tutors. And you had to start building things up again together." "You're all there together and you have to make something of it. That's why I say you don't really feel comfortable but you have to get on and do it anyway. Because you don't want to fail yourself, you don't want to give up in front of the group, so you just have to tackle it together. And I really think that is something very valuable as it enables you to learn in such a safe setting." (Personal communication with Tim van Driel on 02/11/2017)

In their introductory interviews some students point out the difference between the SVR assignment and the assignments they are generally used to receiving at university. The group members do not necessarily need each other to complete academic assignments. In the SVR, working together is essential if they are to achieve a result.

Furthermore, the students are present in the same room full-time four days a week. Reijenga: "If you really want to collaborate, you have to get to know each other. And that takes more than one hour or so," and "In this case they are spending four days in or close to the hospital. And in such close proximity – it's almost like being married, when the novelty starts wearing off after a few weeks and you start getting irritated with each other."

The open assignment, the time pressure, the emphasis on taking responsibility and working independently all seem to make the participating students feel that they are in the same boat – albeit uncomfortably to begin with – and that they have to work together to produce a positive outcome.

4.9 KEEK OP DE WEEK (KEEK)

The *Keek* is a weekly group review session lasting for about two hours, in which students and tutors look back at the previous week. They then round off the week with a drink. The *Keek* came about quite by chance when students in the first cohort had a room which they were able to furnish themselves. They managed to find some sofas which they arranged in a pentagon shape in the room. This became a place where students and tutors could sit down and talk to each other. It was first nicknamed the “*Pratagon*” (a play on the Dutch verb for “to talk”) and later became known as the *Keek op de Week* (Look back over the week). It then went on to become a structural part of the Innovation Lab.

During the *Keek*, each student and tutor, and the researcher in the Innovation Lab observed, gets an opportunity to speak. Everyone shares a high point and a low point with the group. The other participants can ask questions about their contribution. When a participant has finished, it is the next person’s turn and so on, until everyone has had their say.

The high points and low points can relate directly to things happening in the Innovation Lab but may also relate to salient events outside it. This means that highly personal aspects may be discussed which can lead to participants making themselves vulnerable. The tutors take the lead in this and are generally of the opinion that if they make themselves vulnerable, this makes it easier for all participants to do the same.

The open question “What was a high point and a low point for you last week?” aims to get the students talking about their own most positive and negative personal experiences. The focus is on how the situation was experienced. In this sense it is similar to a critical incident analysis as originally formulated by Flanagan (1954).

High points and low points are indeed put forward and in doing so, the participants’ values, norms, attitudes and emotions are indeed revealed. The participants also take a critical look at themselves. This indicates that the students generally feel secure enough to be able to place themselves in a vulnerable position.

The tutors also encourage the students to bring up things they perceive below the surface of the group process. An example of this is given in the section on tutor interventions (see also the transcription of *Keek op de Week* 29/9).

Emotions sometimes run high. For example, one participant in the group directly criticised the way another member of the group had acted (*Keek op de Week*, 27/10/2017). One of the tutors has also occasionally made heated contributions. For example, a student mentioned in a *Keek* that a tutor had told her to “bugger off...”. She found this unacceptable for a tutor but did not want to reveal who actually said it. Later, one of the tutors mentioned that a high point for him had been that he had been able to say “bugger off”. Incidents such as these remained undiscussed, or only discussed in passing, in the *Keek* itself. Leaving situations such as these undiscussed in the group can give the impression that this method of communicating is clearly permissible, as one of the tutors concludes (personal communication with Reijenga).

In another incident mentioned in a *Keek op de Week* that took place in week 2 (appendix 1), the group started to discuss how to work with observed data and with trends and developments they have spotted. The tutors were not present. At one point, a subgroup of a few students left the room as they felt they were not being heard by the rest of the group. This was discussed in the following *Keek op de Week*. A low point put forward by one student was that the work done by his subgroup was barely used at all. In the discussion that ensued, the group members showed themselves very willing to help. What is also apparent is that the students' contributions are not discussed systematically, with the result that they often get no further than simply being flagged up. Objectives, emotions, content, procedures and process aspects become completely mixed up. Attention also tends to be focused on the contributor, leaving the subgroup they form part of completely out of the picture.

These incidents illustrate that there is scope for the *Keek* to develop as a systematic method and that it could be enhanced with a systematic peer supervision approach towards developing a new behaviour repertoire, as is the case with the critical incidents approach. Reijenga also recognises this when he describes how the *Keek* came about by chance. He notes that there may be a need to define some rules for the *Keek*. That something along these lines would be advisable is illustrated by a comment made by a student expressing a criticism about one of the others: "Could I just ask a question? Was this not the right time to say that? Because I thought that was what the *Keek op de Week* was for."

Reijenga (2018) refers to the *Keek* as peer supervision. Elements of peer supervision are certainly present, albeit fragmented. High points and low points come to the surface, but there is scope for working more systematically on a new behaviour repertoire for the students. The *Keek* is probably not particularly suitable as a peer support method *per se*, although an attempt can be made to extract case studies from it which could then be discussed using a peer support method (Hendriksen, 2009). The case of someone who feels that their contribution is not being given proper recognition is an example of something that could, for example, be worked out systematically in peer supervision following on from the *Keek*. This would presumably help students learn about collaboration processes.

4.10 FORMS OF TUTOR INTERVENTIONS

At the beginning of the Innovation Lab the tutors specify that they are part of the group. Reijenga (personal communication with Reijenga on 29/11/2017): "Here in the SVR we do in fact say that we don't refer to ourselves as tutors. Because we are here as a learning community. We have no monopoly on wisdom. But we are slightly more experienced in some areas, although we also don't know very much. We never know where we will end up, and we tell them that. We do know that the ultimate goal we want to achieve with the students is the five competences of Learning to Innovate which we assess them on at the end. But what we don't know is what will happen on the journey there, how it will happen, with whom, and what products will come out of it. And to be honest, that doesn't matter anyway, because it is the process that makes things happen and, all being well, these things are a logical result of the problem you have found."

The aspect of “being human” is emphasised by pointing out that personal circumstances play a role in the way a person functions. “Share it” is the advice to students, “because the clock is ticking.” The tutors set an example themselves by sharing their personal circumstances. This makes it “normal” and encourages the students to do the same. This aspect is also put into practice by the tutors right from the start, and the students notice it, as the following quotes illustrate: “I like that you are also sharing a private problem and you set a professional example by staying positive when you have problems” (*Keek op de Week* on 26/01/2018).

The tutors intervene in respect of the content, the procedure and the process. At the start of the Innovation Lab the focus is on content-related input in various forms.

4.10.1 Content- and procedure-related interventions

The following content-related interventions were observed during this Innovation Lab:

- ▶ Normative input: All businesses must be “healing”, taking account of people, planet and finances.
- ▶ Method-based input: the diverge/converge model, placing emphasis predominantly on diverging, an important activity in articulating stakeholders’ needs.
- ▶ Procedural input: Students are tasked with implementing the SVR as a business and to decide how they want to organise themselves. They are told to formulate answers to questions such as: who are we as the SVR, what is our objective, what resources do we have, what do we want to achieve, who is good at research, and who is good at problem solving? They are tasked with setting up an SVR organisation.
- ▶ Input in the form of a business case study that is presented every Monday afternoon.
- ▶ Input in the form of workshops such as Design Thinking (see 5.1).
- ▶ Input in the form of an imposed methodology: Aulet, B. (2013) *24 steps to a Successful Start-up. Disciplined Entrepreneurship*. Indianapolis: John Wiley & Sons.
- ▶ Input which the students request themselves.
- ▶ Input in the form of relevant articles posted on the group app.

All the input relates to supporting students as they carry out the tasks for which they are responsible. Since the tasks remain the responsibility of the students, as a rule no input is provided on how the students should carry out these tasks. However, there are some exceptions in practice. One concerns the formulation of a vision for the SVR, an assignment that is given to the students. While the students are working on formulating their vision, one of the tutors produces his own version for the students to use as a guide. To begin with he indicates that he wants to discuss it with the students, but a little later on he decides not to and defends his vision by saying: “This has to do with our dream.” This is the only observed intervention that does not fit in entirely with the way in which input aspects are otherwise handled. If anything, it would fit in with the aim of the Innovation Lab relating to self-organisation, i.e. to get the students to critically examine the vision and to think about their own choices in it. An example of how the same tutor tackles this very differently and probably more effectively is given below.

A second exception is the introduction of the 24 steps as a methodology for the second ten weeks, in which the students start to look at the possibility of a start-up and, if possible,

implement it. The use of this method is imposed based on the consideration that Aulet, the author, having researched more than 500 start-ups, has ascertained that the 24 steps described are appropriate. Students have discovered that these steps are indeed essential, but there were two students who did not want to follow the steps. This did not have a direct impact on their final assessment, although they were held to account by the group and the tutor, albeit without much success. This raises the question as to how this compulsory part, however good it may be in itself, relates to the personal responsibility and independence that is so clearly profiled at the beginning of the Innovation Lab. The introduction of the 24 steps was not observed, so the way this was done cannot be ascertained on the basis of observations.

In a future edition of the Innovation Lab, it may be advisable to pay extra attention to the compulsory inclusion of methods. It should also be noted that the 24 steps are of a facilitating nature. The students remain responsible for content-related aspects of their start-up and for setting it up independently.

4.10.2 Process-related interventions

Besides content-related input, there are various ways in which the tutors intervene in the process. The students are responsible for the tasks which they have to carry out and the way they tackle them. However, they are asked critical questions about them, both in individual student interviews and in discussions with subgroups. The discussions take place on the students' initiative but the tutors can also initiate discussions themselves. They also encourage the students to pitch their business ideas.

If the tutors need to intervene in the group, they usually do so in a very specific way. This seems to be typical for how they go about their work. For this reason, this aspect is examined here in more detail based on fragments of conversations since, to quote Johan Cruyff, you can only see it when you get it.

The principle is already apparent in a minor incident that took place on the first day of the Innovation Lab. If the members of the group are sitting randomly so that not everyone has a direct view of the tutor who is speaking, the tutor will deliver an emotion-based intervention by saying: "I am sitting uncomfortably now." He does not act on that emotion, and the members of the group take action themselves and adjust their positions. This principle can be examined in more detail based on the group discussion during the *Keek op de Week* in approximately week 4 of the Innovation Lab.

The tutors have observed that the spirit of collectivity in the group has been under pressure. Some participants withdraw into their own product subgroups. There is also one subgroup which has taken on the task of management team but is not carrying out its role effectively. The tutor brings it up by first sharing an emotion in very broad terms.

Then the group members start thinking about what he might mean and the group gradually comes to the realisation as to what is going on below the surface themselves. The tutor makes sure that the group always feels responsible for their own process.

"Tutor 1: I would first like to single out the K en S c.s. group, when you see what a low point they came out of and how they have found their way up to the top now. But I would also like to emphasise that this is a subgroup. But I am concerned about our group as a whole. Whether we are in fact seeing the finishing line properly, and whether we can continue with the plans we have with each other or will have to develop them or whether they will produce the right effect.

Student: What is the right effect?

Tutor 1. The one you want. So what your objective is, essentially. When are you all satisfied now? When are you all happy? You yourself must be happy, mustn't you? That's my feeling. That's why I told you [student] that it doesn't look right to me. We're having a nice chat now, but I'm not entirely happy with it.

Student ME: We'll have to do something about that.

Tutor 1: Well, I don't know about that.

Student M [to tutor 1]: What would you like to do, then? When will you be happy?

Tutor 1: It's not about me. Obviously you don't feel the same way as I do because I'm not hearing anyone mention anything about it in the ups and downs."

Tutor 1: Perhaps I should be more specific. I spoke to someone who I thought looked very down, and that had to do with the progress.

Student E: You say that it's concrete but I can't follow it yet.

Tutor 1: Well, let's just say that I had the feeling that someone was quite down. Do you get the feeling that we're going in the right direction together?

Students: I do! Me too!

Tutor 1: Together?

Student: No, not together."

The method of intervention is very similar to the technique used in Leary's Rose (Van Dijk, 2015), a very old model published by Leary in 1957 that is still relevant today (see figure 1).

In the example, the tutor places himself in the bottom right quadrant; the underlying message is "I notice something and nobody shares it so it will be up to me". He follows the group's opinion. He sits on the "together side" of the model by putting the interests of the group ahead of his own. According to Leary, "above behaviour" invokes "below behaviour", and vice versa. The

tutor's "below behaviour" invokes "above behaviour" from the group. The group starts looking for what the tutor means, thus arriving at the diagnosis of the problem by themselves.

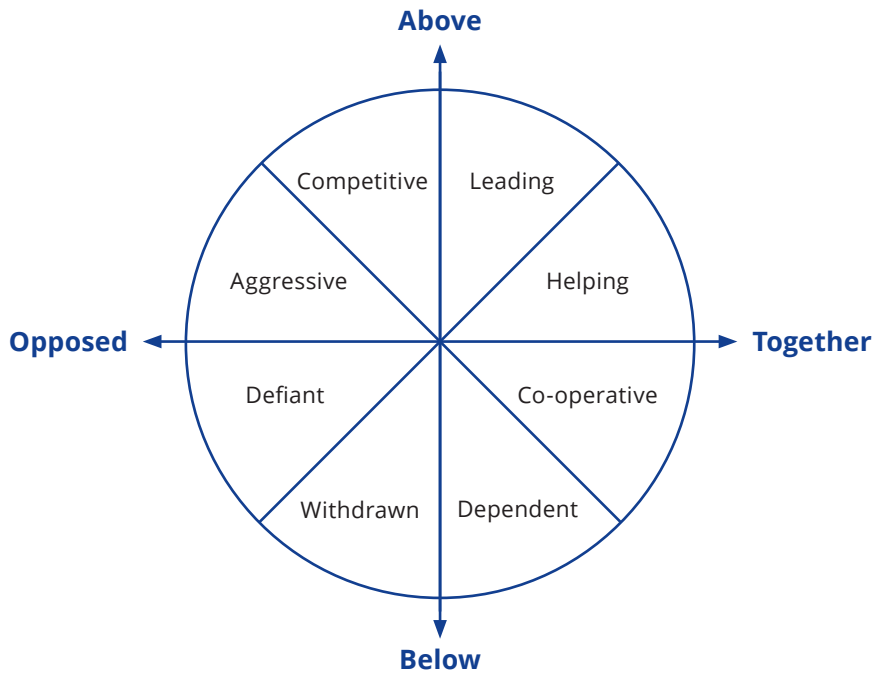


Figure 1. Leary's Rose (Van Dijk, 2015)

The second tutor also plays a role in interventions of this kind. He keeps apart from the others to begin with so as to give the group the space to process what the first tutor is aiming for. When that has happened, he defines the issue in more detail. The following fragment illustrates this:

"Tutor 2: I think that tutor 1's concern is more about whether the 15 of us really have the feeling that the 15 of us can make good progress and whether we can do that as a group, or is it the various subgroups that are working on their own and have lost sight of the overall picture."

Students: The latter.

Student: I agree with tutor 1."

Tutor 2 also sees for himself that he is taking on this role. He says that he is taking on the role of bridge builder. He reports that students in a previous cohort had collected quotes that characterised the tutors. The quote that characterised him was: "I think what tutor 1 is trying to say is ...".

The effect of this – perhaps not even conscious – behaviour on the part of the tutors is that the students come into action themselves, take on the leading position in the Leary model,

remain responsible for their own group processes and articulate the issues that are taking place between them themselves. In a memorandum, Reijenga (2018) refers to Volberda and colleagues who give three recommendations that become apparent in the tutor interventions in the Innovation Lab: Encourage self-organisation; develop informal leadership; and help employees develop new skills. Students express this in their evaluations by marking the extent to which the tutors encourage them to take the initiative with a score of 4.8 out of 5.

In the same group discussion, it ultimately comes to the fore that the problem in the group concerns the way the management team, which they themselves set up, is functioning. The following fragment illustrates how the tutor encourages the group to learn from the situation. It shows how one of the students who starts off by passing the problem on to the management gradually develops his own role in it. In the meantime, the tutor incorporates information on effective collaboration between the management and the people carrying out the task.

“Student ME: It is partly our communication. We’re not communicating enough with each other. We’re also very focused on our own subgroup and are not looking at the overall picture. But I do find that management should be keeping an eye on things [NB: three of the students make up an MT].

Tutor 2: I think that this is also what concerns tutor 1, what you’re saying now.

Student ME: It could also have partly come from me, but I’m not management so I don’t have to pay much attention to that.

Tutor 2: That last comment doesn’t sound too good to me, you know. ‘So I don’t have to...’ That phrase worries me a bit.

Tutor 1: Now I’m just hearing my concern confirmed, and I think that’s quite telling. If you [student ME] are referring to someone, and you’re doing that inadvertently, even if you say you aren’t doing it.

Student M: I think you should all FEEL responsible, not say, but FEEL; that could be the difference.

Student R [to student ME]: Are you missing the sense that the MT are leading us, carrying the load, encouraging us?

Student ME: Yes, but I also have a problem persuading myself to tackle the vision as well, but I am so keen to finish off my project and we don’t have much time, so you throw all you’ve got at it. That could be a learning moment for me, namely to look back at the group as a whole even when you’re fully immersed in it.

Tutor 1: Are we helping the three members of the MT as a group? You are expecting something to come from the MT that isn’t coming. My question is: are you helping the

MT to carry out their task? And how? There is such a thing as leading up/managing up. We think we have people in our midst who can manage. That's not possible. They can only manage if we help them to manage. If you go and work for a company later on, I hope you will help your manager. The most predictable reaction is complaining about the sons-of-bitches over the water cooler. If that's the case, then I know one thing for sure: the house won't be built and we'll be out of business by 1 November [the prototype deadline] and I'm not joking. Then SVR will be bankrupt. I don't know whether that is getting through to you but the SVR team can only be a team and can only succeed if we are all successful.

Student ME: So how should we go about that?

Tutor 1: Good question. Can we help the MT?

Student: Yes

Tutor 1: So let's do it.

Student: How?

Tutor 1: ASK THEM! You're talking about people, well here they are.

Student: I am only mentioning it because tutor 1 is mentioning it.

Tutor 2: We are talking a lot about them [the MT members] but not with them.

Student: So what can we ask them to do?

Tutor 1: Try asking them.

Student: OK then."

The fragments illustrate how the tutors intervene and how the students are "taught" to behave effectively in relation to the manager's role. As a rule, this also has value for future situations which the students will experience. The students are without doubt learning, but whether they are also learning this more generic lesson and inferring a pattern or even a rule from this incident is not apparent in this fragment. In any event, the tutors do not pay attention to this in this example. Students probably learn even more effectively if they do specifically stop to think about the generic value of an incident. It is possible to work on pattern and rule recognition through systematic reflection, as visualised in the diagram below.

Increasing complexity in reflection

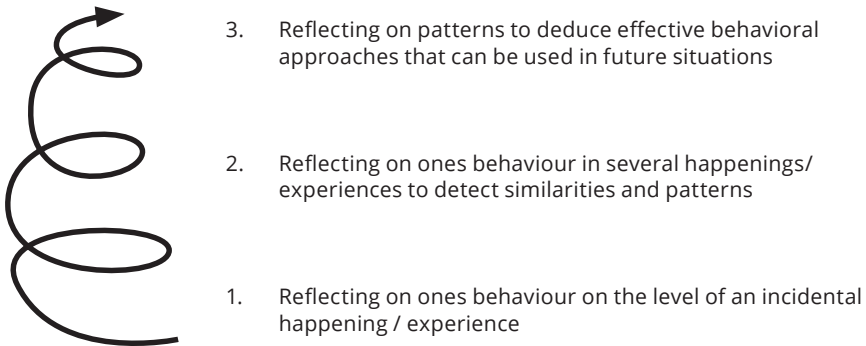


Figure 2. From incident to pattern and rule via reflection

The aforementioned collaboration between the tutors involves one aspect that has not yet been touched on. Tutor 1 is someone who reacts very directly, which can result in outbursts on his part or to utterances that could be regarded as questionable from a normative point of view. Students call him the “bad cop”, whereas they called tutor 2 the “good cop” (Newton & Kortenhorst). Tutor 1 reacts directly. He does not seem to take the time to think before speaking. He himself calls this “intuitive”.

The incident from a *Keek* referred to above (*Keek op de Week* on 29/09/2017), in which a student described an occasion when a tutor told her to “bugger off” as a low point, is an example of this. Although perhaps not something to be repeated literally, it is an example of the tutor reacting “from the gut” and expressing an authentic feeling. Despite the fact that the student in question criticised what the tutor said, she specifically thanked this tutor in her final assessment dossier. The student explains this afterwards as follows:

“... On the other hand I think he means well and wants the best for everyone. I recognise that a bit in myself, and although I would like to emphasise again that it is not a particularly useful quality in a tutor, I do appreciate the person that this tutor is. That may be because he also showed his vulnerable side and therefore my opinion shifted from “I think he’s shit” [i.e. angry] to “rough diamond” [compassion].”

Expressing an opinion straight from the shoulder, authentically, is something that characterises this tutor and that was enormously appreciated by the group of participating students. Reacting emotionally because he wants the best for everyone is probably the best characterisation. A student illustrates this as follows:

“Occasionally two tutors would come storming in, saying this is wrong or that’s going wrong and you have to rethink it. Or you would go to see them and you’d be set off down another path and then you’re thrown in at the deep end and you have to gather your information yourself. You have to change to get ahead.

I think that's what makes it interesting, so I don't avoid the challenge. I like taking that responsibility. So it energises me. This method of learning suits me."

A final characteristic feature is that the tutors are committed with heart and soul to the programme, which is evident in their open attitude towards the students. They even share personal events that impact on their lives with the students – in the same way that colleagues at work who have a good relationship with each other would share personal things. Personal involvement invites the students to do the same.

This personal involvement also makes the Innovation Lab vulnerable. That became clear when one of the tutors dropped out halfway through the Innovation Lab due to ill health and the other had to deal with a seriously ill child, as a result of which the situation at home took up more of their attention. Putting one's heart and soul into something requires commitment, or as one of the tutors commented: "You can't just 'do' an SVR." It was not possible to find a replacement for the sick tutor at short notice. This made the Innovation Lab particularly vulnerable from the point of view of staffing.

Finally, it can be stated that tutor interventions have a number of characteristic features:

- ▶ Emphasising the group members' responsibility for themselves and for the group itself.
- ▶ 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 tutors and when requested by the students, without taking over or fulfilling the students' tasks and responsibilities. Getting students in group processes to think about things and take action themselves in their group process (the Leary's Rose intervention).
- ▶ Picking up on incidents in the group process and associating them with learning input (the example of the MT incident).

There is also a critical point which should be mentioned here. Although incidents that come to light in the *Keek* 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 internalise how to identify patterns and rules in them which they can consciously transfer to other situations in the future.

4.11 LOCATION OF THE PROGRAMME

Over the four years since its inception, the Innovation Lab has been located in or near the hospital itself. A change of location was required for the Innovation Lab observed. To begin with, including during the first ten weeks, the Innovation Lab was housed in an outbuilding on the hospital site. It was already known at the outset that this building would not be available for the entire duration of the Innovation Lab as it was earmarked for training courses for hospital employees in connection with the introduction of electronic patient records. The Innovation Lab ultimately found a home at the Sustainability Factory at Da Vinci College, about 1 km away

from the hospital. As there was a short period when neither location was available, the students were accommodated at RUAS for an extra week. The group members were not happy with this, although it did illustrate that the location of the Innovation Lab plays an important role.

Wilschut of the ASZ, students and tutors all agree that the Innovation Lab should be based at the partner organisation. The hospital is considering creating a permanent space for innovative educational initiatives aimed at improving patient care. Students and tutors noticed that the week at the teaching location with its classroom setup immediately led to “school behaviour” (*Keek op de Week* 29/09/2017), while the students experienced working at the hospital location as “work”.

A student expressed surprise that the new RUAS building with its smart sofas and chairs, power outlets and fast WiFi everywhere was nowhere near as pleasant to work in as the dilapidated location at which they were housed at the hospital (*Keek op de Week* 27/10/2017).

Having their own space at the hospital where they work together for four full days a week seems to contribute to the feeling of actually being at work. A student characterises this with the remark: “They are no longer fellow students but your colleagues.” (*Keek op de Week* 26/01/2018).

In Chapter 6 it is reported that the location also affects the development of competences and that the location at the ASZ organisation is also important for, and impacts on, learning from a learning theory perspective.

4.12 MEETINGS WITH STUDENTS

The tutors hold both one-on-one interviews and meetings with subgroups of students (progress meetings) to discuss their progress and to enable them to provide targeted coaching. These meetings did not form part of the researcher’s observations per se. However, it could be ascertained that the students remained responsible for their own contribution to the task at hand and for their contribution to the group at all times.

The effect of the meetings was that students continued to develop on a personal level. Students regularly refer to the meetings in the *Keek*. They make it clear that they need coaching from someone who is strong on the content and someone who is strong on the process. Because the precise approach taken in the coaching was not observed, reference is made at this juncture to chapter 6, in which effective coaching from a more educational angle is explained.

4.13 THE 10/10 WEEK STRUCTURE

The Innovation Lab is made up of two periods of ten weeks. In the first ten weeks the students work on innovative ideas for the ASZ. The arrangement with the ASZ is also that during the initial weeks, the hospital is paid for the facilities they provide with these ideas and the resulting prototypes. Over the course of the first ten weeks, students also come up with new ideas. These new ideas may be healthcare-related, but that is not a requirement. In the second ten weeks they focus on producing blueprints of business models for start-ups. The mission formulated by the SVR is to create start-ups (Van der Star, 2016).

The ASZ representative recently expressed his disappointment that students who had developed what he believed to be a promising prototype decided not to see it through (personal communication with Marcel Wilschut and his input in the panel discussion on 26/01/2018). This is understandable from the point of view of the ASZ, but on the other hand it should also be remembered that it is part of the deal. The prospect of a start-up is attractive to a number of students, and it is important that the start-up is about something they can lend their support to in full.

Keeping open the possibility of going in a different direction therefore seems to be a good strategy. The fact that Wilschut of the ASZ admits that he had too little time for these students (personal communication with Marcel Wilschut on 15/11/2017), along with the fact that the six students who completed the evaluation rated the degree of involvement of the ASZ representative in this cohort of Innovation Lab students as low, could have influenced their enthusiasm for continuing with their plans for the hospital.

The ASZ representative himself refers to it as a hygiene factor that must be complied with. This time he was much less able to comply with it owing to circumstances. However, it shows that the involvement of the organisation for which the students are carrying out their assignments does in fact play an essential role.

4.14 THE FIVE COMPETENCES OF LEARNING TO INNOVATE AND THE FINAL ASSESSMENTS

As stated on the website and in the documentation available on the Innovation Lab, the process of learning is focused on the five competences of Learning to Innovate. The competences are: being innovation-driven, being demand-driven, being collaborative, being able to generate new knowledge, and engaging in interactive learning. A typical description of these competences is provided in Appendix 1. The competences are listed on an assessment form with a score column (appendix 2). The students award themselves marks on a scale of 1 to 10 for each competence. In the final assessments at the end of the Innovation Lab, they do so again and must demonstrate, based on a portfolio and an assessment interview with two assessors, that they are in fact worth the mark they give themselves.

The competence profile is also a guideline for the personal development interviews which the tutors regularly hold with the students. For each competence, the portfolios contain descriptions of meaningful experiences undergone by the student during the Innovation Lab.

From the STARR descriptions⁶ and the assessment interviews it can be concluded that students are not good at producing a STARR description as provided to them (Reekers, 2017). There is still much to be gained, particularly at the level of concrete behaviour descriptions. The assessment interviews essentially reveal that students are able to talk about what they have done but find it difficult to distil *working principles* out of their actions.

A distinction is made between incident, pattern and control level in 4.10.2. An illustrative example is the story told by a student during an assessment about how he saw self-driving vehicles

⁶ STARR descriptions are descriptions written by students in order to demonstrate their competences. They describe a professionally critical situation and the task they had to perform in it. They then describe the actions they took to achieve the intended result within that task. Finally, they reflect on their actions and the results they achieved.

transporting containers at Maasvlakte. That principle led him to the idea of introducing small self-driving robots that could transport samples and medicines in the hospital, saving the nursing staff time on activities that take them away from direct patient care. He sees the incidental event but the assessors have to point out the principle to him: identifying analogies between issues and solutions. He transfers the logistics issue and the port authority's solution to the logistics aspects he has observed in the hospital care setting. The latter requires a metacognitive view. Metacognition is a skill that has to be trained (Veenman, 2015); as far as is known, this is only sporadically the case in education nowadays.

Reekers (2017) has developed a model with tools that can be used by students to design their own professional working practices. This approach was briefly discussed in the Innovation Lab but there is no evidence of the students having applied it, possibly because it was not focused on in the supervision. It formed an unplanned interlude. Perhaps this could be incorporated into the Innovation Lab approach right from the start in a future edition.

The students all passed the final assessment. They were able to mark their own performances in respect of the five competences. Depending on the portfolios handed in and the interviews, the assessors subsequently made adjustments to the marks. Interestingly, the marks awarded by the students and those given by the tutors largely coincided (see table 4). A significant correction to a higher average mark (>0.5 difference) was required in two cases and a correction to a lower mark in two other cases. Because one of the tutors had to take long-term sick leave and a replacement could not be found in time, the researcher acted as the second assessor. This gave him the opportunity to see what students wrote in their assessment dossiers and how they answered the assessors' questions.

Student	1		2		3		4		5		6		7		8	
Competences	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a
Being innovation-driven	8,5	8	9	9	7	8	8	9	8	7	7	7	8	7	6,5	8
Demand-driven	8	8	8	8	7	8	7	8	7,5	7,5	6,5	6,5	7	8	7	8
Being collaborative	8,5	8,5	8	8	9	8	7,5	7,5	7	7	7	7	8	8	7	8
Able to generate new knowledge	8,5	8	9	9	7	8	6,5	8	8,5	8	7,5	7,5	7	8	6,5	8
Engaging in interactive learning	9	8	9	9	9	8	7	7	8	7	8	7	8	7	7	9
Average	8,1	8,1	8,6	8,6	7,8	8	7,2	7,9	7,8	7,3	7,2	7	7,6	7,6	6,8	8,2

Student	9		10		11		12		13		14		15	
Competences	s	a	s	a	s	a	s	a	s	a	s	a	s	a
Being innovation-driven	7	8	8	8	6,5	6	8	7	8	8	8	9	5,5	8
Demand-driven	8	8	7	7	8	6	8	8	7	7,5	9	9	7	9
Being collaborative	9	9	8,5	7,5	8	6	8	7	6	6	7	8	6,5	8
Able to generate new knowledge	7	8	7	7	6,5	7	8	8	6	7	9	9	6,5	7,5
Engaging in interactive learning	9	8	8	8	6,5	6	9	7	7	5,5	8	9	7	7
Average	8	8,2	7,6	7,5	7,1	6,2	8,2	7,4	6,8	6,8	8,2	8,8	6,5	7,9

s= awarded by student

a= awarded by the two assessors

Table 4. Marks awarded for each competence in the final assessment

Chapter 5: The SVR Innovation Lab in the form of a learning-theoretical guide

Much has been written about learning and what exactly it is. Jarvis (2006) examined all known learning theories and produced the following definition of learning

“The combination of processes [...] whereby the whole person – body (genetic, physical and biological) and mind (knowledge, skills, attitudes, values, emotions, beliefs and senses) – experiences social situations, the perceived content of which is then transformed cognitively, emotively or practically (or through any combination) and integrated into the individual person’s biography resulting in a continually changing (or more experienced) person.”

He points out that a situation can arise in which the integration of experiences is not entirely successful. He calls this “disjuncture”, or freely translated: I can no longer automatically incorporate the experience into my biography. I have to do something to bring the experience back into harmony with myself. Bringing back into harmony is an important learning experience.

It is precisely this that produces that changed, more experienced person. Disjuncture situations such as these typically arise in these professionally critical situations. That makes them challenging, according to Matsuo (2015). It is precisely this element that is typically achieved in the Innovation Lab by leaving the assignment open. Jarvis explicitly places learning in the social situation, as can be seen in the definition. This is why it is important to place the Innovation Lab in the social context, i.e. at the organisation for which the students are carrying out their assignments. It enables the students to experience things in the actual context. In the *Keek* of 19/01/2018, every student talks about their learning experiences in the Innovation Lab. It is full of comments that reflect that change towards the more experienced person. Some examples indicate that the student concerned experienced something that made him realise that he needed to develop other skills: self-awareness, learning to ask for help, being open to other opinions, thinking before you speak, shifting from introverted to relaxed when contributing your opinion, immersing yourself in someone else, letting go of your idea, becoming more open, etc. To put it simply, learning really happens.

The programme is competence-driven. After an extensive literature review of the term, Valcke (2010) has this to say about competences: competences emerge in concrete, authentic contexts; usually a problem context, an application context, a professional context (p. 451). Without that concrete, authentic context, in this case the context of the ASZ, a competence loses its meaning. The context is needed for the development of competences. In addition to the opinions of the commissioning party, the tutors and the students on the importance of the location, this also underlines from a theoretical point of view how important it is to locate the programme at the organisation for which the students are carrying out their assignments.

The most important components of the Innovation Lab are visualised in Figure 3, “The players and the playing field”.

The players and the playfield

De path to the finish is determined by:

- De finish = (Honours) competencies (the norms)
- To be aware of your progress = Feedback and reflection
- Intermediate goals (scaffolding)

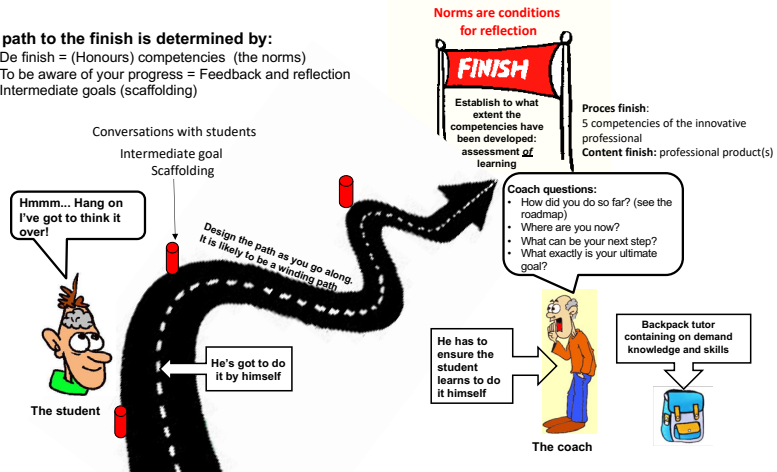


Figure 3. The players and the playing field

It is essential to follow a learning pathway that is determined by the final qualifications, as there is a clear finish. The finish consists of two parts, a content part and a process part. The content part requires products to be delivered, while the process part requires the established competences to be met. This finish is clearly defined and the tutor coaches always remind the students of it. The path towards it is not a straight, precisely predetermined route. It is the student who, as it were, has to build the path towards it as he or she progresses. The path in the diagram in Figure 4 merely indicates that there is no straight path. This diagram visualises the process which professionals with innovative ambitions go through. Building the path can be testing because unexpected situations will arise. A wonderful idea suddenly turns out to be flawed and one has to start again, and meanwhile the clock is ticking...

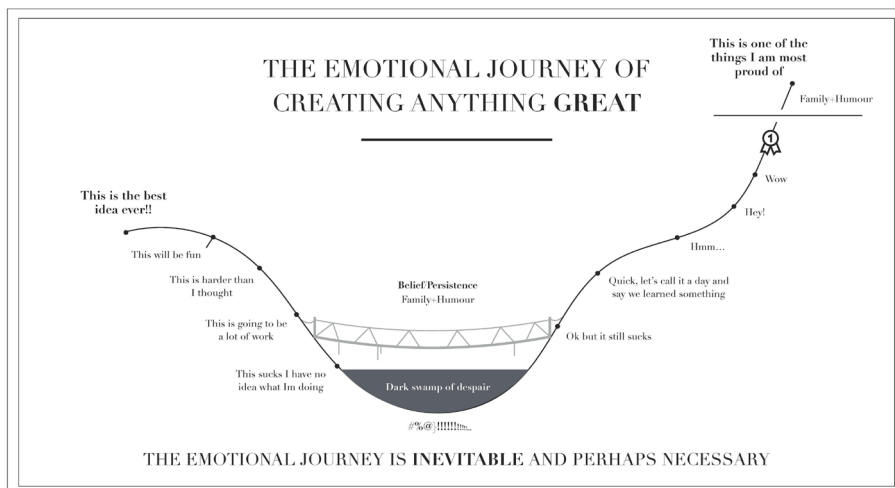


Figure 4. The Emotional Journey of Creating Anything Great (Saddington, 2016)

One student says the following about this:

"We had an idea, and we presented it to you, and you liked it too. Then we talked to a lot of people, and then we realised it was actually a bad idea. We would never have done that on my media technology course. The question 'why' is not asked. You throw yourself into it, get a 'Satisfactory' and that's fine. Now I find that I really want something that taps into the market and that I can get enthusiastic about."

From this quotation it can also be seen that what happens here in the Innovation Lab context is clearly not experienced in the educational context.

However, on that persistently unclear path, it is important that one remains confident that one will ultimately succeed. Bandura (1997) calls it "self-efficacy": the amount of confidence one has in a good outcome. In order to maintain that on this unclear path, one needs signposts, or in learning theory terms, "scaffolding" (Valcke 2010, pp. 246, 257, 274, 284, 294), that keep one informed about the extent of progress one is making on the journey towards the destination. In the Innovation Lab this is provided by way of the progress meetings and individual interviews which the tutor coaches hold with the students. In Figure 3 this is typified by the questioning attitude of the tutor coach who gets the student thinking about where he or she is along the path towards the destination. It provides feedback on where the student is now, feed-forward on what the next step might be, and feed-up on what the final destination is. Hattie and Timperley (2007) give a clear description of these "feed forms". Whether the tutors have applied the feeds in practice in exactly the same, purely methodical manner has not been established. However, it was evident that both the individual students and the group remained responsible for their journey at all times. Because of the planned progress meetings and the individual interviews that formed part of the Innovation Lab, attention was paid constantly to the development of the individual students, the subgroups and the group as a whole. The rucksack in the diagram represents the knowledge and skills which the tutor coaches contribute on demand: in the form of mandatory input in the early stages and, by necessity, on demand later on. There are situations in which the tutor coach sees that something is not going well and may be inclined to help the student(s) by providing input.

This inclination was experienced by students when they simulated the educational approach of the Innovation Lab in their final event in order to explain it to a wider audience. The students were on hand to advise and assist the participants at the event, but the participants did not ask for their help. This caused some feelings of unease among the students and they asked the tutors for advice. The tutors explained that the request actually had to come from the participants. The situation in the context should enable learners to recognise for themselves that they need help.

The coaching attitude (Reekers & Spijkerman, 2017) of the tutor coach plays an important role throughout: asking questions that make the student or student group think for themselves instead of coming up with ready-made assistance. All interventions are geared towards the students or student group learning to do things for themselves, as shown in the diagram.

Jarvis's definition of learning (2006) states that it is about how a person experiences the social experience. That process of experiencing involves an unconscious and conscious form of interpretation of the situation; a form of sensemaking. Reflection is the means for interpreting

experience in a more conscious and professional way, in order to examine the incidental experience for possible underlying patterns and rules.

In the assessment dossiers (STARR descriptions for demonstrating competence development) and the final assessment interviews, there was no clear evidence of systematic reflection in which the students demonstrate that they can see and understand what they are doing. The design of the assessment dossiers did not comply with the manual and checklist developed by Reekers (2017), which was handed out but was not taken on board. For the guide, please see the book: *Professionele identiteit. Omdat je toekomst op het spel staat!* (cf. also the references at the end of this report).

Requirements for an effective STARR description		
S	Is the situation you have chosen a professionally critical one?	<ul style="list-style-type: none"> • There was a dilemma. • It was an issue for which no standard answer was available.
T	Was the task a challenge for the person in question?	<ul style="list-style-type: none"> • The task shows clearly and in a measurable way what the person in question had to try to achieve in this situation or with this issue. • It explains exactly why it was necessary to complete this specific task.
A	Have you described your actions with respect to the challenge?	<ul style="list-style-type: none"> • It refers to actions that address the task described • It is described in terms of specifically observable behaviour
R	Have you described what the result was/results were in terms of the challenge?	<ul style="list-style-type: none"> • You have made it clear which specific effect or which specific results your own specific actions had in relation to the task you were facing • You have made it clear what your actions led to and compared your results with your aim
	Reflect	<ul style="list-style-type: none"> • You have established the extent to which you performed the task well • You have established the extent to which you did the right thing • You have made it clear which part of your actions effectively contributed to the result achieved • You have made it clear what you could improve or change to achieve a better result
	Sensemaking	<ul style="list-style-type: none"> • You have made it clear which qualities in the behaviour you have described were highlighted effectively
	Connecting	<ul style="list-style-type: none"> • You have made it clear which new qualities were highlighted in your actions and/or which qualities strengthened those already present
T	Transfer	<ul style="list-style-type: none"> • You have made it clear which aspects of a unique situation could also be used in other situations in the future and how that could be done • You have made it clear what certainly ought to be tackled differently in future situations • You have made it clear whether a pattern can be seen in your actions that can be identified in other situations and if so, which. You have indicated whether or not that was effective and if not, what you are going to do to break that pattern
	Interrelationship	<ul style="list-style-type: none"> • There is a clear interrelated line in the STARR elements

Table 5. Requirements for an effective STARR description

The *Keek op de Week* described is a good starting point for learning from and with each other in group sessions, because every student is given the opportunity to describe a high point and a low point every week. Elements that are absent are a peer supervision method such as the incident method and a reflection method which enables the students to internalise how to identify patterns and rules from incidents, and which can be transferred to other situations. See also the section on “Transfer” in table 5. This could be improved upon by also incorporating a workshop on designing one’s own actions. A model for this can be found in the appendices.

Chapter 6: Summary of the ingredients

Fourteen ingredients were identified and described. A brief description of each one follows below:

1. INTRODUCTION

What characterizes 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 4 ½ 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 characterized 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>

2. 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.

3. 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 recognizable 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 organization and hygiene factors

The partner organization stipulates the following hygiene factors:

- ▶ A contact person from the organization acting as an intermediary between the organization 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 organization.
- ▶ A partner organization in an industry in flux with the desire to promote out-of-the-box thinking in the organization.

c. **The informal position of students**

The informal position of the students in the organization allows them to easily establish informal contacts outside of what can sometimes be complicated organizational procedures. This point seems to be particularly important in organizations 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 organization's staff from an unbiased perspective. For the students, this contributes to the critical professional nature of the situation. It helps them learn how to solve vague, wicked problems.



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 organization 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 organizations, 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 organizations.

g. **Multidisciplinary**

Multidisciplinary 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 multidisciplinary 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 organization'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 organization'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 five 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, demand-driven, being collaborative, able to engage in interactive learning, and 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).

4. 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.

5. 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:

- ▶ Incorporating emphasis on formulating and reflecting on the students' ability to act professionally and on distilling transferable learning experiences.

Chapter 7: Conclusion

The Silicon Venturing Rotterdam Innovation Lab, a collaboration between RUAS and the Albert Schweitzer Hospital in Dordrecht (ASZ), has proved a success four years in a row in the eyes of all parties concerned: the ASZ, the participating students, the tutors, and the Business Innovation Knowledge Centre, the department of the University with responsibility for the Innovation Lab.

Evidence of the success of the Innovation Lab can be seen in:

- ▶ the 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 assessment of the positive outcomes of the Innovation Lab for the hospital by the hospital's representative
- ▶ the students' learning outcomes, as evidenced by the products delivered to the hospital, the descriptions by the students in their assessment dossiers, the assessment interviews and the evaluations of the interviews.

What made the Innovation Lab a success to begin with was unclear. That gave rise to this research, which addressed the question: What are the effective components that contribute to the success of the Silicon Venturing Rotterdam Innovation Lab (SVR Innovation Lab) and how can they be described in terms of active ingredients?

To answer this, the researcher looked at the ingredients that could be observed based on the available written information on the Innovation Lab and information obtained through observation and interviews. It would be going a little too far to speak of causal relationships between these ingredients and the success of the Innovation Lab, since this would require much more intensive research than was carried out this time.

It can reasonably be assumed that the same success may be expected in other future programmes if the ingredients, learning theory aspects and points for improvement described are properly incorporated.

Important and necessary requirements for tutors are: personal involvement and the ability to use coaching interventions to ensure the students retain responsibility for their own work and that of the group at all times.

References

- Aulet, B. (2013) 24 steps to a Successful Start-up. Disciplined Entrepreneurship. Indianapolis: John Wiley @ Sons.
- Bandura, A. (1997). Self-efficacy, the exercise of control. New York: Worth Publishers.
- Dijk, B. van (2015). *Beïnvloed anderen begin bij je zelf. Zaltbommel*: Thema.
- Flanagan, J. C. (1954). The Critical Incident Technique. *Psychological Bulletin*, 51(4), 327-358.
- Grotendorst, A., Rondeel, M. en Wijngaarden, P. van (2006). *Kritische beroepssituaties geven competenties context*. Utrecht: Kessel & Smits.
- Hattie, J. & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research*, 77(1), 81-112.
- Hendriksen, J. (2009). *Handboek Intervisie*. Amsterdam: Boom/Nelissen.
- Jarvis, P. (2006). Towards a Comprehensive Theory of Human Learning. Taylor & Francis Ltd.
- Jaspers, M & J. Speetjens (2007). *Competentie gestuurd leren en opleiden: Een methodische handreiking*. Eindhoven: Fontys Facilitair Bedrijf, Education department, Centre for Education Innovation and Research.
- Matsuo, M. (2015). A Framework for Facilitating Experiential Learning. *Human Resource Development Review*. 14(4) 442 – 61.
- Newton, C. & Kortenhorst, O. (2018). Factsheet Silicon Venturing Rotterdam. Rotterdam: SVR students.
- Polanyi, Michael (1966). *The Tacit Dimension*, University of Chicago Press: Chicago,
- Reekers, M. (2017). *Hoe vang je een ervaring? Stage-ervaringen vertalen in kwaliteiten – Je gaat het pas zien als je het door hebt!* Rotterdam: RUAS (internal publication)
- Reekers, M. (2017). *Professionele Identiteit. Omdat je toekomst op het spel gaat*. Rotterdam: Uitgeverij Hogeschool Rotterdam.
- Reekers, M. & Spijkerman, R. (2017). *Professionele gespreksvoering. 2nd edition*. Amsterdam: Pearson Benelux.
- Reijenga, J. (2018). *Learnings en outcomes van 4 jaar Silicon Venturing Rotterdam*. Rotterdam: RUAS (internal report)
- Saddington, J. (2016, 31 December). The Emotional Journey of Creating Anything Great [Infographic]. Consulted on 22 June 2018, at <https://i2.wp.com/john.do/wp-content/uploads/2016/12/emotional-journey-of-creating-anything-great-infographic-large.jpg>
- Star, G. van der (n.d.). Silicon Venturing Rotterdam. Rotterdam: RUAS
- Valcke, M. (2010). *Onderwijskunde als ontwerpwetenschap: Een inleiding voor ontwikkelaars van instructie en voor toekomstige leerkrachten*. Ghent: Academia Press.
- Veenman, M. (2015). *Metacognitie: "ken uzelve" in*: De Psycholoog. 's-Hertogenbosch: Netherlands Institute of Psychologists.

Publication details

© Martin Reekers

Version 3, January 2019

This is a publication of the RUAS
Business Innovation Knowledge Centre.
PO Box 25035
3001 HA Rotterdam

The copyrights of the images (figures and photographs)
reside with RUAS and the originators unless otherwise stated.

This publication is licensed under a Creative Commons
Attribution-NonCommercial-ShareAlike 4.0 International licence.

Images: Martin Reekers
Illustrations: Martin Reekers
Graphical design: RUAS Business Innovation Knowledge Centre

exceed expectations



**ROTTERDAM
UNIVERSITY**

UNIVERSITY OF
APPLIED SCIENCES