Entrepreneurship eduction through design

Exploring different design perspectives to understand and educate the business proposition development process in new high-tech ventures

van Oorschot, Robin

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ROBIN VAN OORSCHOT

ENTREPRENEURSHIP EDUCATION THROUGH DESIGN

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Dissertation

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by

Robin VAN OORSCHOT

Master of Science in Information Technology, IT Product Design
born in Eindhoven, the Netherlands

This dissertation has been approved by the promotors:

Dr. Ir. F.E.H.M. Smulders
Prof. Dr. H.J. Hultink

Composition of the doctoral committee:

Rector Magnificus,	Chairperson
Dr. Ir. F.E.H.M. Smulders,	Delft University of Technology, promotor
Prof. Dr. H.J. Hultink,	Delft University of Technology, promotor

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Prof. Ir. D.N. Nas,	Delft University of Technology, substitute member

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Robin van Oorschot - robinvanoorschot@gmail.com

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Voor mijn ouders
en hun onvoorwaardelijke steun en liefde

INDEX

Hello?
Yeah, it's me.
I wanna give you some good frequencies.
117, 2.6, 2245...
Yeah...
3032, 400
Four hundred?
Yeah.
I'm Comin' over.
Do that.
I'll be there in two seconds.

So Easy, Röyksopp, 2011

1. Introduction

I can best describe the aim of this thesis by introducing an experience I had when I was in the audience of a panel discussion at the Academy of Management (AOM) annual meeting, August 2015. At the AOM annual meeting, over 10,000 scholars from around the world get together for five days to discuss research in management, economics, innovation and entrepreneurship. The topic of the panel discussion was "the opportunity in entrepreneurship". The opportunity is a construct that entrepreneurial scholars have investigated extensively: What is this opportunity? Is an opportunity 'floating in space' to be discovered by a searching entrepreneur? Does an entrepreneur create an opportunity in collaboration with 'the world'? Does 'an opportunity' exist in the first place? These kinds of questions formed the basis of the panel discussion. Five of the most prominent opportunity-scholars were on stage to discuss this topic. Other opportunity-scholars in the audience waited for their chance to participate in the discussion. The discussion was heated. The perspectives of the scholars on stage were far apart from each other; it was clear it would be impossible to reach consensus. They argued with each other abouth the definition of opportunity that a scholar used in the 1980s, and how this definition did not match this same scholar's claim in work that he presented in the early 2010s. At some point,

several researchers actually got angry at each other in the search for 'the truth' about opportunities. There was a tense ambiance.

At the same time, there was not a single practicing entrepreneur at the venue. Nor did the scholars present any example of what different views on 'the opportunity' would actually mean. I needed concrete examples like: *"David woke up one morning with the great idea to develop a new website development software tool, even though he did not know anything about software*". Or, *"Michelle experienced that her aunt has troubles recovering from her elbow surgery and decides to develop a recovery assistant tool for patients worldwide*". Or, *"Charlie is educating ten entrepreneurial students in his university course, who are all working with an entrepreneurial opportunity. Can Charlie educate all ten students in the same way?"* I missed practical examples about what it means for entrepreneurs to be involved with an opportunity, but the scholars did not provide these. The focus of the discussion was on 'which exact wording' to use to describe the abstract phenomenon of 'the opportunity'. The exact wording is important to guarantee academic rigor, but in the panel discussion I noticed that the exact wordings became less meaningful when they are not linked to concrete examples.

I took away two learning points from this panel discussion. First, I admired the dedication of the field of entrepreneurship in search for rigor and clarification of what an entrepreneurial opportunity is. Second, I was surprised how detached from the practice of "doing" entrepreneurial activities some entrepreneurial scholars in the panel discussion became in this search.

This thesis builds on these insights. First, this thesis aims to contribute to improve the understanding of the entrepreneurial opportunity by taking a '**design perspective**'. Taking this perspective might not lead directly to more rigor, since it will open up a whole new field, which brings in its own understanding. However, throughout this thesis I

will explore how a design perspective provides new clarification in understanding the entrepreneurial opportunity. Second, this thesis uses an involved research methodology in this exploration. It is my aim as a researcher to be 'in the action'. This thesis is going to use three different qualitative methods in which I participate at different levels of involvement in the context of entrepreneurs dealing with opportunities. It is through being involved that I aim to provide clarity.

1.1 The entrepreneurial perspective

Scholars have extensively researched entrepreneurial opportunities. The research on opportunities revolves around three main questions*: "(1) why, when, and how opportunities for the creation of goods and services come into existence; (2) why, when, and how some people and not others discover and exploit these opportunities; and (3) why, when, and how different modes of action are used to exploit entrepreneurial opportunities"* (Shane & Venkataraman, 2000: 218). To answer these questions, researchers take two views on opportunities: the discovery view and the creation view (Alvarez & Barney, 2007, 2013). In the discovery view, an opportunity is described as *"lost luggage at a train station, waiting to be claimed by some unusually alert individual"* (Alvarez, Barney, & Anderson, 2013, p. 305). In the discovery view emphasis is on the 'alertness' of the entrepreneur, some entrepreneurs are better at discovering opportunities than others. In the creation view, opportunities do not exist objectively but *"are formed endogenously by the actions of those seeking to generate economic wealth themselves"* (Alvarez & Barney, 2013, p308). The emphasis in the creation view is on how actions lead to the creation of opportunities.

In continuation, entrepreneurial scholars investigate what happens during the entrepreneurial process once the opportunity is discovered or created. An opportunity is a good start, but the success of

entrepreneurship is determined by the creation and success of the new venture of the entrepreneur. There is a consensus among entrepreneurial scholars that the process of exploiting the entrepreneurial opportunity, is a creation process based on action (Shane & Venkataraman, 2000). The process of exploiting the business opportunity is referred to as 'the entrepreneurial process' or 'the new venture creation process'. Similar as in the opportunity debate, entrepreneurial scholars have discussed the new venture creation process extensively. In this debate, there are roughly two schools of thought. First, scholars representing the largest entrepreneurial research domain aim to define the entrepreneurial process as both general and distinct (Moroz & Hindle, 2012). General means that the definition holds for *all the* entrepreneurial processes. Distinct means that it defines *only* entrepreneurial processes. At the moment of writing this thesis, there is no consensus (yet) on a general and distinct entrepreneurial process. This consensus is hard to reach since the entrepreneurial process shows overlap with other processes. Therefore, the second school of thought does not strive for generality and distinctness, but is interested in both the similarities and differences between entrepreneurial processes and other processes. Scholars in this domain aim at practical implications for entrepreneurs and implications for the education of the entrepreneurial process. Researchers have, for example, investigated the similarities between innovation and entrepreneurial processes (e.g. Drucker; 2014), design and entrepreneurial processes (e.g. Mata Garciá, 2014) and entrepreneurial and economic processes (e.g. Wennekers & Thurik, 1999).

When considering both the opportunity and the new venture creation process, the term 'business proposition' (e.g. Osterwalder, Pigneur, & Tucci, 2005) is useful. The business proposition develops from the initial idea, via several concepts and prototypes, and finally to a finalized 'product' (in its widest definition) that is 'produced' (again, in its widest definition) and sold. The business proposition development process has

the actions of the entrepreneurs embedded in its definition.

In this thesis, I am specifically interested in the business proposition development of new high-tech ventures. A new high-tech venture is an independently owned company that (1) has been established less than five years ago, (2) is based on the exploitation of a technological innovation or innovative application of existing technology, and (3) is facing substantial uncertainty (Burgel & Murray, 2000; McDougall, Shane, & Oviatt, 1994; Storey & Tether, 1998).

The reason for this focus is that I conduct my research at the Delft University of Technology (TU Delft). This university has, for example, faculties of Aerospace Engineering, Civil Engineering, Computer Science, Mechanical, Maritime and Material Engineering and Electrical Engineering. At these faculties students work with high-tech 'opportunities' and several students want to develop these high-tech ideas in their own new venture. Scholars, educators and policymakers of the TU Delft have investigated since the last two decades how to best educate entrepreneurial principles to these students working on high-tech developments, so that the students can successfully develop a business proposition in their new high-tech venture. The work in this thesis contributes directly to the wish of the TU Delft to find better ways to educate students to start their new high-tech ventures.

Scholars have described some *elements* of entrepreneurship education. For example, Fiet (2001a, 2001b) argued that in entrepreneurship education, the main focus should be on educating strategy, managing growth, idea generation, risk and rationality, financing, and creativity. Fayolle (2013) illustrated a consistency in this focus in recent years and thus could be taken up by several educational programs. Section 2.6 will assess in more depth the elements in entrepreneurship education. However, since there is no scholarly consensus yet on what the business proposition development process is, there is no standard either on

how to educate this process. Consequently, the TU Delft cannot adopt academic constructs on the business proposition development process and apply them to the education of all students starting their new high-tech ventures. The aim of this thesis is to provide a better understanding on the business proposition development process, which allows educators to better educate students to start their new high-tech ventures.

This thesis takes a specific perspective on entrepreneurship education. Nielsen and Gartner (2017) differentiate between education 'about', 'for' and 'through' entrepreneurship. Education 'about' entrepreneurship focuses on learning about what entrepreneurship is, and what role it has in society and economy. Students do not necessarily engage in entrepreneurial activities themselves in this approach. Education 'for' entrepreneurship focuses on learning tools and methods that students could use for starting their new venture. These two approaches do not focus much on elements such as action, reflection or experience as essential ingredients of entrepreneurship education (Hägg & Kurczewska, 2016). Education 'through' entrepreneurship on the other hand is practice based and focuses on the students learning through being involved in developing a business proposition themselves. Learning takes place through the activities that the student entrepreneurs undertake in their own new venture. Pittaway and Edwards (2012) assessed how learning 'through' entrepreneurial activities is most fruitful for the learning of students to become an entrepreneur. Robinson, Neergaard, Tanggaard, and Krueger (2016) point out that education though entrepreneurship addresses both if and how it is possible for universities to provide good education, and at the same time give room for the students entrepreneurial becoming. The research in this thesis contributes to this discussion. This means that although this thesis focuses on entrepreneurship education and how students develop their business proposition, this thesis will not go in

depth into the elements that embody learning styles, techniques and topics that categorise under education 'about' and 'for' entrepreneurship (which is the majority of the literature on entrepreneurship education (Robinson et al., 2016). Instead, this thesis views students as active entrepreneurs (who learn simultaneously). This thesis will explore how to understand the process that (student) entrepreneurs go through while developing their business proposition.

1.2 The design perspective

There are several points of view to approach the challenges as described in the previous section. There are three reasons why this thesis takes 'a design approach'; the first reason is personal; the second reason has to do with the educational context in which this thesis was written and the third reason is a theoretical one. To start with the personal reason, it is useful for you, the reader, to know a bit more about me, the writer.

I am a designer. I am a designer by education. I have a bachelor and master degree in design. I have always been interested in 'designing'. Even though I am educated as a designer, I am not designing 'objects', nor 'services' or 'systems'. At most, I am designing 'processes' and 'relations'. Still, I am a designer and I design, and for the last decade I have been curious what this means. I am curious what it means to me, and what it means for design in general. It is with this curiosity that I engage in the academic debate on the business proposition development process and the new venture creation process. For me as an educated designer, it is interesting to experience the struggle of the '*field*' of entrepreneurship and its need to define its terms. It fascinates me to see the struggle to define the entrepreneurial process in a general and distinct way, as Moroz and Hindle (2012) propose. In the field of design, researchers have been working with non-distinct and non-general

descriptions for design and the design process for decades. The most widely accepted definition of design is *"changing an existing situation into a preferred one"* (Simon, 1963). One of my first teachers when studying industrial design liked to illustrate the over-generality of this definition by tying his shoelace and explained how he now 'designed' by changing an existing situation (the untied shoelace) into a preferred one (the tied shoelace). My teacher would argue that in respect to definition of terms and defining the borders of the field, design did not perform well. He would also argue that, even without a definition of design, design schools educate the activity of 'designing'.

Next to my personal background as a designer, educational practice has also illustrated the benefit of a design perspective. At the Faculty of Industrial Design Engineering at the TU Delft alone, scholars investigated, for example, how to work with the design process (e.g. Roozenburg & Eekels, 1995), innovation processes (e.g. Buijs, 2012) co-design (e.g. Sanders & Stappers, 2008) creativity in design processes (e.g. Dorst & Cross, 2001), product development and marketing (e.g. Hultink & Schoormans, 2004) and the designers vision in design processes (e.g. Hekkert & Van Dijk, 2011). Methodologies, methods and tools have been used for over 25 years to educate students *how* to design in the process from a first idea to a final 'product'. The field of design developed the *how* without knowing the exact *what*. In contrast, the field of entrepreneurship wants to define the *what* first, before diving into the *how*. A main reason for this choice is that the majority of the field of entrepreneurship follows the tradition of control and predictability (Pittaway, 2005), in which the *what* needs to be defined before the *how.* This tradition made fields such as risk management and economics successful and since entrepreneurship builds on these fields (Pittaway, 2005), it wants to develop in the same tradition. In this thesis, I will do research in the tradition of design, and look into the *how* instead of the *what.* The *what* will be used to provide concrete

descriptions of the entrepreneurial process. These descriptions will not be aimed at constructing a general definition of the business proposition or the development process. Instead, taking up constructs from the field of design, I am interested in *how* to better understand and educate the business proposition development process for a new high-tech venture.

From the perspective of design students, there seems to be an overlap between the activities of *designing* and *entrepreneuring*. Twenty years ago, most master graduation students at the faculty of Industrial Design Engineering at the TU Delft chose to do their final graduation project at a big, multinational company. However, over the years, more and more students started to graduate on their own new venture. In their graduation project, they developed the proposition for their new venture, and after their graduation they would often continue developing their new venture. Examples are the students who graduated on the Senz umbrella to produce and sell a new and innovative kind of umbrella, and the Night Balance, to produce and sell a device to assist in sleep therapy. Interestingly, these students had a design education and knew about the process of design, instead of having an entrepreneurship education and knowing about the business proposition development process. This raises the question if there are elements in the design process that allows design students to develop their business proposition. Is it possible to take up design constructs and use them to educate other (non-design) students about the business proposition development process?

Finally, several scholars provided insights that 'design' enriches the understanding of entrepreneurial processes. For example, Mata Garciá (2014) described the importance of design in the entrepreneurial process, while Neck and Greene (2011) describe the importance of design in entrepreneurial process education. However, there is still a need to investigate in more depth how design can contribute to the

understandings of the new venture creation process. Therefore, the aim of this thesis is to distinguish between the different views on the process of design, and how these different views enrich the understanding of the new venture creation process. These understandings can roughly be separated in two different schools of thought. First, design is described as an activity, with a focus on 'the designer', who is engaged in activities that can be categorised as design activities, often referred to as 'design thinking' or 'designerly thinking' (e.g. Johansson-Sköldberg, Woodilla, and Çetinkaya (2013)). Second, design is described as a social process, as taking place in the social process between actors (e.g. Bucciarelli, 1988). In this view, designing is not an activity that an individual does, but designing happens in the social interactions between people. This thesis investigates how these two opposing views on the design process can improve the understanding and education of the business proposition development process. The differentiation between these two views is important because students learn 'through' their entrepreneurial activities. On the one hand, designerly thinking can be understood as an activity that a (student) entrepreneur undertakes to develop a business proposition. On the other hand, designing can be understood as what takes place in the interaction between entrepreneurial students and educators. Chapter 3 will investigate the different views on the design processes in more depth to define which constructs will be used in the empirical studies of this thesis.

1.3 Aim and structure of the thesis

To conclude this introduction, the aim of this thesis is to investigate *the business proposition development process* in new high-tech venture creation processes from several '*design*' perspectives. The outcomes of this investigation deliver insights that extend the knowledge on how students learn through entrepreneurial education activities. To

investigate this, this thesis will first investigate constructs from the field of entrepreneurship and design to better understand and educate the business proposition development process. Then, both the designerly thinking and the design as a social process perspective will be used in empirical studies. Finally, this thesis is also interested in how an entrepreneurial student experiences these design activities from both perspectives while developing a business proposition. This leads to the following five research questions:

RQ1: Which entrepreneurial constructs are required to better understand and educate the business proposition development process?

RQ2: Which design constructs from both the school of 'designerly thinking' and the school of 'designer as a social process' are required to better understand the business proposition development process?

RQ3: How do entrepreneurs use designerly thinking as an embedded activity in the business proposition development process?

RQ4: How do entrepreneurial students and coaches engage in the social process of designing a business proposition?

RQ5: How do entrepreneurial students experience the business proposition development process as a design process?

RQ3, RQ4 and RQ5 will be further specified once RQ2 is answered, because the outcomes of RQ2 will provide specific research directions from the field of design. Figure 1.1 on the next page illustrates how the different chapters will address these research questions.

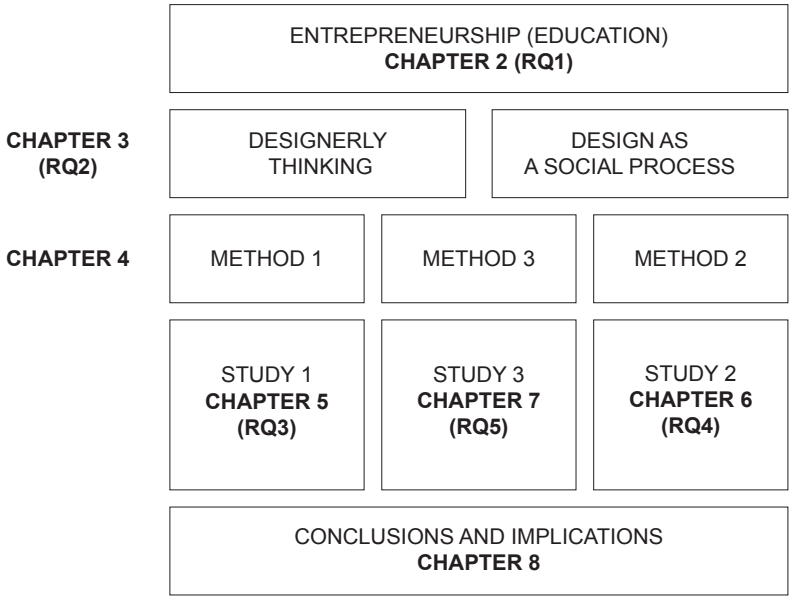


Figure 1.1: The outline of this PhD thesis, which will use two different views on the design process in three studies, using three different methods

Chapter 2, **Entrepreneurship**, builds the foundation of this thesis. It will investigate the field of entrepreneurship, the business proposition in entrepreneurship, the entrepreneurial process, and entrepreneurial education. This chapter will answer RQ1.

Chapter 3, **Designing the business proposition of a new venture,** investigates the different schools of thought in design; design as activity and design as social interaction. This chapter goes into more depth about which design constructs will be used in the empirical chapters. This chapter will answer RQ2.

Chapter 4, **Methodology,** will discuss how three different qualitative methods are needed to better understand the role of design in the business proposition development process.

Chapter 5, **Study 1: Business proposition development as Initiating, Designing, Engineering and Realizing**, investigates the role of designerly thinking in the business proposition development process by interviewing 10 new high-tech ventures. This chapter will answer RQ3.

Chapter 6, **Study 2: Quality of Entrepreneurial Design Conversation**, investigates the role of design as a social process in coaching conversations between educators and 12 student new high-tech venture teams. This chapter will answer RQ4.

Chapter 7, **Study 3: Business Proposition Development as Autoethnographic process**, describes my experience as an entrepreneurial student in developing a business proposition in a new high-tech venture during a five-week summer course. This chapter addresses both the designerly thinking approach and the design as a social process approach. This chapter will answer RQ5.

Chapter 8, **Conclusions and Implications** will summarise the conclusions of the empirical studies and integrate them to answer the research questions.

Through these research activities, this thesis will contribute to extend the knowledge on the entrepreneurial process and entrepreneurial education. By taking a design perspective, this thesis will also contribute to the understanding of design processes. The insights from the use of different design perspectives will be linked back to the field of design. Finally, by using a diversity of research methods, this thesis will contribute to the methodological understanding on doing involved research in both the fields of entrepreneurship and design. Overall this thesis will make research contributions in four areas:

The contribution to **entrepreneurial processes and activities** is mainly in chapters 2, 5 and 7 and section 8.2

The contribution to **entrepreneurship education** is mainly in section 2.6, chapters 6 and 7 and section 8.3

The contribution to **design processes and activities** is mainly in chapter 3, 5 and 6 and section 8.4

The contribution to **research methodology** is mainly in chapter 4, sections 5.2 and 6.2, chapter 7 and section 8.5

The overview in Figure 1.1 and the expected contribute described above illustrate the explorative nature of this thesis. I will use constructs from different schools of thought and use different research perspectives in this exploration. Therefore, the next chapter will first describe the solid foundation from the field of entrepreneurship and entrepreneurship education. It is based on this foundation, that the 'design exploration' will take place.

Help, I'm steppin' into the twilight zone
Place is a madhouse, feels like being cold
My beacon's been moved under moon and star
Where am I to go now that I've gone too far?

Twilight zone, Golden Earring, 1982

2. Entrepreneurship

The discussion in chapter 1 introduced the challenges of entrepreneurial research to become a distinct academic field on the one hand, and be practical for entrepreneurs on the other hand. With the aim to provide a deeper understanding of the business proposition development process, this chapter reviews the entrepreneurship and entrepreneurship education literatures to explore research question 1 in the context of this thesis:

RQ1: Which entrepreneurial constructs are required to better understand and educate the business proposition development process?

This chapter's review of the entrepreneurship literature breaks down the "understand" part of the research question into two distinct elements. Knowledge can first be divided into scientific and practical knowledge (Van de Ven & Johnson, 2006). *"The purpose of practical knowledge is knowing how to deal with the specific situations encountered in a particular case. The purpose of scientific and scholarly knowledge is knowing how to see specific situations as instances of a more general case that can be used to explain how what is done works or can be understood"* (Van de Ven & Johnson, 2006, p. 804). As chapter 1 described, there is scholarly work that investigates the general construct of entrepreneurship, and scholarly work that focuses on the question of how entrepreneurs can act when faced with a specific situation in their new venture creation process.

To asess the "educate" part of the research question, this chapter builds on Usher and Bryant (2014). They introduce the 'captive triangle' of theory, practice and research to better understand education. They describe the importance that they are themselves practitioners within, and theorists and researchers of, education, which is in line with the participatory approach of this thesis. Usher and Bryant propose that, to educate well, educational research should have elements of both theoretical knowledge and practical knowledge, and should develop insights through educational research activities. Theoretical knowledge is compatible with what Van de Ven and Johnson (2006) describe as scientific or scholarly knowledge. This thesis follows the reasoning of Usher and Bryant. The review of the entrepreneurship literature will distinguish between scientific knowledge and practical knowledge, and will be discussed in sections 2.1 till 2.4. Section 2.5 discusses the research activities specifically focused on entrepreneurial education.

2.1 Entrepreneurship as a general construct

Research on entrepreneurship has become a topic of scholarly interest in the last four decades (Shane, 2012) but the scientific construct of entrepreneurship already finds its roots almost 250 years ago. Richard Cantillon was the first to take notion of entrepreneurship in 1775 and assigned great importance to entrepreneurship and taking risk, or '**risk-bearing**' as he called it. Knight (1921) further developed the understanding of entrepreneurship and referred to **uncertainty** rather than risk. *"In [risk], the distribution of the outcome in a group of instances is known (either through calculation a priori or from statistics of past experience), while in the case of uncertainty this is not true, the reason being in general that it is impossible to form a group of instances, because the situation dealt with is in a high degree unique"* (Knight, 1921). New high-tech ventures face this uncertainty as they work with technologies

that are not introduced to the market before (Burgel & Murray, 2000).

Schumpeter (1934) builds on the idea of uncertainty but added the **innovation** aspect in the work of entrepreneurs. In Schumpeter's view, entrepreneurs are 'innovators' and through 'creative destruction' ("the new will replace the old") shape a new economy. Schumpeter's notion of innovation as dealing with uncertainty is important to better understand the role of new high-tech ventures in the economic system, since these ventures constantly deal with uncertainty (Burgel & Murray, 2000). Kirzner (1973) introduced how entrepreneurship 'happens' through the discovery of **combinations of opportunities and markets**. By separating the notions of opportunity and market, scholars could be more precise on how entrepreneurs were operating in different contexts. Researchers in the Kirznerian tradition described how entrepreneurs handled opportunities in different ways than established companies do.

In research in the 1970s and 1980s, the focus was on the **personality traits of the entrepreneur**, with the aim to describe the character traits that entrepreneurs share. Eventually, Gartner (1988) suggested that "who is the entrepreneur?" is not the main question to provide a deeper understanding on the phenomenon of entrepreneurship. The research on personal traits did not provide definite answers on how entrepreneurs are different from non-entrepreneurs. Therefore, Gartner suggested to research in depth what entrepreneurs do, and how 'the entrepreneurial doing' is different from the 'non-entrepreneurial doing'. In continuation, McMillan and Chavis (1986) introduced the term 'entrepreneuring' to make a difference between the static notion of entrepreneurship and the action of doing entrepreneurship. Since the last two decades, the **entrepreneurial process** became the most important topic of analysis in entrepreneurship research (Moroz & Hindle, 2012; Shane & Venkataraman, 2000).

Keskin (2015) builds on Deakins and Freel (2003) to describe how the developments in entrepreneurship research can be categorized into three different approaches. First, the early discussion on **the function** of entrepreneurship in society can be categorized under the economic approach. Second, the discussion on the entrepreneurial traits of **the entrepreneur** can be categorized under the psychological approach. Finally, the discussion on the entrepreneurial process or '**entrepreneuring'** can be categorized under the socio-behavioural approach (Figure 2.1).

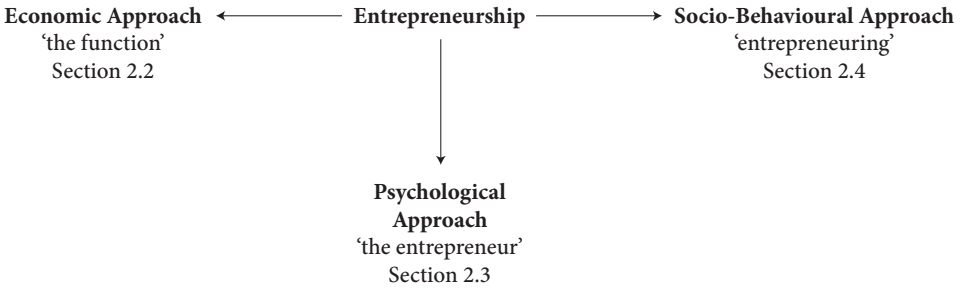


Figure 2.1: Dominant approaches in entrepreneurship research and their main focus (adapted from Keskin (2015) and Deakins and Freel (2003))

The followings sections will discuss these three views, and the implications of each view for the work in this thesis.

A practical example

Giovanni Giorgio Moroder used technology to create a new kind of music. He is seen as the pioneer of 'disco music' and 'electronic dance music'. In 2013, he composed a song together with the French electronic music duo Daft Punk. In the song, named *Giorgio by Moroder*, he reflects on his career. Textbox 2.1 contains the lyrics of that song.

When I was fifteen, sixteen when I really started to play the guitar
I definitely wanted to become a musician
It was almost impossible because the dream was so big
that I didn't see any chance because I was living in a little town, I was studying.
And when I finally broke away from school and became a musician
I thought "well now I may have a bit of a chance"
Because all I ever wanted to do is music, but not only play music
But compose music.

At that time, in Germany, in 1969-70, they had already discotheques
So I would take my car and go to a discotheque and sing maybe 30 minutes
I think I had about 7-8 songs. I would partially sleep in the car
Because I didn't want to drive home and that helped me for about almost 2 years to survive.
In the beginning, I wanted to do an album with the sound of the 50s,
The sound of the 60s, of the 70s and then have a sound of the future.
And I said: "Wait a second?
I know the synthesizer, why don't I use the synthesizer
Which is the sound of the future."
And I didn't have any idea what to do but I knew I needed a click
So we put a click on the 24 track which was then synched to the moog modular.
I knew that it could be a sound of the future
But I didn't realize how much impact it would be.

My name is Giovanni Giorgio, but everybody calls me Giorgio.

Once you free your mind about a concept of harmony and of music being correct,
You can do whatever you want.
So nobody told me what to do, and there was no preconception of what to do.

Textbox 2.1: Lyrics of the Daft Punk song *Giorgio by Moroder*

The text in textbox 2.1 reflects how Moroder used new technologies to create a new kind of music. Music is not clearly a product, music might be defined as a 'service' instead. One could claim that the creation of electronic music is a form of art, and perhaps not a 'business'. Still, Moroder's technological 'business proposition' was picked up by thousands of others (*But I didn't realize how much impact it would be)*,

and new opportunities and markets were connected. Moroder's text will be used throughout this chapter to illustrate business proposition and entrepreneurship elements. The reason to use this example is because Moroder's work on his 'business proposition', opens up the understanding of what a business proposition might be in its broadest and also artistic and designerly meaning. This thesis will explore designerly views on entrepreneurship, therefore, it is useful to understand 'the business proposition' in a more 'fluffy' sense than just in its economic definition. Furthermore, in Modorer's reflections there are numerous notions of entrepreneurial constructs that will be referred to throughout this chapter.

2.2 Economic Approach: The Function

Economic scholars made the first contribution to describe the function of entrepreneurship and entrepreneurs in the economic system. The Schumpeterian view (Schumpeter, 1934) of "creative destruction" is still relevant to understand the function of entrepreneurship in the economic system these days. New technological ventures (e.g., Uber and Airbnb) create new markets and destroy old economical markets (e.g., the taxi and hotel market) by their entrepreneurial activity.

Early scholars already mention 'the field of entrepreneurship', but in more recent literature it is debated if there is a distinct field of entrepreneurship (Shane & Venkataraman, 2000; Venkataraman, 1997). Venkataraman (1997) proposes that the field of entrepreneurship deals with *scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited* (Venkataraman, 1997). Shane and Venkataraman (2000) add that *"the field involves the study of sources of opportunities; the processes of discovery evaluation, and exploitation of opportunities; and the set of* individuals *who discover, evaluate, and exploit them" (Shane &*

Venkataraman, 2000, p. 218). In the last decade, scholars have debated this definition of the academic field of entrepreneurship. Shane (2012) reflects on Shane and Venkataraman (2000) in which they called for 'the promise of entrepreneurship as a field' and points out that '*first, no one has yet identified the unique assumptions and theories of entrepreneurship. […] Second, I cannot see what those unique assumptions and theories would be if the phenomena explained and predicted by entrepreneurship were explained and predicted by other fields*' (Shane, 2012, p. 12). Scholars have addressed the elements of entrepreneurship, but do not agree on unique assumptions and theories of entrepreneurship. As described in chapter 1, it is not surprising that the unique assumptions and theories cannot be identified, because entrepreneurship overlaps with fields like management, design and innovation.

The lack of uniqueness can partly be explained by analysing in which way entrepreneurship research is conducted. Kuratko (2005) summarized the sources of information to generate knowledge on entrepreneurship. His summary illustrates the problematic nature of entrepreneurial scientific knowledge as a distinct field of knowledge. For example, Kuratko (2005) shows that highest ranked journals describing entrepreneurship are *Journal of Small Business Management, Entrepreneurship Theory and Practice, Journal of Business and Entrepreneurship, Journal of Business Venturing, Strategic Management Journal, Journal of Small Business Strategy* and *Academy of Management Review* (Kuratko, 2005, p. 579). Especially the *Strategic Management Journal* and the *Academy of Management Review* are not dedicated entrepreneurship journals but still published an extensive number of entrepreneurial articles over the last two decades. The two articles (Shane, 2012; Shane & Venkataraman, 2000) that have been cited most in their attempt to define the academic field on entrepreneurship, were published in *Academy of Management Review*, which illustrates the overlap between management and entrepreneurship research.

Furthermore, Kuratko (2005) explained that the top academic conferences and their proceedings on entrepreneurial research are also not fully dedicated to entrepreneurship alone. Examples of entrepreneurial conferences include the *Academy of Management Annual Meeting, International Council for Small Business, Babson College Annual Entrepreneurship Research Conference* and *the European Conference on Innovation and Entrepreneurship.* Also with regard to academic conferences, the overlap between the scholarly interest in entrepreneurship, innovation and management is evident. Overall, the creation of scientific knowledge on the function of entrepreneurship does not take place in a distinct field of entrepreneurship, but is spread out over several scientific fields. This is not a surprising development, since entrepreneurship is still an emerging field. It does mean, however, that there is a clear opportunity to explore the emergence of the field from a design angle specifically with the aim to clarify the boundaries of the field.

In the economy of everyday life, the distinct notion of entrepreneurship is more visible. Entrepreneurship creates innovative products and services, new jobs, and economic growth (OECD, 2010). Entrepreneurship is responsible for a vast number of breakthrough innovations during the twentieth century (Baumol, 2005). And in developing countries, high impact entrepreneurship is the main driver of the economy (Acs, 2008). In this perspective, the Schumpeterian notion of uncertainty is still relevant. Entrepreneurs may be better in dealing with uncertainty than large and established companies may. Entrepreneurs do what bigger companies do not dare to (or cannot) do, and thus drive the market forward.

Moroder describes in his song: *I knew that it could be a sound of the future, but I didn't realize how much impact it would be.* This is an example of a single individual who is facing an opportunity, does not

know what the outcome will be, but dares to take action and eventually changes the whole market by the introduction of electronic music. The economic market needs people like Moroder to be able to change. As Kirzner (1997) describes, the role of entrepreneurs (see section 2.3) is to discover pre-existing opportunities (see section 2.4) and through these activities, entrepreneurship is moving the economic market to a state of equilibrium.

The function of entrepreneurship is relevant in respect to the role of entrepreneurs within the global market system. In universities, technological innovations are created, and through entrepreneurship, these innovations can be introduced to the economic market, possibly faster than when these university based innovations would reach the market by large companies. Entrepreneurship found its way to universities all around the world (Oxford, 2013), and university students start to become familiar with the possibility of acting as entrepreneurs in the economic market (Katz, 2003).

Conclusion of the economic perspective

Scientific – There may be a unique field and science of entrepreneurship, but till today scholars have not been able to describe specific characteristics to distinguish entrepreneurship from fields such as strategic management, product development, design and innovation.

Practical – Entrepreneurship causes creative destruction, allowing the economic market to develop itself. Entrepreneurship as an economic approach seems to handle situations of uncertainty better than large companies do.

2.3 Psychological Approach: The Entrepreneur

To better understand the function of entrepreneurship in the economic market, scholars started to investigate which people engage in entrepreneurial activities (Eckhardt & Shane, 2003). The Moroder case is a good example of how scholars used to study entrepreneurs. From his description: *And I said: "Wait a second? I know the synthesizer, why don't I use the synthesizer, which is the sound of the future."* One could get the idea that the entrepreneur is a different kind of person, different from other people, who has something that non-entrepreneurs do not have. Moroder has a ground-breaking insight (knowing the synthesizer), that allows him to take up the role of entrepreneur in the new economic market. However, scholars have not been able (yet) to show that entrepreneurs have special traits. There are as many differences among entrepreneurs as there are between entrepreneurs and non-entrepreneurs (Gartner, 1985). To describe *the* entrepreneur is impossible. Scholars described traits that seem to benefit entrepreneurs, but are not exclusive to entrepreneurs. McClelland (1967) pointed out 'the need for achievement' as an important trait for entrepreneurs. In the 1970s and 80s, entrepreneurial scholars investigated the personal characteristics of entrepreneurs and this resulted, for example, in higher rankings on traits like competitiveness (Hornaday & Aboud, 1971), need for power (Winter, 1973) and tolerance to ambiguity (Sexton & Bowman, 1985).

Zhao and Seibert (2006) linked the 'Big Five Personality Dimensions' (Conscientiousness, Openness to Experience, Neuroticism, Agreeableness and Extraversion) (Costa & MacCrae, 1992; Digman, 1990) to the entrepreneurial status. Their results *indicate significant differences between entrepreneurs and managers on four personality dimensions such that entrepreneurs scored higher on Conscientiousness and Openness to Experience and lower on Neuroticism and Agreeableness.*

No difference was found for Extraversion (Zhao & Seibert, 2006, p. 259).

Gürol and Atsan (2006) used these findings of Zhao and Seibert (2006) and applied them to the educational context to investigate entrepreneurial students in the Turkish education system. They describe that *"students are found to have higher risk taking propensity, internal locus of control, higher need for achievement and higher innovativeness"* (Gürol & Atsan, 2006, p. 25) than students who do not take entrepreneurial classes. Pihie and Akmaliah (2009) conducted a similar study among students in several countries (such as Malaysia and Indonesia) and pointed out that entrepreneurial intention is already high for those students who take entrepreneurship classes. It is, however, the task of the university to educate the *"self-efficacy in the aspects of management, financial and marketing competencies as a basis to choose entrepreneurship as a career choice"* (Pihie & Akmaliah, 2009, p. 338).

This thesis accepts the idea that there are 'super entrepreneurs' that have most of the entrepreneurial traits, like Steve Jobs and Richard Branson. They are the 'born entrepreneurs'; these people have most of traits beneficial for entrepreneurship and will start their venture, no matter if they get an entrepreneurial education or not. There are also non-entrepreneurs, people who lack most entrepreneurial traits and will most likely never become an entrepreneur. They simply lack the necessary entrepreneurial traits and interests. In between, there is the largest group consisting of a mix of entrepreneurs and non-entrepreneurs who have some entrepreneurial traits. These are the people who may become an entrepreneur. It is for these people that it is helpful to learn about the processes of entrepreneurship as Pihie and Akmaliah (2009) suggest. The psychological trait approach is critiqued for not offering answers to the act of entrepreneuring (Deakins & Freel, 1998). Entrepreneurs who only have a few entrepreneurial traits may still engage in the act of entrepreneurship, and create a new venture.

Conclusion of the psychological perspective

Scientific – There are as many differences among entrepreneurs as there are between entrepreneurs and non-entrepreneurs

Practical – There are super entrepreneurs who possess most entrepreneurial traits, but the majority of entrepreneurs have *some* traits that are favourable for entrepreneurship. Still, these entrepreneurs are starting and running new ventures, so it is useful to look at what they actually do in their daily practice.

2.4 Social-Behavioural Approach

Chapter 1 described that there are two ways to understand the entrepreneurial opportunity: the discovery and the creation view. Shane (2003) provides an overview to compare both views (Table 2.1). The differentiation comes down to two opposing philosophical world views. Do opportunities exist independent from the entrepreneur, or not? On a higher philosophical abstract level the question is; does the world exist independent from humans, or is the world shaped through human action? Table 2.1 summarizes the two views.

Discovery View	**Creation View**
Kirznerian Opportunities	Schumpeterian Opportunities
Opportunities are rare	Opportunities are common
Opportunities exist independent from the entrepreneur	Opportunities do not exist independent from the entrepreneur
Does not require new information	Requires new information
Less innovative	Very innovative
Risky	Uncertain

Table 2.1: The differences between the discovery view and the creation view on opportunities (adapted from Shane (2003))

The scientific discussion about the opportunity recently faced a re-conceptualization (Davidsson, 2015) with the aim to integrate the discovery and creation views into one overarching view in which opportunities can be categorized within different contexts, mentioning the difference between '*actor and the entity acted upon; between external conditions and subjective perceptions, and between the contents and the favourability of the entity acted upon.*' (Davidsson, 2015, p. 674). However, this re-conceptualization has been critiqued to be unrealistic (Ramoglou & Tsang, 2016) because the terminology of the discussion lost connection with what happens in the everyday life of the entrepreneur. Since there is much disagreement on the scientific definition of the term opportunity, Foss and Klein (2017) proposed to simply drop the opportunity construct altogether. However, the differentiation in table 2.1 by Shane helps to realize there are different views on how to understand the 'development of opportunities' on its most fundamental level in the generation of scientific knowledge. For this thesis, it is relevant to know which view is most useful for entrepreneurship education. In that light, the work of Garbuio, Dong, Lin, Tschang, and Lovallo (2017) is useful. They describe that "*the longstanding debate over whether opportunities are discovered or created has been resolved, in practice rather than theory, by budding entrepreneurs' preference for methods that are compatible with creation rather than discovery*" *(Garbuio et al., 2017).* Dimov (2007) explains: "*It is not about the idea per se; rather, it is about finding out whether the idea can really deliver its original promise. But then, how far should my idea stretch in order to be considered entrepreneurial, i.e., an opportunity? How can eventual commercial viability - and who is to make this judgment? - have a bearing on whether what I am thinking about here and now, before I have done anything about it or as I am taking the very first toward pursuing it, be considered an opportunity?"* (Dimov, 2007, p. 718). With the '*delivery of its original promise*', Dimov means that

the original promise of the idea is not relevant in itself, it is only in the process of delivering, through actions of the entrepreneur(s), that the original promise becomes valuable or not. Dimov's description matches the notion of Garbuio et al. (2017) of the preference for the creation-view-supporting methods. Entrepreneurs mostly care about the process of delivering the promise. As Moroder described*: I wanted to do an album with the sound of the 50s, the sound of the 60s, of the 70s and then have a sound of the future.* The opportunity of using the synthesizer was only valid because it could in the end deliver on creating the 'sound of the future', which was driving the development in the music industry forward.

Dimov (2007) proposed to define an opportunity '*as a creative product in entrepreneurship, [including] the progress (idea + action) along a continuum ranging from an initial insight to a fully shaped idea about starting and operating a business*' (Dimov, 2007, p. 720). This definition for the opportunity will be used throughout this thesis, and will be relevant in the empirical part of the thesis because it is important to put emphasis on the addition of Dimov of *"operating a business"*. This addition ensures that the opportunity is taking further than just the 'creation' of the opportunity itself. Dimov recognized that an opportunity changes in the process of fully shaping the idea and starting the business. In Moroder's example, he explains "*I didn't have any idea what to do but I knew I needed a click; So, we put a click on the 24 track which was then synched to the moog modular.*" Moroder starts with the undefined opportunity to use a 'click', and without knowing exactly what to do, Moroder (together with others, since he talks about 'we') decided to start to work with a moog modular. In practice, synching the 24-track to the moog modular has been a process of trial and error in which the idea of 'a click' was shaped through action. The Moroder example illustrates that the definition of Dimov is useful, not only in theory, but also in practice.

Dimov proposes to understand the opportunity as something that plays a role in and changes throughout the new venture creation process. Therefore, the next section will look deeper into this process.

The process view on new venture creation

Moroz and Hindle describe that "*in the simplest of terms, process theory is founded upon a worldview that conceptualizes processes, rather than objects, as the basic building blocks of how we understand the world around us*" (Moroz and Hindle, 2012, p. 8). In the light of process theory, the new venture creation process is defined as *"all the functions, activities, and actions associated with perceiving opportunities and creating organizations to pursue them*" (Bygrave, 2002, p. 7). Especially since the 1980s, the process view gained scholarly attention. To reach a consensus on what the new venture creation process looks like, Moroz and Hindle (2012) investigated 32 scholarly works, answering the question "*Are there any common denominators within the diversity of entrepreneurship literature that may serve as foundations for understanding the entrepreneurial process in a* systematic *and comprehensive way that is useful to both scholars and practitioners?*" (Moroz & Hindle, 2012, p. 1). From the 32 scholarly works, they selected four models that best describe the new venture creation process in both a distinct and general way. Distinct means that it defines *only* entrepreneurial processes. General means that the definition holds for *all the* entrepreneurial processes. The four models are discussed below with the aim to address what each model contributes to the understanding on what the new venture creation process is about.

The Emergence Model

Gartner (1985) proposed a static framework of new venture emergence and takes a phenomenological approach to link several

aspects of the new venture creation process that enable the description of differences between entrepreneurs and their processes (Figure 2.2)

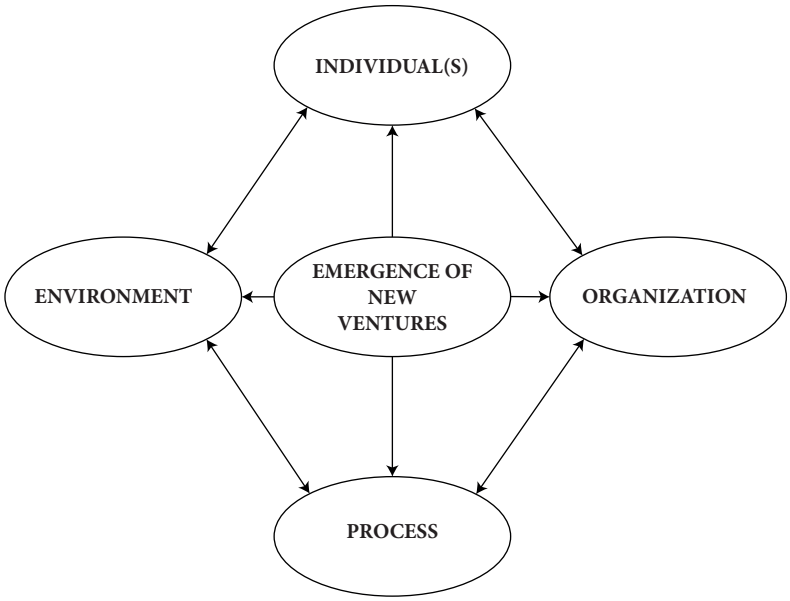


Figure 2.2: Gartner's (1985) static framework of the new venture creation process

Gartner's analysis is useful for differentiating between entrepreneurs and the organizations they create (instead of focusing on the differences between entrepreneurs and non-entrepreneurs). In terms of processes, Gartner explains that entrepreneurs (1) locate business opportunities, (2) accumulate resources, (3) market products and services, (4) produce products, (5) build organizations, and (6) respond to government and society. Moroz and Hindle (2012) describe that these six points are not exclusive for entrepreneurship or entrepreneurs. Gartner's model is still useful as it positions the '(emergence of) the new venture' at the centre of influencing elements. Especially the link to 'environment' is relevant here. As Moroder described in the example: *"At that time, in Germany, in 1969-70, they had already discotheques"*. For the new venture creation process to kick off, some environmental factors have to be in place

already. In Moroder's example, there was already some kind of market in which his new disco music could land.

Gartner's model is also useful because of its simplicity and explanatory power to explain the elements in the new venture creation process (Moroz & Hindle, 2012). However, it lacks explanation of the whole new venture creation process. Every day, new ventures emerge, but also stop (for whatever reason) before they reach a state of full exploitation of the business. Furthermore, Moroz and Hindle (2012) stress that Gartner's model is too much focused on profit-oriented goals. Many new ventures engage in social or sustainable entrepreneurship with less focus on personal or stakeholder wealth (Austin, Stevenson, & Wei-Skillern, 2006).

The New Value Creation Model

Bruyat and Julien (2001) describe a model of the entrepreneurial process and take a social constructionist approach by taking a stand on how value is created in the new venture through the risk-taking abilities of the entrepreneur (Figure 2.3).

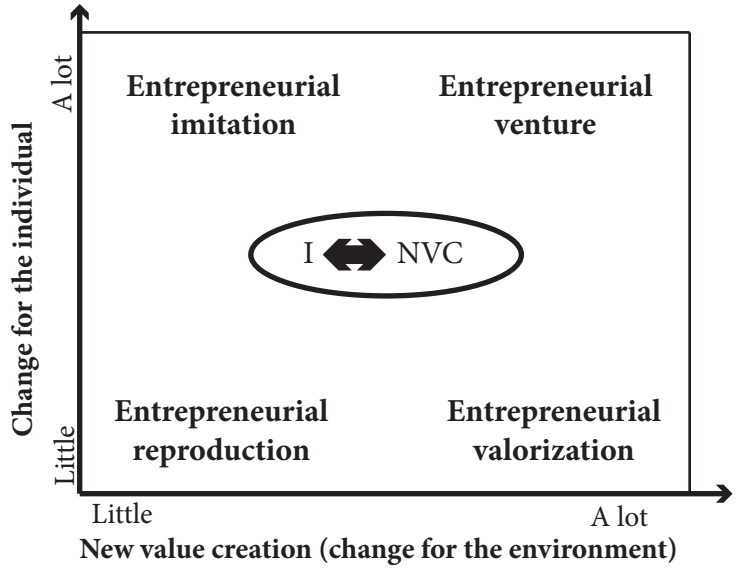


Figure 2.3: Bruyat and Julien's (2001) new value creation model

The notion of Bruyat and Julien is useful, because they put emphasis on the change for the individual. In order to be a true entrepreneurial venture, both the entrepreneur and the abstract idea of the new venture go through a process of change. Their model distinguishes itself from a strategic management models (and also Gartner's model) where the process of change is focused on the new venture. By assigning importance to the process of change of the individual, the process becomes more distinct. However, Moroz and Hindle (2012) point out that this model fails to answer the question" how do entrepreneurs create new value?. Moroz and Hindle use the wording that Bruyat and Julien *focus upon "the black box," but not to look into or attempt to explain the black box itself (2012, p. 23).* Bruyat and Julien succeeded in distinguishing *that* the new venture creation process is different from other creation processes, but say little about *how* it is different in the actual activities and processes. Therefore, their work is useful to argue scientifically that new venture creation deserves specific scientific research, but does not guide entrepreneurs much into how to develop their new venture.

The Opportunity Drive New Means-Ends Framework

Shane (2003) describes a model of the entrepreneurial process and takes a teleological approach and describes how the opportunity in the first place drives the new venture to develop (Figure 2.4).

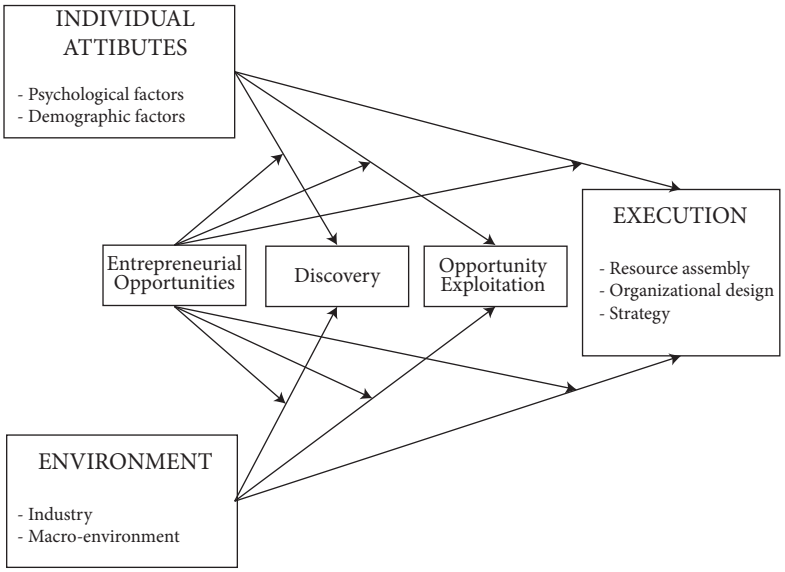


Figure 2.4: Shane's (2003) opportunity drive new means-ends framework

Shane's model is useful because it assesses both the new venture and the entrepreneur within this new venture. The model describes how several internal and external elements influence the process of discovery and exploiting opportunities.

The shortcoming of Shane's model is that the process element seems to finish at the moment that the opportunity exploration is over. Ultimately, the opportunity could be handed over (or sold) to a manager to successfully execute it. The execution part of the model is simplified to one building block. But especially when following Dimov's definition of the opportunity, there is still much entrepreneurial activity in executing the opportunity.

The Effectuation Model

Finally, Sarasvathy (2009) proposes a dynamic model of Effectuation and takes a pragmatic approach by describing effectuation and how the approach taken by an entrepreneur leads to new goals in the context of the new venture (Figure 2.5).

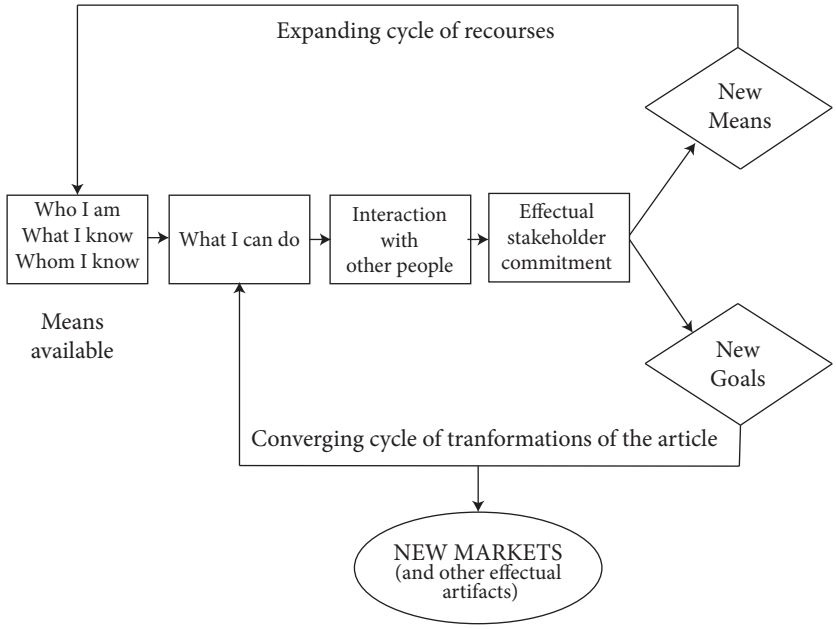


Figure 2.5: Sarasvathy's (2009) Effectuation model

Sarasvathy's model is the most recent model and also signifies a new way of thinking about entrepreneurship in general, and the new venture creation process in particular. The biggest difference between her approach and the other approaches is that it starts with the means of the entrepreneurs instead of goals from the beginning on.

Sarasvathy is explicit that 'the interaction with other people' is important in the new venture creation process, and is therefore the first of the four models to address the 'social elements' of the process. In Moroder's example, he talks about "*So I would take my car and go*

to a discotheque and sing maybe 30 minutes" and "*we put a click on the 24 track which was then synched to the moog modular".* Throughout Moroder's process there is effectual stakeholder commitment; the owner of the discotheque allows Moroder to try out his first 30 minutes of material and friends and colleagues help him to explore the technology.

Moroz and Hindle (2012) critique Sarasvathy's model on ontological and philosophical reasoning aspects, pointing out the lack of embeddedness in the ontological entrepreneurial discussion. They describe how Sarasvathy's work does not build on the work of other entrepreneurial researchers and therefore does not develop the field in a rigorous way. These arguments are partly an admission of weakness since Sarasvathy provides a new view of the new venture creation process, which offers direct implications for entrepreneurs. Attacking the model on its ontological grounding places the growth of the entrepreneurial academic field above deeding the understanding for practicing entrepreneurs. According to Moroz and Hindle (2012), only Sarasvathy's model has direct implications for practice. By following her Effectuation process, entrepreneurs may engage in better new venture creation processes. The other three models help to develop the scientific understanding on how the new venture creation process is distinct.

The aim of this thesis is to focus on the direct implications for entrepreneurs. The three other process models (excluding Sarasvathy's model) describe the attributes of new venture creation, and how these attributes influence each other in the entrepreneurial process. These models describe the process of new venture creation, but are not process models themselves. The models of Gartner, Bruyat and Julien and Shane offer a scientific understanding of the process of new venture creation, but they are not helpful to understand what an entrepreneur does (or should do) at a given moment in the development process of the business proposition. Entrepreneurs engage in several activities

simultaneously. The daily life within new ventures is dynamic and involve only one or a couple of entrepreneurs. These entrepreneurs engage in many interrelated activities focusing on the development of the various attributes of their new venture. Due to the progress made and insights gained while developing these attributes, the entrepreneurial actors adapt their activities and change the topics to work on. However, new venture creation models lack the option to take the temporal and dynamic aspects into account.

Considering that Moroz and Hindle (2012) analysed the models with the aim to provide a better understanding both for researchers and practitioners, it can be concluded that their implications are mostly for researchers. Since it is the aim of this thesis is to provide an understanding on the development of the business proposition that is useful for entrepreneurial students, more exploration into process models with practical implications is needed.

Models based on practice

Based on experiences that entrepreneurs gained by going through the new venture creation process themselves, two main authors proposed models to describe the new venture creation process. These models are favoured by entrepreneurs working on their daily business because of their hands-on approach. Furthermore, these models address the temporal aspects of new venture creation. Since these models are based on the experiences of entrepreneurs, they do not have the rigor of the academic research approaches of the models discussed before.

Ries (2011) introduces the Lean Start-up methodology and proposes a circular process model in which entrepreneurs build, measure and learn what Ries calls a Minimal Viable Product (MVP). An MVP is 'a product' (in its widest definition) with just enough features to satisfy

early customers, and to provide feedback for future development. This process is not exclusive to new venture creation process, but focuses on the aspect that especially entrepreneurs are able to quickly build their new MVP and then learn from it. Ries describes this as experimental and iterative learning, by steps of build, measure and learn in a continuous way. By learning about the business proposition, entrepreneurs can make a 'pivot', meaning that the entrepreneurs change the business proposition they are working on, and thus not have to stick with their original idea. Garbuio et al. (2017) mention that Ries implicitly describes a design process, by using 'design thinking' tools and processes, although Ries shies away from explicitly making this link.

Blank (2012) introduces "Customer Development", which is also based on the idea of pivoting; failing early and learning from mistakes. The main different is that Ries (2011) describes a circular process in which entrepreneurs constantly build, measure and learn. Blank (2012) mentions different stages which he names customers discovery, customer validation, customer creation and company building. 'Pivoting' takes places by going back and forward between customer discovery and customer validation with different kind of business propositions. Once the right customer is validated, entrepreneurs can focus on customer creation and company building.

The models of Ries (2011) and Blank (2012) have in common that they both focus on early customer engagement. They both argue that it essential for entrepreneurs to engage with customers early on and based on customer's feedback, make changes on the business proposition. From a scientific perspective, it is easy to argue that early customer engagement is not exclusive to the entrepreneurial process; also in design, innovation and product development processes early customer engagement is preferable. Ries (2011) would, however, argue that it is easier for entrepreneurs to engage in early conversation with customers,

since entrepreneurs do not work in complex large organisation which can make it difficult to engage with customers early on.

Conclusion of the Socio-Behavioural Perspective

Scientific – Entrepreneurship is best understood through the activity of 'entrepreneuring'. How this process of entrepreneuring looks like, is still not rigorously defined, since it is difficult to distinguish on which points and how the entrepreneurial process is different from other kind of 'innovation' processes.

Practical – Entrepreneurs seem to favour and follow creational processes in which they constantly iterate make changes on their business proposition with feedback from customers

2.5 Concluding the Economic, Psychological and Socio-Behavioural Approach

Building on the Economic, Psychological and Socio Behavioural perspective (Deakins & Freel, 2003), Table 2.2 summarizes the scientific and practical findings of the literature review on entrepreneurship, and the new venture creation process specific.

	Scientific Implications	**Practical Implications**
Economic approach	It is not certain that entrepreneurship as scientific construct is distinct	Entrepreneurship is able to change the economic market
Psychological approach	There is no clear difference between traits of entrepreneurs and non-entrepreneurs	The majority of entrepreneurs have some of the favourable traits, while lacking others
Socio Behavioural approach	Entrepreneurship is best understood through the 'entrepreneuring', however a distinct process is still not defined	Entrepreneurs seem to favour and follow creational processes

Table 2.2: Summary of the scientific and practical implications of the economic, psychological and social behavioural approaches.

Table 2.2 illustrates that there is still a lot of uncertainty from a scientific perspective about what entrepreneurship exactly is, while from a practical perspective entrepreneurs make changes to the economic market using creational processes. These observations strengthen this thesis' perspective that in order to deepen the practical understanding of the entrepreneurial process, one should perhaps not follow the scientific tradition of entrepreneurial research but take up knowledge from neighbouring fields. Especially the work of Sarasvathy (2009) on Effectuation illustrated that taking a fresh perspective that does not merely builds on existing knowledge from the field of entrepreneurship can open up new perspectives that help the practice of entrepreneurship forward.

The next section will review the literature that focuses on research in education of entrepreneurship. Together with the insights from scientific and practical view on entrepreneurship, this will be the foundation of this thesis from the entrepreneurial perspective.

2.6 The Education of Entrepreneurship

This section examines the entrepreneurial education literature on the new venture creation process. The preconception of educating for the act of entrepreneuring is also described by the example of Moroder: *It was almost impossible because the dream was so big, that I didn't see any chance because I was living in a little town, I was studying. And when I finally broke away from school and became a musician, I thought "well now I may have a bit of a chance"*. It has the idea that once the entrepreneur breaks away from school, he or she can become an entrepreneur. The examples of Bill Gates dropping out of Harvard and starting Microsoft, and Mark Zuckerberg also leaving Harvard to start Facebook, are well known examples that are often referred to. The discussion in section 2.3 illustrated that 'the entrepreneur' does not exist in scientific terms and just because Gates and Zuckerberg succeeded without education, does not mean that there is no value in entrepreneurial education. As Drucker (1985) mentions: *"The entrepreneurial mystique? It's not magic, it's not mysterious, and it has nothing to do with the genes. It's a discipline. And, like any discipline, it can be learned."* Ten years later, Gorman, Hanlon, and King (1997) reviewed 10 years (1985 till 1994) of literature on entrepreneurship and small business management education and concluded that *"[…] most of the empirical studies surveyed indicated that entrepreneurship can be taught, or at least encouraged, by entrepreneurial education.*

The difference that Gorman et al. (1997) mentions between 'taught' and 'encouraged' is relevant because it signifies two schools of thought

in entrepreneurship education research. The first school of thought proposes that entrepreneurship education should be about the transfer of knowledge about topics and subjects 'about' entrepreneurship. The second school of thought advocates to actively educate students in the process of starting a new venture.

The first school of thought is the largest. Katz (2003) provides an extensive overview on the different functions of entrepreneurship education. He mapped entrepreneurship education since the last 150 years. Katz concluded that already in 2003, American entrepreneurship education has reached maturity, in the sense that it is known what subjects about entrepreneurship should be educated. The main focus is on educating strategy, managing growth, idea generation, risk and rationality, financing, and creativity, as being important elements in the new venture creation process (Fiet, 2001b). The focus as described by Fiet remained the same in recent years (Fayolle, 2013).

Before going into the theoretical discussion on the difference between the encouraging and educating function of entrepreneurship education, first the context of this thesis is mapped out in more detail. In the context of this thesis, the different roles of educating and encouraging are taken up by different parties. Connected to the Delft University of Technology, there is the YES!Delft incubator. An incubator is described as a *"facility established to nurture young (start-up) firms during their early months or years. It usually provides affordable space, shared offices and services, hand-on management training, marketing support and, often, access to some form of financing"* (Business Dictionary, 2017). YES!Delft started in 2005 as an initiative from the Delft University of Technology, the City of Delft and TNO (Dutch Organization for Applied Scientific Research) with the aim to foster entrepreneurship and new high-tech ventures in the area of Delft. The main target audience were (future) entrepreneurs working on technological developments.

However, YES!Delft soon discovered that it was not easy for students to 'choose a career' as entrepreneur. The majority of students had no idea about entrepreneurship in the first place and thus had to be 'encouraged'.

Therefore, in 2009, YES!Delft Students was initiated, as an organization ran by students with support from both YES!Delft and the Delft University of Technology. The mission of YES!Delft students is to *"stimulate and support students of the TU Delft and the surrounding area to expand their horizon and learn more about the world of entrepreneurship."* YES!Delft Students encourages students to consider the career choice of starting a (high tech) new venture, so that they are encouraged to enter the YES!Delft incubator once the students graduate. As the website of YES!Delft Students states: "*With inspiring lectures, playful activities, courses, professional programs and an open-door policy, we offer you all the possibilities in the world to develop yourself in the dynamic field of entrepreneurship.*"

The task of YES!Delft is to support the young entrepreneurs to start their new venture. Interestingly, students can only enter the incubation program once they have graduated. The reason is partly political; the Delft university of technology wants to stimulate entrepreneurship on the one hand, but on the other hand wants students to finish their education first. This leads to an interesting situation of encouraging students so much that they become interested in choosing entrepreneurship as a career choice, but can only carry out their choice once they have finished their education.

The examples of YES!Delft and YES!Delft Students illustrates the fine line between the education and practice of entrepreneurship. If educating is considered to be more than only 'encouraging', it means that students need to practice the act of starting a new venture while being a student. The concept of the 'practicing student entrepreneur' has been debated within YES!Delft, but also in the literature. The scientific

notion of a student entrepreneur is difficult, since the scientific rationale seems to be that an entrepreneur is something that you become; like a student becomes an engineer once the student has finished an engineering degree. Research therefore prefers the concept of 'graduate entrepreneurship' (Fenton & Barry, 2014; Hannon, Collins, & Smith, 2005; Nabi, Holden, & Walmsley, 2010). Nielsen and Gartner (2017) mention that "*Graduate entrepreneurship suggests that entrepreneurship is something students simply pursue after graduation and not during their studies. In particular, the idea that students are both students and entrepreneurs at the very same has received less attention*" (Nielsen & Gartner, 2017, pp. 136-137). This thesis will pay more attention to the call of Nielsen and Gartner to investigate how students are practicing the role of student and entrepreneur at the same time. However, this thesis takes another angle as Nielsen and Gartner (2017). Nielsen and Gartner talk about student and entrepreneurial identity, and propose a framework to identify how 'students' identify themselves sometimes as a student while at other times as an entrepreneur, or a combination between the two. At the same time, Nielsen and Gartner also recognize that the wider complexity and process of what is going on when students act as entrepreneurs has seldom been studied (see also Nabi, Holden, and Walmsley (2006)). This thesis will therefore focus on how student entrepreneurs act in the process of starting their new venture while they receive educational credits because of their academic learning.

If the aim of YES!Delft Students is to encourage entrepreneurship, and the aim of YES!Delft is to enable entrepreneurs to fully engage in their new venture, then the aim of university education is to be the bridge between those two (Figure 2.6).

Figure 2.6: The different roles of YES!Delft Students, TU Delft and YES!Delft

It is the role of YES!Delft Students to encourage students 'to become' entrepreneurial, and it is the task of the education to kick start the act of entrepreneuring so the transition towards entering YES!Delft is smooth. At the TU Delft, the task of (research and) education in entrepreneurship is taken up by the Delft Centre of Entrepreneurship (DCE). DCE is part of the Faculty of Technology, Policy and Management. DCE provides education programs at bachelor and master level and contributes to PhD training and other teaching programs. The programs serve approximately 550 students across the faculties of TU Delft with a goal to increase their entrepreneurial activity and, eventually, the start of new technology-based firms or venture projects within established organisations. Therefore, this thesis looks less into the education "about" and "for" entrepreneurship as is the dominant academic learning approach at universities (Robinson et al., 2016). Instead, this thesis focuses on the development of students "through" entrepreneurship education, as advocated by Pittaway and Edwards (2012) and Nielsen and Gartner (2017). This means that students proactively and experiential-based learn about the development of their own new venture. The learning of students is based on the activity of doing entrepreneurship, in a 'real life setting'.

At first glance, it seems logical that students are activity engaged in the act of 'entrepreneuring', while studying entrepreneurship, but this is not the case. Twenty years ago, Solomon, Weaver, and Fernald Jr (1994) investigated the main way of assessing by analysing 2-year college programs in the United States. The main method for assessing were by tests (41%), followed by case studies (19%) and writing a business plan (17%). Only 4% of the tests were based on individual assignments and even less (2%) based on group assignments. It is only in the group and individual assignments, that education 'thought' entrepreneurship can be assessed, so the combined 6% of assignment assessing is low. Through writing a business plan it is also possible to assess the learning of entrepreneurial students through entrepreneurial activities, if the business plan is written on their own new venture. Solomon et al. (1994) describe, however, that students are often asked to write a fictive business plan as an educational exercise, and not as part of the development of their own business.

Solomon et al. (1994) are worried that by mainly assessing entrepreneurial knowledge by tests, it is less likely that students will actually engage in the act of starting a new venture. They concluded that *"it is hoped that educators and trainers will continue to move toward more unconventional, experiential-based teaching and evaluation methods"* (Solomon et al., 1994, p. 350).

Vesper (1999) points out why it is so hard to respond to the call of Solomon and his colleagues by describing the main challenges of entrepreneurship education. These challenges are still evident today, and therefore Vesper is quoted at length:

> *Entrepreneurship in universities still must deal with barriers and constraints that we should keep finding ways to penetrate. Entrepreneurship in universities has so far been developed as an add-on to business education, first as an elective course, then more courses, and finally as a concentration, major or program. So far it has largely*

> *been tucked in around the existing core. Its teachers presently must be approved by established faculty of other fields. Its courses currently must fit into the existing curriculum, grading system and calendar. It serves the students who for the most part apply for a conventional business education. To quote a famous past-president's wife, I suppose there's nothing really wrong with that. But what might be different if we had started first with a school of entrepreneurship and then added a few courses for a concentration or major in middle management? (Vesper, 1999, p. 14)*

The notion of Vesper is useful because he points out that the embeddedness in the existing (business) curriculum is possibly problematic. In the business school curriculum, it is more accepted to educate 'about' and 'for' business. Once graduated, business students will have the opportunity to implement this knowledge in their daily work in an organization. Entrepreneurial students lack this luxury; the day they graduate they need to be ready to use their knowledge in their daily activities on starting their new venture. Therefore, the entrepreneurial students better gain experience in the new venture creation process throughout their studies. However, the integration of the entrepreneurial curriculum into the business curriculum did not yet allow (much) for this experiential learning.

Kuratko (2005) refers back to Vesper (1999) to conclude that entrepreneurial education is still not experiential based. Kuratko illustrates that entrepreneurship education focuses on the similarities and differences between entrepreneurship and management, the advantages of corporate entrepreneurship, the risk and trade-offs of an entrepreneurial career and women and minority entrepreneurship. The same challenges as described by Solomon et al. (1994) were still present in 2005.

In more recent research, Middleton and Donnellon (2014) make the same observation as Solomon et al. (1994) and Kuratko (2005) about the lack of experiential learning, and offer a possible solution.

Middleton and Donnellon (2014) build on Rae (2005) and Rigg and O'Dwyer (2012) and state that for experiential learning, education should not only focus on the 'know what' and the 'know how', but should also focus on the 'know why' of the entrepreneurial learner, a topic that is under-researched. Students figuring out the 'know why' of their entrepreneurial learning could differentiate entrepreneurship education from other business educations. Ultimately, the aim of entrepreneurship is to start the new venture. Only knowing about the construct of entrepreneurship, and knowing how to apply knowledge about entrepreneurship is not enough. Students should know not only 'how' but also 'why' they want to apply this knowledge if they want to start their new venture. These three learnings combined are the basis of good experiential learning.

Middleton and Donnellon (2014) align their analysis with Winterton's taxonomy distinguishing cognition, function and person (Winterton, 2002) and Johannisson's taxonomy of entrepreneurial competencies (Johannisson, 1991). This results in the framework in Figure 2.7 to

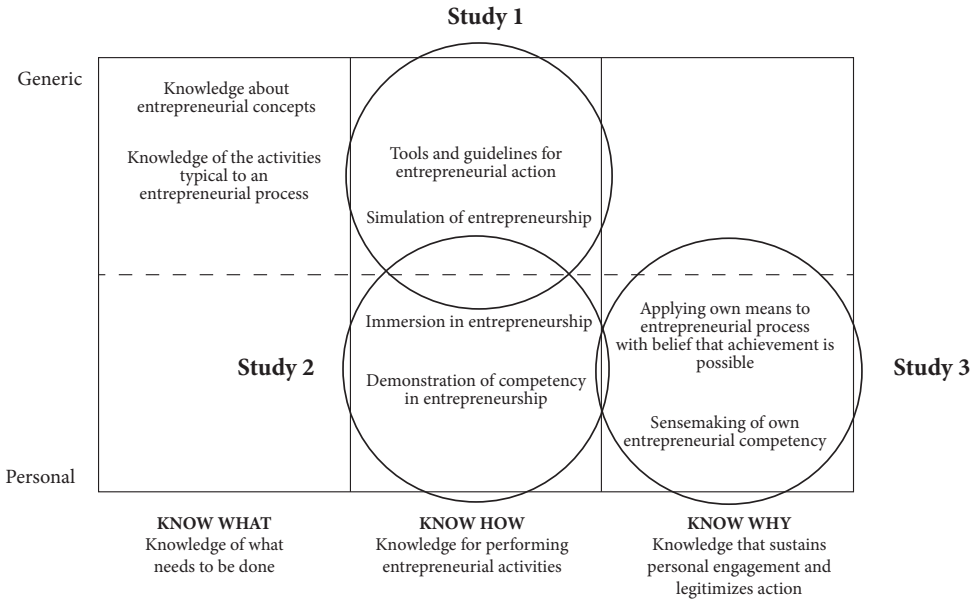


Figure 2.7: Knowledge framework on entrepreneurial action in education (Middleton & Donnellon, 2014) to map the focus of the three empirical studies

differentiate between generic and personal learning on the vertical axis, and 'know what', 'know how' and 'know why' at the horizontal axis.

The upper left corner (generic – know what) is already filled with extensive knowledge from the scientific field of entrepreneurship. However, the "Generic Know-how", the "Personal Know-how" and the "Personal Know-why" are not easily answered by theoretical and practical knowledge, or the outcomes of research on entrepreneurial education as the review in this current chapter has illustrated. Therefore, the three empirical studies in this thesis will provide insights for each of these cells.

Although the call for more experiential-based entrepreneurship learning and education has echoed in entrepreneurial education research since the last 25 years, this call has only occasionally been answered in the daily activities of entrepreneurship education. The main reason seems to be the embeddedness of entrepreneurship education for the business school, where the curriculum focuses on predictability and control, which does not match the complexity and fuzziness of the new venture creation process. It is more suited for a business school to assess entrepreneurial graduates on their knowledge 'about' entrepreneurship and the new venture creation process. This thesis starts from the presumption that by linking the new venture creation education to design theory and practice, students engage in experiential-based learning about the new venture creation process, while being engaged in the act of starting up their new venture. Chapter 3 will explore the design theory and practice in detail in relation to entrepreneurship education.

2.7 Conclusion: Need for new insights

The scientific literature on entrepreneurship and entrepreneurship education only partly answers RQ1 on how to better understand and

educate the new venture creation process. The conclusion of this chapter is based on the captive triangle of Usher and Bryant (2014) of scientific knowledge, practical knowledge and educational research activities.

The scientific knowledge from the field of entrepreneurship about the business proposition development process, is not sufficient as a theoretical basis to educate the process of business proposition development. The practical knowledge is situational, since this thesis follows the line of the student entrepreneur learning 'through' entrepreneurship. The educational research activities illustrated that there is a need for more research into experiential learning activities around the business proposition development process, as proposed by Middleton and Donnellon (2014) and Nielsen and Gartner (2017).

Chapters 5, 6 and 7 will provide empirical contributions to the entrepreneurial education knowledge through (educational) research activities. First, chapter 3 will assess the design literature, and discuss which constructs from the field of design are helpful to better understand and educate the business proposition development process.

Once I wanted to be the greatest
Two fists of solid rock
With brains that could explain
any feeling

The Greatest, Cat Power, 2006

3. Designing the business proposition of a new venture

Chapter 2 assessed the entrepreneurship (education) literature and concluded that the entrepreneurship literature does not provide all the necessary elements to fully understand and educate the development of the business proposition. This chapter will assess the design literature in search for theoretical and practical constructs that help to understand the development of the business proposition. These constructs will be used to expand the understanding on how to educate through entrepreneurship, by educating through design activities. Overall, this chapter explores research question 2 in the context of this thesis:

RQ2: Which design constructs are needed to better understand the business proposition development process?

3.1 Design and Entrepreneurship

There has been some research on the similarities between the entrepreneurial process and the design process. For example, Mata Garciá (2014) proposes that the design process and the entrepreneurial process show similarities and that *"both processes can feed each other"*. Mata Garciá (2014) is not explicit in which phases the feeding would be most effective. By linking 'the entrepreneurial opportunity' to 'the design concept' in the front end of both innovation processes, the work of Mata Garciá shows similarities with the definition of the opportunity by Dimov (2007) and the process models of Sarasvathy (2009) and Ries (2011).

Müller and Thoring (2012) follow a similar line of thought as Mata Garciá and combine Design Thinking and the Lean Start-up process. Their description is more precise than Mata Garciá's description because they explain how most design thinking elements are important early on in the entrepreneurial process and the lean start-up elements are important later on in the process. The view of Müller and Thoring (2012) recognises that the new venture creation process (in their work embodied by the Lean Start-up) has its own distinct value, next to design theory.

Glen, Suciu, and Baughn (2014) build on the work of Müller and Thoring (2012), and make a call to incorporate 'design thinking' in entrepreneurship education. They propose to find ways in which design thinking complements, and not replaces, the analytical way of thinking and working that is advocated by management and economic education. In answering the call from Glen et al. (2014) to find ways to incorporate design thinking in entrepreneurship education, Garbuio et al. (2017) propose "design cognition" as a way of thinking to improve entrepreneurship education. Their work assesses how the ways in which designers think, can benefit entrepreneurial students to learn.

The scholarly work discussed above provides first insights that the new venture creation process has elements of 'design'. The terms 'design', 'design thinking' and 'design cognition' have been used loosely, without systematically defining what the authors mean with the underlying, scientific and/or practical notions of design, a design process or design cognition. Therefore, the next sections review these different notions of design and design thinking to better assess which constructs from the design literature can be useful to better understand the business proposition development process in new ventures.

3.2 Introducing a matrix to map different design views

To develop a deeper understanding of the different schools of thought on the design process, this chapter will first introduce a matrix to systematically address the different views of the design process. First, this chapter will differentiate between 'design(erly) thinking' and 'design as social process'. The focus of designerly thinking is how the 'designer' thinks and works with a designerly problem. Section 3.3 will explore the understanding of designerly thinking in more depth. In the view of design as social process, all actors (designers and non-designers) in the process are 'active co-designers', meaning that the design process takes place between the actors involved. The focus is not on how a single 'designer' works, but how the mix of designers and non-designers collaborate in the social process of design. Section 3.5 will explore this understanding in more depth.

Second, this thesis will differentiate between the 'design process', and 'the embedded design process'. Constructs of the field of design have often been embedded in innovation (process) models. The fields of design and innovation partly overlap. Design scholars have considered the limitations of the design process and described ways how the design process is part of an innovation processes. Other processes take place, before and after, and in parallel to, the design process. Chapter 2 illustrated the overlap between the entrepreneurial processes and innovation processes. Section 3.4 will investigate embedded design processes that are built on a designerly thinking perspective. Section 3.6 will investigate embedded design processes that are built on the perspective of design as a social process.

Overall, Table 3.1 describes how the different schools of thought on the design process are assessed in this chapter.

	Design Process Designing →	**Embedded Design process** → → → Designing →
Design(erly) Thinking 	Section 3.3	Section 3.4
Design as a Social Process 	Section 3.5	Section 3.6

Table 3.1: A matrix to map different design process perspectives.

At the end of this chapter, in section 3.7, this matrix will be used again to summarise the relevant literature in each cell, and how the specific literature will be used in the empirical parts of this thesis.

3.3 Design(erly) Thinking

Whereas the discussion about design in the entrepreneurship literature is relatively new, the application of design literature in innovation and management theory and practice has a longer history. Several scholars mentioned the 'innovation potential' of design (Borja de Mozota, 2010; Perks, Cooper, & Jones, 2005; Von Stamm, 2003) Other researchers pointed out how the designer as a professional has an impact on innovation (Dorst, 2006; Lawson, 2006; Verganti, 2009) and the importance of innovators to be professionally trained as designers (Jahnke, 2012; Kimbell, 2011). Also, the impact of the design on product development is discussed extensively (Gemser & Leenders, 2001; Luchs

& Swan, 2011; Veryzer & Borja de Mozota, 2005). These developments can be categorized under the school of design thinking, which describes a human-centred approach to innovation based on the ways in which designers think and work (Brown, 2008, 2009; Martin, 2009).

Brown (2008, 2009) and Martin (2009) mentioned that *all* disciplines could take inspiration and learn from the way designers think and work. Design thinking could not only improve innovation itself, but also, for example, strategy, new product development and organisational renewal (Brown, 2009; Brown & Katz, 2011; Frisendal, 2012). Furthermore, Design Thinking could help companies to come up with new ways to address problems, to come up with breakthrough ideas, and to find a better balance between exploration and exploitation (Dunne & Martin, 2006; Martin, 2009). Research on Design Thinking has a focus on the applicability of design thinking in practice, and several large organizations, like Apple, Samsung and 3M, have already adopted ideas of Design Thinking (Holloway, 2009; Lafley & Charan, 2008; Martin, 2011; McCreary, 2010). Where the entrepreneurship literature is sometimes lacking a clear connection to practice, the design thinking literature is sometimes missing the embeddedness in theory. For example, the few authors define well what they mean when discussing design (thinking). Johansson-Sköldberg et al. (2013) argue that a reason for this lack of definition is that there is a difference between the original notion of how designers think and work, and how this notion is taken up by business and management under the umbrella of Design Thinking. Johansson-Sköldberg et al. (2013) differentiate between 'Designerly Thinking' as a robustly researched construct with implications for practice, and 'Design Thinking', which is mostly coined by practitioners and is based more on anecdotal evidence than on extensive research (table 3.2, next page).

Designerly Thinking	Design Thinking
This refers to the academic construction of the professional designer's practice (practical skills and competences) and theoretical reflections around how to interpret and characterize this non-verbal competence of the designers. Designerly thinking links theory and practice from a design perspective, and is accordingly rooted in the academic field of design.	This term refers to the discourse where design practice and competences are used beyond the design context (including art and architecture), for and with people without a scholarly background in design, particularly in management. 'Design thinking' then becomes a simplified version of 'designerly thinking' or a way of describing a designer's methods that is integrated into an academic or practical management discourse.

Table 3.2: Designerly Thinking versus Design Thinking (adapted from Johansson-Sköldberg et al. (2013, p. 123))

It is interesting that Johansson-Sköldberg et al. (2013) describe design thinking as a simplified version of designerly thinking. Their remarks suggest that there is a deeper truth and understanding in the stream of designerly thinking, that did not find its translation in the business application of design thinking. The question is if working with 'a simplified version' is a conscious choice by the design thinking authors, or if design thinking research fundamentally misses an ontological frame that allow design thinking to be more rigorous.

The latter seems to be the case. Carlgren, Rauth, and Elmquist (2016) notice that the most cited article to date on design thinking (Brown, 2008) defines design thinking in multiple ways within the same article. Brown discusses a 'team-based approach to innovation' (Brown, 2008,

p. 86), a discipline (Brown, 2008, p. 86), and part of a development process (Brown, 2008, pp. 88 - 89). Furthermore, the article suggests that everyone with the right 'aptitude' (Brown, 2008, p. 87) is capable of solving any kind of social problem using design thinking (Brown, 2008, p. 92).

Since the scholarly work of the application of design within entrepreneurship is still limited, it offers the opportunity to build a stronger foundation when applying design to the field of entrepreneurship. Johansson-Sköldberg et al. (2013) mention that the biggest challenges of design thinking: "*Design thinking is often equated to creativity: Sometimes the popular version 'design thinking' is presented as a way to make managers think more creatively. But being creative is only part of the competence and practice of the designer's work." (Johansson-Sköldberg et al., 2013, p. 131)* and *"Design thinking is often equated to a toolbox: Sometimes the popular versions focus on the designer's specific methods taken out of context, as tools ready for use, but the person using the tools must have the knowledge and skill – competence that comes with training – to know when to use them (Johansson-Sköldberg et al., 2013, p. 132)*. By learning from the shortcomings of design thinking, this thesis aims to present a stronger theoretical understanding of design applications, beyond creativity and a tools box, suited for the business proposition development process for new ventures. Therefore, the next section examines "designerly thinking" in more detail to better identify which constructs and definitions will be used throughout this thesis. Johansson-Sköldberg et al. (2013) describe that the theoretical perspective on designerly thinking can be categorized into five sub categories:

- Design and designerly thinking as the creation of artefacts (Simon, 1963);
- Design and designerly thinking as a reflective practice (Schön, 1984);
- Design and designerly thinking as a problem-solving activity

(Buchanan, 1992);

- Design and designerly thinking as a way of reasoning (Cross, 2006, 2011; Lawson, 2006);

- Design and designerly thinking as creation of meaning (Krippendorff, 2006).

Simon's (1963) notion of the *creation of artefacts* is based on the idea that 'creation' defines the character of design research, while other sciences deal with *that what already exists*. This notion was important in the 1960s to legitimise the more experimental approach of design research in contrast to the more traditional approaches of established research. Although the theoretical claim of *design* dealing with creation may be legitimate, it is unrealistic to assume that in practice, design would be the only discipline dealing with creation. In that light, the work of Simon should not be seen as a final workable definition of design in practice. Instead, Simon could be seen as the *founding father* of the field of design (thinking) that allowed others to further develop theories of design.

Schön's (1984) *reflective practice* perspective is in a way a critique on the work of Simon, mainly on an epistemological level. Where Simon provided a rather rational view on design, Schön saw more value in describing design from a pragmatic perspective. Simon's work could be described as an objective framework for the whole field of design while Schön was more interested in 'the people' and described the designers in practice. Schön argued that more than creation, design is about first creating and then constantly improving through 'reflection-upon-the-creation'. Schön's view is best understood in comparison with the work of managers. According to Schön, managers also reflect in action, but they rarely reflect on their reflection-in-action. It is in this double layered constant reflecting in action that designing is different from other ways of working.

By the introduction of Wicked Problems, Buchanan (1992) is often considered the first scholar to bring in a true 'design perspective' on design and designerly thinking. Rittel and Webber (1973) already introduced wicked problems as an alternative to a step-by-step approach to problem solving. Traditionally there was first an analytical phase of problem definition, followed by a creative phase and synthetic phase of problem solution. By the introduction of wicked problems, Buchanan proposed that designers work on the problem definition and the problem solution, simultaneously. Dorst and Cross (2001) called this the co-evolution of design problems. Buchanan originally saw the main applications of working with wicked problems in symbolic and visual communications (or graphic design), material objects (or industrial design), activities and organizational services (or service design), complex systems or environments for living, working, playing and learning, since these fields all have a creative element. Dorst (2015) extended the applicability of wicked problems to more fields of application, claiming that almost all problems in all fields could be solved using wicked problems solving techniques.

The work of Lawson (2006) and Cross (2006, 2011) could be seen as a continuation of the work by Schön, to describe how design professionals go through a design process. Where the work of Schön was mainly philosophical, both Lawson and Cross drew their theories on practice. By analysing design workshops and the daily practice of design, both Lawson and Cross developed their own models of the design process. Cross aimed to link his findings to already existing descriptive design models. For example, Cross (1989) mentions the work of Pahl and Beitz (1984), who introduce a consecutive process of task, specification, concept, preliminary layout, definite layout, documentation and solution. Cross (1989) combines insights from Pahl and Beitz's models and other existing design models and presents a recursive representation of a design strategy followed by creative designers. His model is both

descriptive and prescriptive; to make sense of the designerly process by observing the way designers work, and to provide advice how designers could improve their design practice. He builds on the notion of wicked problems by putting emphasis on the development of problems and solutions simultaneously. The work of Cross is useful for this thesis because it offers insights in the different steps that make up the total design process. These steps, such as problem identification and solution development, are similar to the steps in the new venture creation processes, which will be elaborated upon in the empirical part of this thesis.

Finally, Krippendorff (2006) introduced the notion of design as the creation of meaning. Krippendorff's notion is best contrasted with Simon's view of the artefact, on a philosophical and semantic level. Simon started with 'the thing' in the first place and would claim that 'this thing' could have meaning once designed. In contrast, Krippendorff would claim that a designer designs the meaning first, which is then embodied in the 'thing'. Krippendorff's analysis is useful to understand the cognitive actions of designers in a broader context. For example, Verganti (2009) took up Krippendorff's notion of the creation of meaning to describe how in innovation processes, innovation of meaning is as important as innovation of technology.

Johansson-Sköldberg et al. (2013) describe that the five different views could be categorized into three main categories. First, the work of Simon signifies the rationalized, systemic study of design. Second, the work of Krippendorff signifies the hermeneutic approach of meaning creation through design. Finally, the work of Schön, Buchanan, Cross and Lawson signifies designerly thinking in practice. Johansson-Sköldberg et al. (2013) describe that the main differences between the scholars in the category 'designerly thinking in practice' is that Schön theorized "about" the design practice, Buchanan theorized about the design problems, and

Lawson and Cross theorized about the designers' specific awareness and capabilities in practice. Furthermore, Johansson-Sköldberg et al. (2013) describe how Simon discusses 'design science', Krippendorff's work signifies 'science for design' and Cross' focuses on 'science of design'.

This thesis will follow the line of designerly thinking in practice. As discussed in chapter 2, one of the challenges of the academic field of entrepreneurship is to build theory that is scientifically rigid on the one hand, and has practical implications on the other hand. In addition, this thesis focuses on education through entrepreneurship, where students learn about the new venture creation process both in theory and *in practice.* The work of Schön, Buchanan, Cross and Lawson illustrates that this dual theory and practice approach has proven fruitful in the field of designerly thinking.

3.4 Embedded Designerly Thinking

Considering the different schools of thought in Design(erly) Thinking, the next sections investigate how Design(erly) Thinking fits in a more general innovation process. As the previous sections explained, Cross already extended his work toward the field of innovation. From the notions of Cross and Lawson, other models appeared. Most recognized (both in theory and practice) is the model by Roozenburg and Eekels (1995). Figure 3.1 illustrates their model.

The work of Roozenburg and Eekels is relevant because it covers the whole innovation process in a systematic way. Furthermore, they consider both actions (the boxes in figure 3.1) and different 'stages' of the product innovation process (the circles). Considering the discussion on design thinking, it is remarkable to notice that 'designing' only takes places in the stages between 'the new product idea' and 'the production of the idea'. Section 3.3 illustrated that design(erly) thinking can improves strategic and product development activities as well. For this thesis, it is therefore important to explore process models where design activities are embedded throughout the whole process.

Smulders, Vermaas and Dorst (2014) present a complimentary view to the work of Roozenburg and Eekels. They introduced the IDER-model to provide an integrated vocabulary to describe generic activities within innovation processes. Their view is relevant because it moves away from the 'stage gate' approach that signifies the work of Roozenburg and Eekels. The review is chapter 2 illustrated that entrepreneurs are not likely to work in a stage gate approach, but rather work on several activities simultaneously.

Smulders et al. (2014) identified four sets of activities: Initiating (I), Designing (D), Engineering (E) and Realizing (R). Initiating (I) is defined as the activities in the front end of development, focusing on idea generation and market studies. These I-activities often lead to fresh and useful new insights.

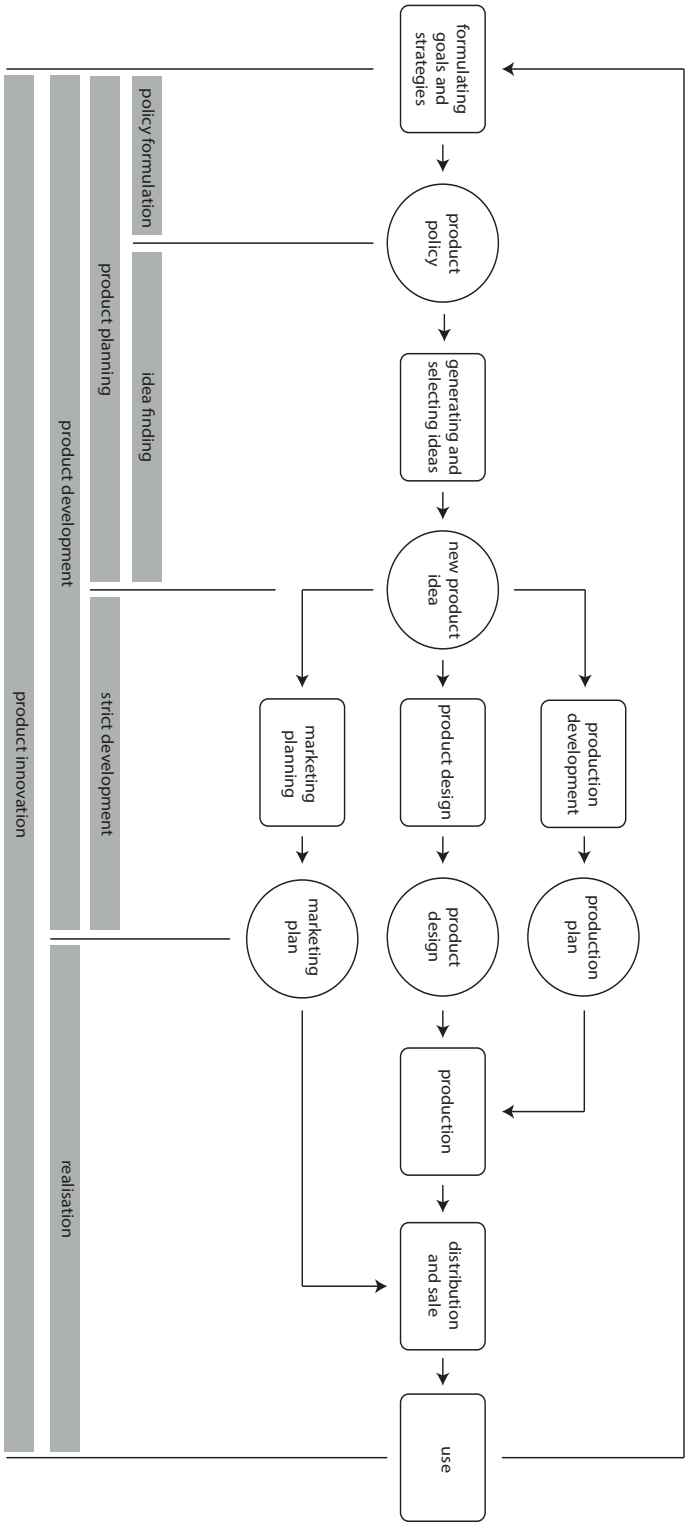
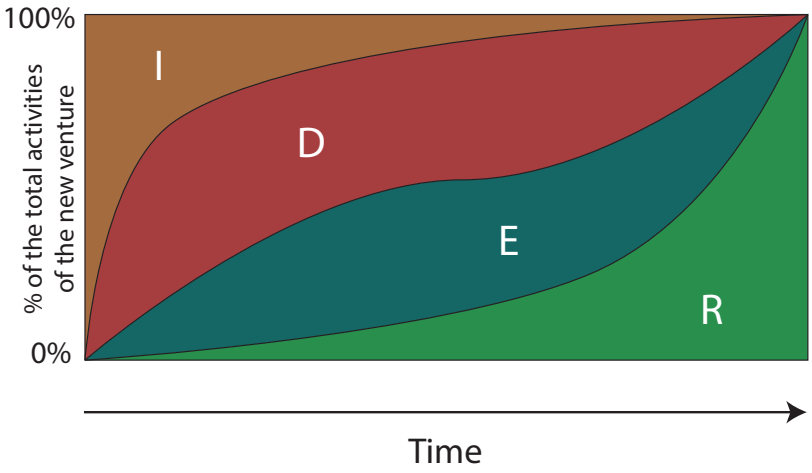


Figure 3.1: The embedded activity of design in the Product Innovation Process (Roozenburg and Eekels (1995))

Designing (D) is defined as the development of new concepts. After the first identification of a problem area and the initial generation of an idea, designing is about creating a frame (Dorst, 2015) for the business proposition. This frame will lead to an understanding of how the problem and solution fit together, as described by Buchanan (1992). Seen from an Entrepreneurial perspective, D-activities lead to a conceptual understanding of the business proposition. Engineering (E) is defined as the 'robustinising' of the developed concepts. E-activities validate the concept and serve to get the business proposition ready for implementation. Realization (R) is defined as the finalization and market implementation of the business proposition. R-activities involve logistics, production, and sales. R-activities apply the knowledge that result from the previous I, D & E-activities. These activities have a generic nature, meaning that all development activities regarding any object of development will follow the IDER-sequence (Smulders, 2014). This implies that the sequence of IDER activities are recursive throughout the overall innovation process.

An important characteristic of the IDER model is that while all activities may take place simultaneously, their emphasis changes over time. From a sole focus on initiation activities at the start of the new venture creation process, to a mix of Initiation (I), Design (D), Engineering (E) and Realization (R) activities during the process, to almost full Realization at the end. Throughout the process, new I input is needed for any D activity, and new I and D input for E activities. Finally, even when the process consists almost entirely of R activities, it is often still necessary to engage in I, D and E activities (Figure 3.2). This could be, for example, a small change in the final packaging that needs to be Initiated, Designed and Engineered, which therefore slightly changes the business proposition.



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igure 3.2: Visual representation of the ideal IDER model (adapted from Smulders, 2014)

As chapter 2 described, there are already several models from the field of entrepreneurship that have attempted to describe the business proposition development process in a step-by-step manner. This thesis follows the line of Glen et al. (2014) who call to find ways to integrate design in the entrepreneurial curriculum. The work of Smulders, Dorst, and Vermaas (2014) is useful since it appreciates the embedded role of design in the overall process. Using their model in the empirical part of this thesis may provide insights into how designerly thinking plays a role in the business proposition development process for new high-tech ventures.

3.5 Design as a Social Process

The scientific notion of design as a social process is not discussed as extensively as designerly thinking. Bucciarelli (1988) was the first to specifically discuss design as a social process. Bucciarelli discusses design in the context of engineering design, executed in engineering firms. *"I see designing as all that goes on within the subculture of the*

firm. My frame is that of the ethnographer; my first premise, based upon what I have observed, is that designing is a social process. Now there is a simple 'so what' reaction to this claim: all can agree that designing is done by groups of people acting together, e.g. the design team, but I mean a stronger interpretation." (Bucciarelli, 1988, p. 160). Bucciarelli claims that designing is *only* taking place as a social process, and that designing as an individual activity does not exist. He describes this as Design Discourse and provides three examples.

First, he identifies 'constraining discourse' in which all participants speak out different interests, wishes, requirements and constraints in the design. *These different interests will be pursued in object-world exercises and sorted out and further negotiated in meetings, mostly informal, of different participants* (Bucciarelli, 1988, p. 165). This view is best understood in contrast to 'wicked problems'. Whereas Buchanan (1992) discusses wicked problems as constantly changing and for the designer to find a solution to, Bucciarelli prefers the idea of 'constrains' of all participants constantly shaping and reshaping the design problem and solution.

Second, Bucciarelli talks about 'naming discourse', stating that "*the invention of a name for a part of the design, for a piece of the action, is designing.*" *(Bucciarelli, 1988, p. 165).* By naming the design (part) participants in the design process further set out the boundaries of what is legitimate and what is not. Bucciarelli sees naming discourse as more than just semantics. Whereas in the constraining discourse, all designs options are still open for interpretation; by 'naming' designs become testable. The naming depends on functional characteristics of the design and therefor the legitimacy of the design is at stake.

Finally, he introduces the 'decision discourse', "*Design decision in this instance is best seen as an overlay of interests rather than their synthesis within some flat, cognitive domain*" *(Bucciarelli, 1988, p. 167).* Ultimately,

the social and ambiguous character of the design process continues in the phase of decision making. One hopes that after the constrains and names, a decisions process would be well informed. However, Bucciarelli finds that this decision process also depends on the constantly changing and conflicting interests of all participants.

The main point of Bucciarelli is that different participants think about 'design' in different ways, and ambiguity will always play a role. There is not one unifying way, participants might not agree with each other and in that sense design is a social construct. Bucciarelli moves away from the notion of 'designing the object': *Artefacts, the formal productions participants make in process, are not the design. They do not uniquely define the design or contain, in themselves alone, comprehensive knowledge of the design: this holds at any but the final stage in the process. Artefacts are constituents of design, but like the dictates of a written constitution, they symbolize agreements, are capstones of social exchange and negotiation (Bucciarelli, 1988, p. 168).*

For the aim of this thesis, Bucciarelli's insights are useful because they signify how designers and non-designers are involved in the process (and not necessarily the outcome) of designing. Whereas for design thinking and designerly thinking it remains a question to which extend entrepreneurs could take up the cognitive activities needed 'to design', the view on designing as a social process provides researchers the opportunity to investigate the creation of business propositions in new ventures through this 'social' lens. It is the aim of this thesis to explore which elements of the understanding of design as a social process are most suitable to be translated to the field of entrepreneurship.

Lastly, Bucciarelli (1988) suggest to research the design process through an ethnographic role of participant/observant. In the designerly thinking view, the role of the researcher is to describe what 'the designer' is doing. In the social interaction view the researcher becomes

part of the process of designing. Chapter 4 will go deeper into the notion of the role of researcher as participant/observant.

Next to Bucciarelli, other researchers have discussed design as a social process. For example, Sanders (2008) mapped out the different design disciplines within the total field of design. Sanders explains that the social interaction view is mainly embodied in the Participatory Design Research and the 'Scandinavian' school of Design. Whereas Bucciarelli investigates the social process of participants in a design firm, Sanders is concerned with the social process between 'designers' and 'users'.

Participatory Design originated from the work of Kristen Nygaard's in the 1970s (Ehn & Kyng, 1987; Schuler & Namioka, 1993). In Participatory Design end-users of the designs were invited by designers not only for input, critique or evaluation of products, but to participate and contribute in the role of co-designer. The role of the designer changed because of this movement. In designerly thinking, the designer is doing the activity of design. In the social process, 'the designer' is mostly facilitating the interactions between participants to make a social process of design possible. The Participatory Design movement is mainly signified by the introduction of new tools and techniques to make this new way of 'designing' possible (See Sanders, Brandt, and Binder (2010) for an overview).

Bucciarelli mentions that designing does not focus on the 'end result' but on the social exchange of participants. Spinuzzi (2005) claims that 'participatory design *is* research'. The goal of a participatory design process is to generate new insights, not to generate 'a design'.

Taking the design as research view serious, the field of Design Anthropology is relevant. "*Design Anthropology has become a practice that selectively applies anthropological theory to challenge existing conceptualisations of products, services, technology, users and use*" (Buur

& Matthews, 2008, p. 4). Large companies use design anthropology to deeply study different cultural contexts in which their 'products' are used, with the aim to make 'the familiar strange again'. Whereas in most of the Participatory Design methods the contact time with participants is limited to hours or days, the contact time in Design Anthropology can be weeks or months. Within Design Anthropology, there is a focus on interaction analysis (Heath & Luff, 1991). By studying the moment-to-moment detailed users' practices between each other and with the designs, Design Anthropology can provide a deeper understanding of what is needed in the social process to design better.

3.6 Design as a social process embedded in innovation process models

The best known innovation application of participatory design is the lead-user approach, developed by Von Hippel (2005). The lead user approach is based on the idea that companies, in their innovation process, need to make predictions about how the market will react to their new business propositions. It is only in hindsight that success or failure can be explained. By working with users who already experience 'market needs' a long time before the majority of users experience these needs, companies can develop the business proposition in a better way. The idea is that these lead users also have the mind-sets, skills and tools to co design with the design team. The largest challenge is how to find such a 'lead user'. Von Hippel advises here to look across markets. 'An innovation' that is new in one field, is often known in other fields.

Buur and Matthews (2008) wrote a 'critique' from an innovation perspective on participatory design, design anthropology and the lead user approach. They state that the lead-user approach and design anthropology provide insights into the conditions for innovation, but do not inform about the process of innovation. Participatory Design investigates the process of design, but Buur and Matthews argue that

this process ends before the actual development of the business aspect of the proposition. The participatory Design processes focus on the society and social aspects, but tend to forget about the market impact.

Therefore, Buur and Matthews describe a 'gap' in the design as social process literature, for which they propose Participatory Innovation (The lower left quadrant in Figure 3.3).

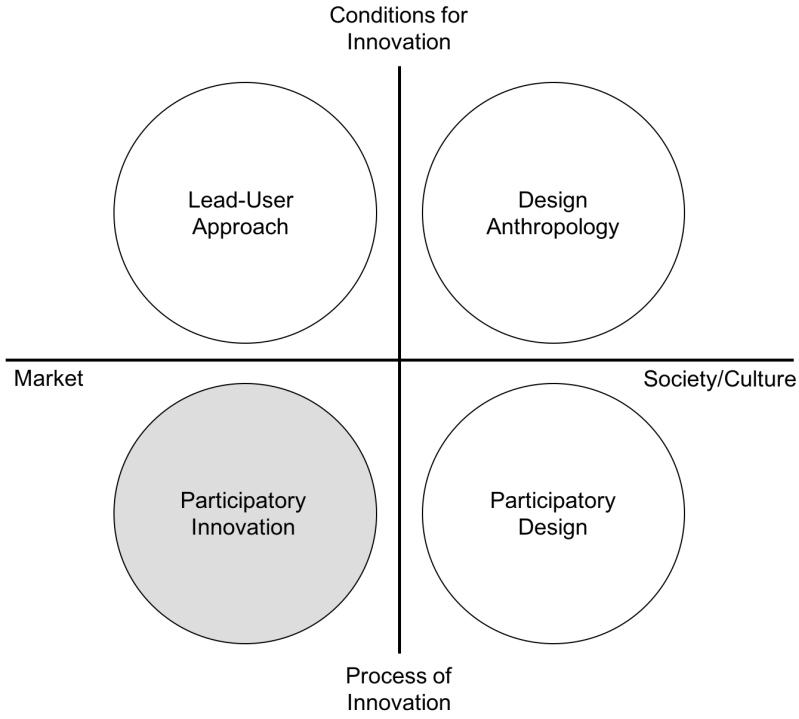

Figure 3.3: The 'gap' that Participatory Innovation is filling (adapted from Buur and Matthews, 2008).

In comparison to Participatory Design and Design Anthropology, Participatory Innovation takes a narrow and technological view of innovation; an innovation is 'good' if the market can adopt it. Simultaneously, Buur and Matthews value the social process of research that signifies Participatory Design.Therefore, Buur and Matthews

describe the purpose of Participatory Innovation as:

> *To generate knowledge about users/customers in a format that inspires company employees to reflect on product, producer role and company identity.*
>
> *To generate business opportunities that relate to a market in the form of product/services concepts with considerations of use, interaction, technology, business model etc. (Buur & Matthews, 2008, p. 15)*

The purpose of generation of business opportunities in Participatory Innovation is similar to the generation of the business proposition in the entrepreneurship literature. Chapter 2 illustrated that Dimov's work on defining opportunities in entrepreneurship also includes both the generation of knowledge and takes into account the whole process of generating business opportunities. The purpose is Participatory Innovation is useful in the context of this thesis to bridge the embedded design literature with the entrepreneurship literature.

Participatory Innovation evolved as a field of research, partly by the organisation of four editions of a participatory innovation conference. In some work based on participatory innovation, authors have made the link to entrepreneurship research. For example, Larsen, Lima, Olsen, and Teneva (2013) investigate how entrepreneurs come together in the context of a business incubator and point out how leadership, becoming part of the initiative and trust and mistrust play an important role in the social process of entrepreneuring. Van Oorschot and Gottlieb (2015) build on participatory innovation to introduce *emerging interdependencies* as results of entrepreneurial processes. Their work focuses on the stakeholders within the entrepreneurial environment who build relationships not based on a formal contract, but rather through the emergence of interdependencies. By relating to the same business propositions, interdependencies around these propositions are shaped. Gottlieb (2017) uses participatory innovation to investigate how the new venture creation process shapes the entrepreneurial identity of

entrepreneurs. He builds on the work of Mead (1934), to emphasize how the entrepreneur 'has' different entrepreneurial identities in relation to different stakeholders in the entrepreneurial process. These first explorations link theory from the field of Participatory Innovation to the field of Entrepreneurship. Therefore, it is promising to dive deeper into the field of participatory innovation in this thesis.

Participatory Innovation is different from designerly thinking and the IDER-model (section 3.3) in terms of what the focus is in understanding the process. Whereas in designerly thinking the focus is on *the activity* of designing by a single actor, in participatory innovation the focus is on the *interaction* between actors (similar to the interaction analysis in participatory design). Buur and Larsen (2010) aim to better understand what is going on in the interactions between participants in the participatory innovation process. They coin the term *Quality of Conversation* and explain that:

> *'Conversations may lead to innovation when:*
>
> *1. Crossing intentions are allowed to surface;*
>
> *2. New themes emerge in the interactions between crossing intentions;*
>
> *3. New, vigorous concepts emerge that resonate with participants' own experiences;*
>
> *4. There is a spontaneity that allows participants to imagine new roles;*
>
> *5. There is an ongoing discussion and readjustment of goals; and*
>
> *6. Facilitation is exercised within the circle of participation, rather than from 'outside'.' (Buur & Larsen, 2010, p. 163)*

Buur and Larsen (2010) explored quality of conversation in Participatory Innovation projects, in which stakeholders from several organizations (e.g. small, large, industry, government) and disciplines (e.g. design, engineering, sales, marketing, manufacturing, policy) come together to work on innovation projects. In the work of Buur and

Larsen (2010), stakeholders come together to work on future projects with stakeholders that are not yet defined and where there is not always a clear way forward. In the context of this thesis, the focus is on new ventures that do not yet exist and there is also not a clear path to success. There are however differences as well. For example, participatory innovation projects take place in industry. Entrepreneurial students start their business in industry, while still being in the environment of the university. There are also a clear differences in budget, resources and relations between the actors involved.

However, the qualities of conversation described by Buur and Larsen are concrete. They offer a good starting point to see how the notions of design as a social process and participatory innovation are related to the field of new venture creation, and business proposition development. This thesis will therefore use the construct of quality of conversation to see how the business proposition develops by the interaction between entrepreneurs and other (non)-entrepreneurs in the new venture creation process. The next section illustrates how they are concretely used in the different empirical studies.

3.7 Conclusion: Using two design views in three empirical studies

The literature exploration in this chapter illustrated that there are two fundamentally different views on 'designing' that could both be suitable to better understand the business proposition development process. This thesis recognized these views as equally important and aims to investigate the different views in different empirical studies.

Table 3.3 summarises the core perspectives of the different schools. It is important to address that the **purpose** of designerly thinking is to *rethink* that what a designer is working on. This purpose is to a large extend the same for design as social process, with this difference that

the rethinking does not take place in the mind of the designer, but rather in interaction between designers and non-designers. These two perspectives link to the definition of the business proposition. This thesis understands the purpose of developing the business proposition of constantly rethinking the business opportunity, how this leads to different concepts, and finally results in a finalized 'product'. It is also in this process that rethinking of the business proposition constantly takes place and therefore the different design perspectives can offer new insights.

	Design Process Designing →	**Embedded Design process** Designing →
Design(erly) Thinking 	How and what a 'designer' does while merely designing	How and what a 'designer' does while designing as one of the activities in an overall 'innovation' process
Design as a Social Process 	How and what happens in interaction between designers and non-designers while merely designing	How and what happens in interaction between designers and non-designers while designing as one of the activities in an overall 'innovation' process

Table 3.3: Schematic overview of the different schools of thought used in this thesis.

Table 3.4 described which specific constructs from each perspective are used in the empirical studies. For 'designerly thinking', this thesis builds on the work on wicked problems (Buchanan, 1992) and the work on reflective practice (Schön, 1984). For 'designing as a social process', this thesis focusses on the work of Bucciarelli (1988) who introduced the notion of design discourse. For the embedded design processes, designerly thinking is embedded into to the IDER model (Smulders, 2014), and designing as social process is embedded into participatory innovation (Buur and Matthews, 2008), and this thesis will specifically

use the construct of quality of conversation (Buur and Larsen, 2010).

	Design Process Designing →	**Embedded Design process** Designing
Design(erly) Thinking 	Wicked Problems and Reflective Practice	The IDER Model
Design as a Social Process 	Design Discourse	Quality of Conversation in Participatory Innovation

Table 3.4: Schematic overview of specific constructs of the different schools of thought used in this thesis.

The empirical studies will mainly use the perspectives of the embedded design process. The reason for this choice is because this thesis aims to address how design activities can have a place in the overall development of entrepreneurship as a field. This thesis does recognise that design activities will always have an embedded role in the larger entrepreneurial processes. It is not the aim of the thesis to isolate the design activities, but to address the relations of the design activities to other activities. It is through this approach that the work of this thesis can contribute to the establishment of entrepreneurship as a field.

The first empirical study (chapter 5) investigates how entrepreneurs are using, or could use, designerly thinking as an embedded activity in the process of the business proposition development. The IDER model will be used in this empirical study.

The second empirical study (chapter 6) investigates how entrepreneurial students and entrepreneurial educators are engaged in the social process of designing the business proposition. The

participatory innovation construct 'Quality of Conversation' will be used in this empirical study.

Finally, this thesis aims to provide a comprehensive view on how multiple design views can improve the understanding and education of the business proposition development process. Therefore, the third empirical study (chapter 7) investigates the business proposition development process both from a designerly thinking perspective as from a design as social process perspective. With the learnings from the first and second empirical study in mind, the third study aims to provide an integrated view of how both design views are experienced by entrepreneurial student throughout the business proposition development process.

This chapter has investigated diverse understandings of the design process; these different understandings ask for different kind of research methodologies. Therefore, the next chapter will describe the different methodologies that will be used in the empirical studies.

This chapter is an adaptation of

Van Oorschot, R., & Smulders, F. (2015). An Exploratory Study into Social Science Methods to Analyze the Process of New Venture Creation. In *Academy of Management Proceedings* (Vol. 2015, No. 1). Academy of Management.

Van Oorschot, R. (2014) Describing the social dynamics in the process of new venture creation. *In Proceedings of the 1st Design Meets Business Conference, Kolding, Denmark*

Things are going to slide, slide in all directions
Won't be nothing
Nothing, you can measure anymore

The Future, Leonard Cohen, 1992

4. Methodology

The introduction of this thesis (Chapter 1) stated that I am interested in an involved and participatory way of conducting research. This chapter will investigate the implications of the chosen research methodologies used in the three studies.

Chapter 3 illustrated that the activity of designing can be both described as designerly thinking and as a social process. Researching these processes asks for different kind of research methodologies. This chapter will describe the different research methodologies used in the three empirical studies, and how these research methodologies are different from each other. The empirical chapters (chapter 5, 6 and 7), will describe in detail how the methods are used in the specific studies.

4.1 Methodological contribution of this thesis

Chapter two assessed the entrepreneurship literature, and concluded that new theories are needed to better understand the business proposition development process. Mullen, Budeva, and Doney (2009)

mapped the methods used in entrepreneurial studies in the top three entrepreneurship journals (Journal of Small Business Management. Entrepreneurship Theory and Practice and Journal of Business Venturing) over the period 2001 till 2008. Out of 665 articles, 64% were quantitative empirical papers, of which 24% articles were based on secondary data. While in 7% of the articles a qualitative method was chosen. 29% of the articles were conceptual. Rispal, Randerson, Jouison-Laffitte, and Zolin (2016) further investigated the methods used in entrepreneurial studies. They investigated 1426 articles in the Journal of Business Venturing, Entrepreneurship Theory and Practice, the International Small Business Journal, and Entrepreneurship and Regional Development over the period from January 2007 to July 2015. Twenty percent of the articles were based on qualitative methods, 55% of the articles were supported by quantitative analysis methods, and 25% were conceptual, pedagogical, or methodological. Whereas the work of Mullen et al. (2009) is objectively analysing the state of the field, Rispal et al. (2016) take a critical stand, and find it troublesome that a majority of the articles uses quantitative research approaches, since there seems to be a tendency that the quantitative methods are used to test existing theory. This seems to be premature considering the state of entrepreneurship as an academic field. Rispal et al. conclude that *"[We] hope that our work will encourage scholars to use qualitative methods to effectively contribute to the field of entrepreneurship and to produce useful theory (Watson, 2013). The challenge for authors is to generate theories that enrich and feed our knowledge in this field, rather than merely rewriting what we already know."* (2016, p31). The work in this thesis addresses this challenge, and therefore this chapter investigates which qualitative methods to use to create new theories. To better understand the conclusions of Rispal et al. (2013), the work of Smulders and de Bont (2012) is useful. They introduced a conceptual and visual model to describe the creation of theory. They discuss the model in

design research. Considering the overlap between the fields of design and entrepreneurship, their model is also applicable for entrepreneurial research (Figure 4.1).

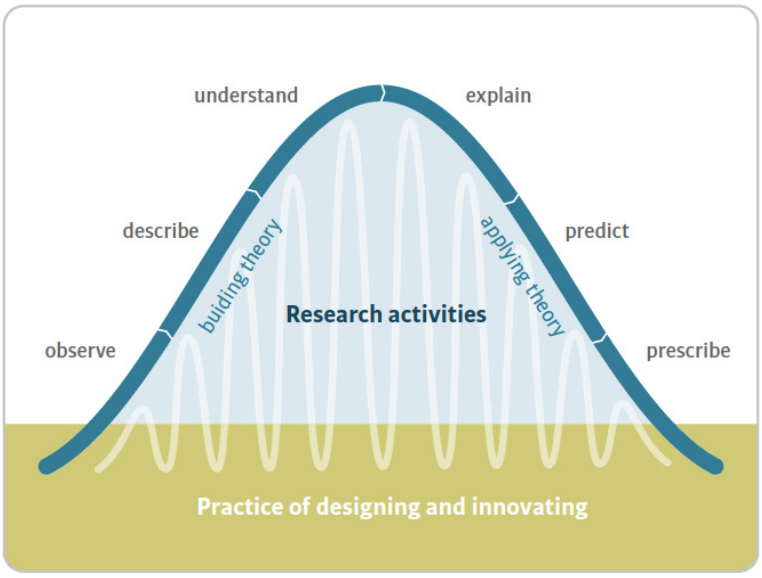

Figure 4.1: the model of Smulders and de Bont (2012) to describe theory building as an interplay between research activities, and practice activities.

Smulders and de Bont (2012) propose how the creation of theory takes place in the interplay between abstract theoretical activities and practical activities. By constantly switching between those two activities, researchers consecutively observe, describe, understand, explain, predict, and finally, prescribe, with the aim to develop new theory. Since there is no consensus yet on what the business proposition development process is, and especially not on how design theories play a role in the process, the first research activities focus on observing, describing and understanding, which is the aim of this thesis. The following sections dive deeper into a range of qualitative research methods suited for observing, describing and understanding.

4.2 Three methodological perspectives

Chapter 3 established that this thesis investigates both the role of designerly thinking and design as a social process in its applications to the business proposition development process. The two perspectives require different research perspectives.

Designerly thinking is an activity-based view. The emphasis is on the (cognitive) activity of a single actor. This actor will always find himself/herself in a social context, but the emphasis is on how this single actor is involved in a range of activities.

Design as a social process is an interaction-based view. The emphasis is on the interactions between multiple actors. All actors perform individual actions by themselves, but the interest lays in how the sum of the activities create new understanding.

These two views are contrasting, especially when the position of the researcher is also considered. It is relevant to address the question to which extent the actions and interactions of the researcher matter and play a role in the business proposition development process. The following visualisations illustrate three different research setting that will be used in the empirical parts of this thesis. The blue circles represent entrepreneurs, and the red circle represents the researcher.

In the first research setting (Figure 4.2), I take the role of investigating the activities of entrepreneurs. This entrepreneur is in interaction with other entrepreneurs, but the unit of analysis are the activities of a single entrepreneur. The involvement of the researcher is small in this approach. I will interview multiple actors. By coding their answers, I will provide insights into their activities, and investigate how the activities of the entrepreneurs relate to design activities.

The method of interviews and coding the interview results is well established both in the field of design research and entrepreneurship

research. Therefore, section 4.3 will provide a brief overview on how the technique of interviews and coding will be used in this thesis.

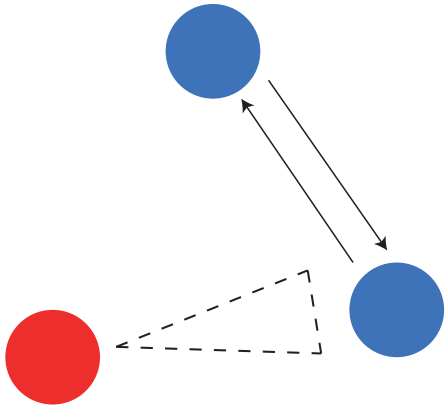

Figure 4.2: The researcher (the red dot) makes sense about the actions of the entrepreneur (the blue dot) from a distant point of view.

In the second research setting (Figure 4.3), The researcher becomes part of the social process of developing the business proposition. The researcher mostly has the role of researcher, but also partly the role of entrepreneur (the blue red combination in figure 4.3). I will analyse coaching sessions (interactive sessions) where my colleagues and I are interacting with student entrepreneurs, with the aim to develop a business proposition for the new ventures of the students. This is a complex process, in which it is not always clear which activities lead to which outcomes. The interactions between participants are the source for potential new insights. The unit of analysis in analysing complex responsive processes is the interactions between (student) entrepreneurs and the entrepreneurial educators (which includes me as a researcher). In the first method, the experiences of the researcher are not relevant for the outcome of the research. In this second method, the experiences of the researcher play a key role, since they are part of the interactions. The method of analysis of complex responsive processes has a tradition in the field of design and innovation processes, but is quite unknown in the field of entrepreneurship. Therefore, section 4.4 will explain analysing complex responsive processes in depth.

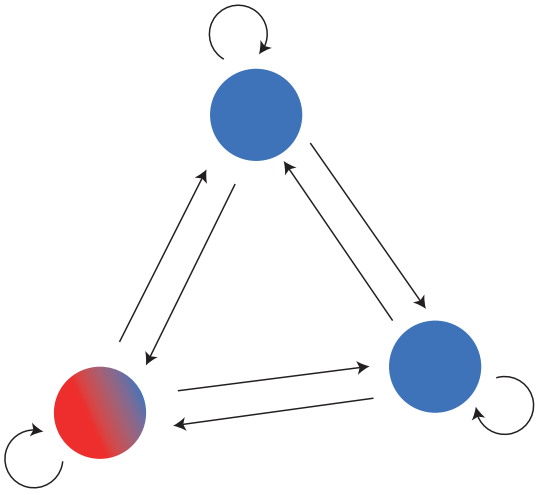

Figure 4.3: The researcher is in interaction with the entrepreneurs. In the interactions and reflections of all participants (entrepreneurs and researchers), new insights emerge.

The third research setting (Figure 4.4), is similar to the second research setting, but there is extra emphasis on the experiences and activities of the researcher. The researcher has the role of researcher and entrepreneur simultaneously (the mix of blue and red in figure 4.4). The third method draws on autoethnography, which means that the experiences and narratives from the researcher are the primary source of data. The unit of analysis are the activities of the researcher (designerly thinking) and the interactions of the researcher with others (design as a social process). The method of autoethnography does not have a long tradition in either the fields of design research and entrepreneurship research. Therefore, section 4.5 will extensively review the literature on autoethnography as a method.

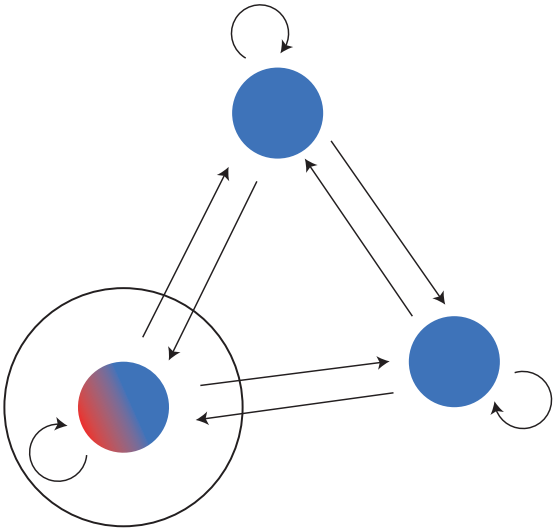

Figure 4.4: In autoethnographic research follows the same logic as in Figure 4.2. However, there is emphasis of the activities of the researcher

4.3 Interviews and Coding

The qualitative research approach of interviewing actors and coding their answers knows a long history both in design and entrepreneurship research. The specific research approach used in the first study has both elements of in-depth interviews (e.g.Boyce & Neale, 2006; Seidman, 1998) and grounded theory research (Glaser & Strauss, 1967). The target of both these approaches in ethnographic research is for a researcher to ask the interviewees about the 'what', 'how' and 'why' or certain events with the aim to uncover the deeper understanding on a topic from the interviewee's point of view.

On the one hand, the first study aims to investigate how the IDER model (Smulders, 2014) applies to the business proposition development process in new high-tech ventures. On the other hand, the first study aims to 'build new theory' about embedded design activities in the process of developing business propositions in new ventures. By asking open-ended question, a researcher can reach both goals. Seidman (1998) advises to 'explore, and not to probe', while interviewing using open-ended questions. The aim of the interviews will be to understand how the business proposition development process in new venture creation can be understood as an IDER process. The answers can also lead to a deeper understanding of both the understanding of the IDER model and the business proposition development process in new ventures. The research activity of interviewing serves both purposes. To ensure a deeper understanding of the phenomenon, Yin (2003) advises to interview multiple actors. The multiple-case study design allows for a method of constant comparative analysis (Glaser and Strauss, 1967). The selected cases will be considered as multiple expansions, which expand the theory under development (Eisenhardt, 1989; Yin, 2003). Hence, the emergent results are grounded in empirical data (Glaser and Strauss, 1967). It is in the process of coding the answers (Yin, 2003), that the researcher can identify which (parts of the) answers can be identified

as IDER activities. Chapter 5 describes how the method is used in the context of the specific study. Considering the visualisation of Smulders and de Bont (Figure 4.1), the first study aims to observe, describe, understand and to a small extent explain the role of designerly thinking in the business proposition development process.

4.4 Sense Making in Complex Responsive Processes

In the second research approach, I will draw on the work of Stacey (e.g. Stacey, 2007; Stacey, Griffin, & Shaw, 2000) who introduced complex responsive processes of relating.

The underlying understanding of the business proposition development process in the interview approach (section 4.3) is based on the rationalist teleology in which new ideas are born in the mind of individuals (the entrepreneurs) (e.g. Shane 2003, Davidsson, 2015). Entrepreneurs take the idea and run it through a series of activities to shape it.

Stacey (2007) argues for a transformative teleology in which novelty constantly emerges in human interactions. Stacey et al. (2000) build on the work of Mead (1934) who introduced Social Behaviourism. The main philosophy of Social Behaviourism is that *"if we want to understand actors, we must base that understanding on what people actually do"* (Mead 1934, p18). This is still in line with the first research approach, that also investigates what people do at any moment during the business proposition development process. However, Mead (1934) takes a rational social point of view by stating that *"the individual mind can exist only in relation to other minds with shared meanings"* (Mead 1934, p5). It is in the social act of communication that meaning is created. Mead describes how we perceive the world as the "means of living" (Mead 1934, p120). It is, for example, only in perceiving 'eating'

that we perceive the concept of 'food'. It is in social and action driven communication that we make sense of the world.

Stacey et al. (2000) took up this notion and applied it to organizational theory in order to describe how to understand an organization as human interactions. In this human interaction, gesturing cannot be seen independently from responding. Instead of a sender/receiver model to transfer 'already existing thoughts', Stacey (2007) argues how we change our own intentions constantly and that novelty is created in the interplay with others' intentions. In entrepreneurship education, this means that educators do not simply transfer knowledge and ideas in the process of new venture creation. Instead, educators and students create ideas about understanding the process of business proposition development in interactions in gesturing and responding to each other.

An organization (a new venture) that develops the business proposition, does not exist as a system with the only goal to develop the business proposition, but rather as the sum of local interactions. It is in the sum of local interactions that the business proposition emerges. This view on new ventures has implications for educators and coaches. As Stacey and Griffin (2005) claim, "*no one can step outside of their interaction with others,*" and thus the role of entrepreneurial educators and coaches becomes a rather paradoxical one. Coaches are 'officially' not part of the new ventures that are created by the students. At the same time they do become part of the interactions during coaching sessions with students, and thus, coaches are part of the new venture at that very moment. Stacey (2015) would argue for the creation of meaning in local interaction that allows the organisation (the new venture) to move forward. In summary, understanding an organisation through the notion of complex responsive processes means that the focus is on how individuals in interaction and in response to each other shape an organisation. The organisation does not exist as 'a system' but

is shaped through the interaction between actors, is local in nature, is continuously iterative and occurs in the living present.

The approach of making sense of complex responsive processes relates to interaction analysis (Section 3.4). In interaction analysis, researchers take the approach of analysis, mostly video recordings of the interactive processes. Interaction analysis knows a long tradition (e.g. Bales, 1950; Hutchby, 2008). Most of the work in conversation analysis focuses, however, on an objective point of view. The researcher analyses videos or transcripts from interactions, and based on coding, creates several research themes. Stacey's work explicitly allows for taking the experience of the researcher seriously, since the researcher has a unique position to be part of the social interaction. Stacey (2007) mentions 'striking moment'; these moments appear when the interactions between actors turns out to happen in a different way than the theory would describe. In the context of this thesis: striking moments might occur when entrepreneurship theory is not completely able to describe what happens in the social process of the business proposition development process. Once the researcher has identified these striking moments, Flyvbjerg (2001) suggests to 'let the data speak'. By analysing the video, a researcher can provide a rich description of what happened in the local interaction that a researcher experienced as striking.

Similar to the first study, the second study will aim to observe, understand and explain how entrepreneurs (and entrepreneurial educators) are involved. (The focus will be less on explaining). Chapter 3 illustrated how designerly thinking has a longer and richer tradition than design as social process. Therefore, it seems unlikely that the second study will come up with findings that can already fully explain how design as a social process has a role in the business proposition development process.

Chapter 6 describes how the sense making method is used in the context of this specific study.

4.5 Autoethnography

Autoethnography derives from ethnography. Ethnography research takes place in the frame of anthropological research, in which researchers describe people and their culture or practice (Wolcott, 1999). Ethnographic research has two main components. First, researchers *observe* and *interact with* people and their culture, and provide deep descriptions and understanding of this culture (Hammersley & Atkinson, 2007). Second, ethnography researchers take a distant stance on the people and culture they study to make sense of the observations and interactions. At the same time, researchers constantly rethink their own interpretation of the empirical material with the aim to create a deeper understanding of the cultural practice or phenomenon (Wolcott, 1999). In recent years, ethnographic research expanded towards autoethnography (Adams et al. 2014). Ellis and Bochner (2000) define autoethnography as *"autobiographies that self-consciously explore the interplay of the introspective, personally engaged self with cultural descriptions mediated through language, history, and ethnographic explanation" (*p. 742). Chang (2008) describes how autoethnography is ethnographical and autobiographical at the same time, where the ethnographical part is on purpose named first to highlight the similarities, namely deeper cultural and social understanding. Furthermore, Chang (2008) puts emphasis on the link between "the self and the social" in autoethnographic writing; to link between the cultural understanding to a researcher's self-understanding.

Similar as in the methodology of ethnographic research, the researcher observes the culture, interacts with the culture, is engaged in asking questions and re-frames his own interpretation of the

empirical data. In autoethnographic research the observations focus primarily on the researcher's own culture. In the methodology of doing autoethnographic research, Chang (2013) builds on Clandinin and Connelly (2000) who introduced the term 'field text' when talking about data. A field text is a researcher's recollection and reflection of events. That these data come from the memory of the researchers has both positive and negative aspects according to Chang (2008). On the positive side, the researcher can in a field text express the deepness of the own experience that by no other method can be captured. On the negative side, the memory selects, shapes, limits and distorts (Chang 2008, p.5). But by composing and recomposing field texts, researchers become aware of the limits of their memory. The final field text, after numerous iterations, is what Clandinin and Connelly (2000) call a '*schematic landscape outline*'. They explain that the field texts *'help fill in the richness, nuance, and complexity of the landscape, returning the reflecting research to a richer more complex, and puzzling landscape than memory alone is likely to construct"* (p. 83). These field texts can then be turned into an autoethnographic piece, in which the researcher connects the field texts to theory. The steps of data collection (composing field texts), data analyses and interpretation are not always sequential in autoethnographic research. Wolcott (2004) suggests to start already in the stage of data collection (writing the field texts) to connect to theory and write the autoethnographic texts as well. This process will stimulate and help the researcher to organize the future collection of data. For the structure of the final text, it is useful to present the autoethnographic texts and the literature related to the text simultaneously. In in more traditional articles, first the literature overview is provided, and only then the data and the discussion of the data is presented. The autoethnographic texts will inform which literature to use, and the literature will be input for new autoethnographic writings (Chang, 2008).

Chang (2008) explains how Van Maanen (1988) created a classification of three kinds of ethnographic writings, and that these classifications are useful in understanding autoethnography writings as well. First, van Maanen (1988) mentions the 'realistic tales', in which the writer writes as precise as possible an account of what happened. Of course, the account is coloured by the observation of the writer, but the value of these texts is to provide a clear and overall understanding of the social or cultural context.

Second, there are 'confessional tales'. The focus here is not so much on a detailed description but rather to describe how, for example, personal biases, character flaws or bad habits from the writers influenced the cultural and social process. Van Maanen states how the writer takes a stance that can be 'embarrassing', and that a confessional tale can be like a confession of the writer.

Third, there are 'impressionist tales', which highlight rare and memorable moments in the process of doing fieldwork. The focus here is on 'the moment' that is interesting. The writer feels in the cultural and social context that something is going on that is worth exploring in more detail. Impressionist tales differ from confessional tales by having more emphasis on the social context than on the personality of the writer.

Summarizing the classifications, Van Maanen describes that realist tales focus on 'the done', confessional tales focus on 'the doer' and impressionist tales focus on 'the doing of fieldwork' (p.102). In autoethnographic research, this means that a researcher can choose to provide a detailed description of what happened, go deeper into the motives, biases, embarrassing moments the researcher experienced, and/or describe rare and memorable moments in their own process. This is on purpose 'and/or' since in practice autoethnographers will notice that the three approaches will be interwoven.

For both confessional and impressionist tales, the approach of Brinkmann (2012) is useful. Brinkmann (2012) talks about 'stumbled data' on which reflections are written. A researcher will 'stumble' on an interesting situation that is different from what one would expect. By writing a narrative, the researcher will start to make sense of what was interesting about that situation. By writing, rewriting and connecting these writings to theoretical constructs, the (true) meaning of the autoethnographic piece will become clear.

Stacey (2007) takes a similar approach as Brinkmann (2012), which he calls complex process of relating (see section 4.3). For writing texts, this means that the author relates his experiences to the social context he/she is finding him/herself in. Stacey suggests to describe this social process and put emphasis on how new meaning emerges in paradoxical ways.

Flyvbjerg (2001) describes how researchers can also collect their data through interviews or observations instead of only in field texts. These interviews and observations should then function as a starting point to connect to the researcher's own experience of the event of interviewing or observing. The data collected by the researcher are a way for the researcher to allow him/herself to start to write an autoethnographic text. In this approach, the text will begin as a realistic tale and based on the reflections of the researcher could develop into confessional or impressionist tales.

By writing the in-depth narratives, it is the aim of the third study to observe and describe how the findings from the first two studies function in the overall process of the business proposition development process. By following the guidelines of Van Maanen and Flyvbjerg, the researcher critically reflects of findings in previous studies, where more objective research methods were used. For this thesis, it means that I, as a researcher, have the opportunity to see if and how the usage of a combination of embedded designerly thinking and designing as

a social process influence the overall process. The core strength of autoethnography as a method is that it provides these deep observations and understandings. Chapter 7 describes how the method is used in the context of the specific study.

4.6 Summary of the Research Methodology

Table 4.1 summarizes the three research methodologies discussed in this chapter. This discussion illustrated how a range of qualitative methods provide different kinds of new insights. The different research methods combined will provide an in-depth understanding on how both designerly thinking and design as a social process play a role in the business proposition development process. The upcoming chapters will provide the content for the studies, connected to the different methods.

	Interviews and Coding	**Sense making in complex responsive processes**	**Autoethnography**
Applied in chapter	Chapter 5	Chapter 6	Chapter 7
Main Authors	Eisenhardt, Yin, Glaser and Strauss	Stacey, Griffin, Shaw	Chang, Flyvbjerg, van Maanen, Brinkmann
Unit of Analysis	The activities of the entrepreneur	The interaction between entrepreneurial students and educators (the researcher)	The activities of the researcher and the interactions of the researcher with others
Level of the researcher's involvement	Low	Medium	High
The 'design lens' used	IDER activities and Designerly Thinking	Quality of Conversation in Participatory Innovation	The design lens will unfold throughout the writing of autoethnographic texts

Table 4.1: Overview and implications of the methods used in the three empirical studies

The insights of this chapter made the structure of this thesis more clear and detailed (Figure 4.5 on the next page). To explore the view of designerly thinking I will use the methodology of interviews and

coding in the first study (chapter 5). To explore the view of design as a social process, I will use the methodology of sense making in complex responsive processes in the second study (chapter 6). Finally, I will explore both the designerly thinking view and the view of design as a social process simultaneously in the third study (chapter 7) using autoethnography as a method. The method sections of each of these chapters explains how the different methods were applied in the context of that study.

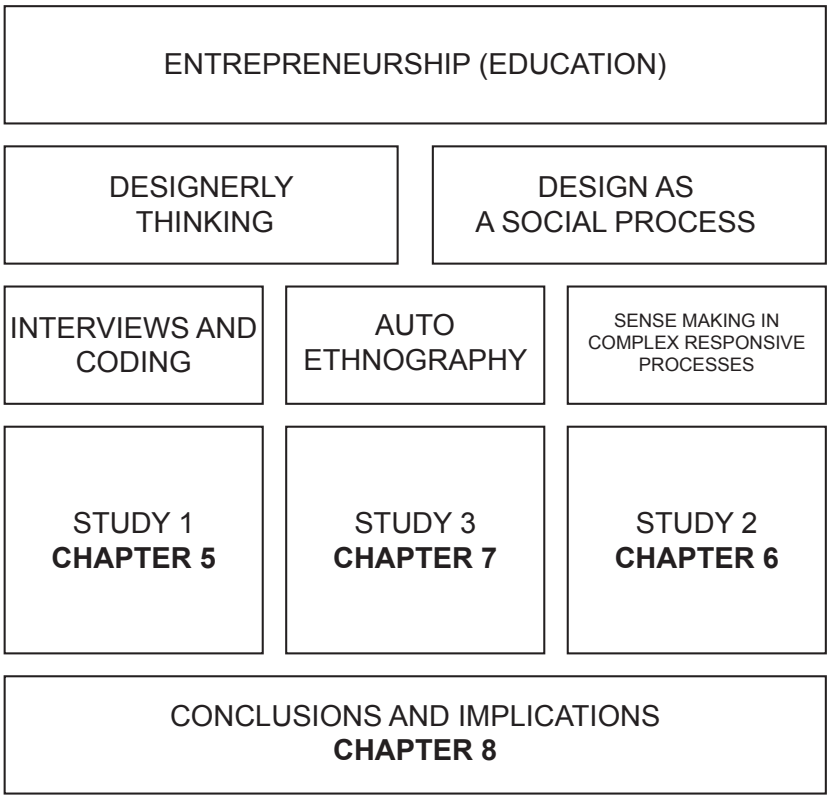

Figure 4.5: The research methods filled out in the structure of this thesis.

This chapter is an adaptation of

Van Oorschot, R., Smulders, F., & Hultink, E. J. (2016). Business Proposition Development in new Ventures as a Process of Initiation, Design, Engineering and Realization (IDER). In Proceedings of the *European Conference on Innovation and Entrepreneurship* (p. 853-865).

Van Oorschot, R., Smulders, F., (2014) The emerging of hi-tech new ventures described though a lens of design theory. In Proceedings of the Proceedings of the 13th CINet Conference, Budapest, Hungary (p 727 - 738)

Don't stop
Move it, baby
Wiggle, wiggle

Don't Stop, The Outhere Brother, 1994

5. Study 1: Business proposition development as Initiating, Designing, Engineering and Realizing (IDER)

This study explores how entrepreneurs use designerly thinking as an embedded activity in developing the business proposition of their new high-tech venture. Section 3.5 defined how designerly thinking activities are embedded in the IDER model, which described how initiating, designing, engineering and realising activities take places simultaneously. This study uses the IDER-model as a lens to identify how designerly thinking has an embedded role throughout the entire business proposition development process (Table 5.1, next page).

	Design Process Designing	Embedded Design process Designing
Design(erly) Thinking 	**Wicked Problems and Reflective Practice**	**The IDER Model**
Design as a Social Process 	Design Discourse	Quality of Conversation in Participatory Innovation

Table 5.1: This present study investigates how entrepreneur use designerly thinking as embedded activity, using the IDER model as a research lens.

The unit of analysis for this study are the activities of the entrepreneurs. The aim is to explore how entrepreneurs in new high-tech ventures use designerly thinking as an embedded activity throughout the process, so that these findings can be translated to what students should learn to apply during their 'educating through entrepreneurship' (Nielsen and Gartner, 2017). In summary, this chapter answers research questions 4:

RQ 4: how do entrepreneurs use designerly thinking as an embedded activity in the business proposition development process?

5.1. Pre-study

In line with the approach of this thesis, the scope and approach for this study developed in a designerly thinking way, where both problem and solution space unfolded simultaneously. In chapter 3, the IDER model was presented as a promising model to capture the designerly

thinking activities as embedded activities throughout the business proposition development process. Smulders et al. (2014) described how initiating, designing, engineering and realising activities take place simultaneously, but also how the ratio of these activities changes over time (Figure 5.1).

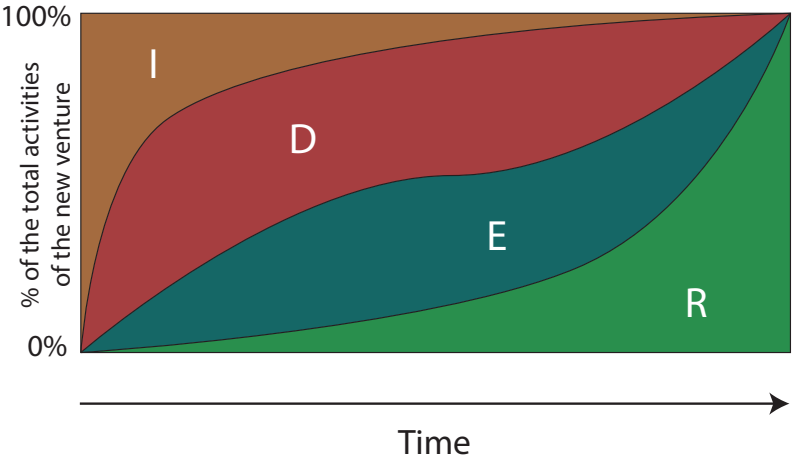

Figure 5.1: The visual representation of the IDER model (Based on Smulders (2014))

In the visualisation in Figure 5.1, the ratio across the four activities changes smoothly over time. From the literature overview in Chapter two, it became clear that the entrepreneurial process is uncertain. Therefore, it seems unlikely that in the practice of business proposition development processes, the ratio between IDER activities changes as smoothly as theory describes.

This "struggle" became clearer after I read an interview that a researcher from the Delft University of Technology conducted with the founder of a new high-tech venture, as part of an early research project on the business proposition development process. The new venture developed a highly sophisticated technology for the offshore industry. The technology had to be engineered; but also 'designed' for

the right purpose, so that workers in the offshore industry could use the technology in their everyday working activities. This new high-tech venture started in the Delft incubator YES!Delft, and became well known and successful over the following years, so I could easily relate to their business proposition development process.

I decided to go through the interview transcript and use different colour markers to highlight when the entrepreneur mentioned, what Smulders (2014) called, Initiating, Designing, Engineering and Realising activities. By doing this, I developed an understanding that the entrepreneur of the new venture was following some kind of IDER logic, as described in the original work by Smulders (2014). From the interview, I distinguished different kinds of initiating, designing, engineering and realizing activities taking place simultaneously in the business proposition development process of this entrepreneur. However, I could also identify that the ratio between the IDER activities was not as smooth as described in the theoretical model. In the interview, the entrepreneur mentioned several times how he 'changed' activities. The ratio between activities did not evolve smoothly over time. The entrepreneur mentioned how he sometimes needed more design or engineering activities to create a better understanding about his business proposition. At other times, he was already involved in several 'realisation' activities, and then discovered that these activities were not leading to the right outcome yet, and he had to start new kind of I, D and/or E activities. Overall, the IDER activities of the new venture seemed more 'bumpy' and less smooth than the theory of Smulders (2014) would suggest. Smulders (2014) already suggested that "*for each project the relative contribution of the separate elements will be different, let alone unforeseen iterations that enforce a total reboot of the project or (too) late engineering design changes or product recalls once they are on the market.*" *(p822).* By carefully analysing the phrases of the interview that related to the business proposition development

process, I could create an IDER visualisation that described the business proposition development process of this particular new high-tech venture. The different IDER activities and the changes in the ratio between IDER activities were distinguishable from analysing the transcript of the interview. The temporal dimensions of the IDER activities were less clear. The entrepreneur described several changes in activities, but it was not always evident from the interview in which order activities took place, and how long the time between changes in activities was.

The founding entrepreneur of this new venture took part in an entrepreneurial course in 2005, during which he wrote a detailed report, including a planning on which activities he planned to undertake in order to develop his business proposition. By reading through his detailed planning, I was able to connect phrases of the interview to parts of the planning. This step provided a clearer timeframe. For example, the report would state how the entrepreneur would have to 'engineer' a specific part of the technology for six months, while the interview described how they worked for 'almost a year' on both redesigning and engineering that specific part of the business proposition. By linking the interview to the report, I could develop a visual representation of the IDER logic for this new venture (Figure 5.2).

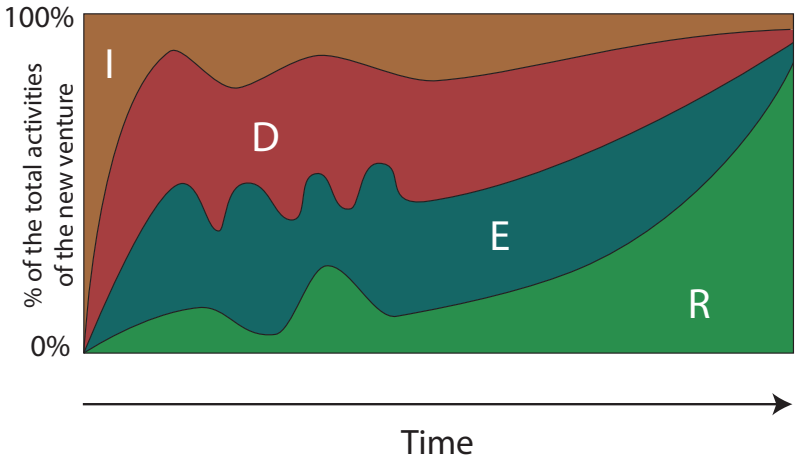

Figure 5.2: The IDER visualisation for the new venture working on offshore technology

The visualisation illustrates rapid changes in the ratio between Designing and Engineering activities early on in the process. Furthermore, the entrepreneur mentioned several times how he needed to initiate new parts of the business proposition later on in the process, resulting in several 'bumps' in the Initiation activities. Similarly there are some 'bumps' in realisation activities early on. Later on in the process, the realisation activities develop in line with the theory of Smulders et al. (2014), where the I, D and E activities become less prominent, and the R activities become more visible.

Developing the IDER visualisation for this new venture made me curious how the IDER models of other new high-tech ventures would look like. This new high-tech venture had been in business for ten years, and had expanded to more than 350 employees. It was no longer a 'new' venture. The interview with this new high-tech venture was part of a larger data set. The researcher had interviewed nine more entrepreneurs, and asked them the same questions about their business proposition development process. All interviews took place in 2010. The nine new high-tech ventures were still in the new venture phase in 2014. Following the same research method as above, it was possible to develop IDER visualisations for these nine new ventures as well. Furthermore, for these nine new ventures it was possible to interview the founding entrepreneurs again (in 2014). To better capture the temporal dimension of the IDER activities, and to ask these entrepreneurs again what kind of activities they were involved in 2010, and how these activities changed over time.

The research scope of this study unfolded in a 'designerly' way. The remainder of this chapter will describe in detail the setup of the main study, the method, the findings and the conclusions and implications of this study for entrepreneurial theory, practice and education.

5.2 Study Set-up

The main study consisted of two rounds of interviews with the founding entrepreneurs of nine new high-tech ventures. The two rounds were four years apart, in order to capture the temporal dimension of the business proposition development process. The first round of interviews took place in 2010 and were done by a researcher of the Delft University of Technology. The second round of interviews took place in 2014 and were conducted by the author of this thesis. During the first round of interviews, when the cases were selected, all cases were a starting new high-tech venture. All cases were selected from the business incubator YES!Delft (see section 2.5 for the description of YES!Delft). This scope was chosen because the new high-tech ventures in YES!Delft meet the incubator's selection criteria (technical feasibility, commercial feasibility and growth potential), and they all receive the same level of support from the incubator, which reduces the sources of extraneous variation. The selected new ventures were in different stages of the business proposition development process to capture the emergent character of this process. Hence, during the data collection in the first round, it was not known if the business proposition, and new venture, would become successful. In addition, the nine new high-tech ventures operate in different industries and their founders have different educational backgrounds, although all had an MSc-degree from the Delft University of Technology.

5.2.1 Description of the ten new high-tech ventures

Table 5.1 provides an overview of the ten new ventures. This table describes the technology and the complexity of the technology that the new venture is working on. Furthermore, it describes whether the new venture is a business-to-business, business to customer or business to business to customer kind of venture. The next two columns indicate the number of full-time employees (FTE) in 2010 and 2014. The last

columns indicate whether the new venture was still in the incubator in 2014.

	Technology	Complexity of Technology	Type of Business	FTE (2010)	FTE (2014)	In Incubator? (2014)
1	Offshore Co **(Pre-study)**	Very High	B2B	10-15	350	No
2	Social Network Co	Medium	B2C	5-10	<5	No
3	Smart Sensor Co	High	B2B	<5	Sold	No
4	Visuals Co	Medium	B2B	<5	10-20	Yes
5	Aerodynamic Co	High	B2B	5-10	10-20	No
6	Online Tool	Medium	B2B2C	<5	5-10	Yes
7	Transport Co	High	B2B	<5	5-10	Yes
8	Infrastructure Co	High	B2B	<5	5-10	Yes
9	Air Filtration	High	B2B&B2C	5-10	5-10	Yes
10	Air Co	High	B2B&B2C	<5	<5	No

Table 5.1: overview of the ten new high-tech ventures.

In the first round of interviews, the main question asked was: ***"How and by what activities did the business proposition evolve?"*** The entrepreneurs were asked to reflect on the activities they had undertaken so far to develop their business proposition, and to explain the activities they were working on at that moment, and which were planned for the next five years.

The second round of interviews asked the entrepreneurs to reflect on what they said during the first round of interviews. This was done by introducing quotes from the first round of interviews, stating what the entrepreneurs were planning to do, and asking the entrepreneurs how and by means of which activities these plans evolved or had changed over the past four years.

The data of both rounds of interviews were collected through face-to-face interviews with one of the founders of the new ventures. During the

interviews, the participants could elicit personal views and experiences regarding the creation of the new venture. The interviews were semi-structured to allow further investigation of issues that emerged from the conversation, or from the analysis of previously gathered data. The interviews of both rounds took approximately one hour each per interview. They were recorded with consent of the interviewee and transcribed later. Directly after the interview, field notes were written to capture the first impressions and analyses of the researcher. The transcribed interviews together with the field notes formed the dataset for further analysis. The total data set consists of over 22 hours of recordings and over 350 pages of transcribed text.

5.2.2 Coding the Transcripts and Creating IDER Visualisations

The two rounds of nine interviews were transcribed and then coded (Glaser, 1978) for I, D, E and R activities, based on the activities that Smulders (2014) describes as being typical for I, D, E and R activities; see Table 5.2 for an overview.

Initiating	**Designing**	**Engineering**	**Realizing**
Market research	Concept development	Validation	Purchasing
Ethnographic studies	Redefining the market need	Consolidation	Logistics
Brainstorming/ idea generation		Assembly	Production
		Detailed development	Sales
		Field test prototypes	

Table 5.2: The starting keywords for the IDER activities, used for coding the interviews

Throughout the coding process, activities were added to the Initiating, Designing, Engineering and Realizing categories and used for further coding of other interviews. The reason to expend the coding schema is that the original IDER model was developed with the aim to describe design and innovation processes. This present study investigates that entrepreneurs could use a similar logic, however the wordings that they use to describe their activities might not be the words that are common in the design and innovation literature. Therefore, this thesis develops a wider and deeper understanding on how the IDER model applies to the business related elements that an entrepreneur is facing in the process of developing a business proposition (See appendix A for the final version of the coding table).

The following is a lengthy quote from the first interview with the founder of new venture 6. It provides an example of how the coding was performed. For the coding, the following colours were used:

Initiating

Designing

Engineering

Realizing

After I just graduated, an important first step after that was to actually build a first version of the thing, to design a full-scale prototype, to build it and to test it on the public road. To prove it on the public road, so actually prove with a product that it saves fuel. That is an important step. Another important step was to start to build this network around you, so I started this working group (…) all kind of partners from the industry who all can give new input on how to improve aerodynamics of trucks. At the same time these partners help to quickly realize things, to have parts of it on the market immediately. Some partners could deliver materials for prototypes, a transport company could deliver some vehicles so we could test our product together with him. The next step was to find more partners who could help you to really think about how to position the product.

Textbox 5.1: Example of the different IDER activities, as coding in the transcriptions of the interviews.

The example illustrates how the new venture is engaged in several activities simultaneously and the initiating, designing, engineering and realizing activities are not only taking place in a sequential manner. The codes also allowed to identify which activities the new ventures did at which moment in time. The following text (on the next page) is an example of how the transcripts of the interviews allowed to identify which I, D, E and R activities happened on which moment in time.

Interviewer: [Researcher from the Delft University of Technology] interviewed you at the 1st of June 2010, almost four years ago. Back then you were still in the 'start-up' phase, I am mostly curious what kind of activities you have done from that moment onwards, and what kind of choices you made. But first, can you tell me, in your own words, what you were doing in 2010?

Interviewee: We were mainly testing our second prototype, with several launching customers. And we also launched our product, at the network event of YES!Delft, in early 2010. And then, during the spring, we did tests together with [party1], [party2], [party3]. These tests were successful, but also pointed out things that we still had to improve, so we did that. And then during the spring of 2011 we really started our sales as well. But also still a lot of product development, based on operational tests. The product is never perfect.

Interviewer: but from 2011, the testing phase for the project was over?

Interviewee: Well, actually not, we are still making technical improvements, and we are three years down the line now. There was still a lot of development needed at the backend. That took a year, also in combination with finishing my PhD. We kept on developing [the product]. And then, in the summer of 2011, we sat down with the three of us to discuss: what are we going to do now? We want to grow, and our own financial recourses are running out within the next year. What kind of strategy do we want to incorporate? That started the process to think more clearly about more collaboration. And those activities became more specific during late 2012, early 2013. We contacted several parties to investigate the possibilities to scale up, that was really a turning point.

Textbox 5.2: Example of an IDER coding that highlights the time aspect.

This example shows how in 2010, the new venture was mostly engaged in engineering and realising activities, and how by the summer of 2011, the entrepreneurs realised that they had to engage in more initiating and design activities, to get their business proposition ready for scaling up. For this study, it was especially important to capture the changes of activities; how does the balance of Initiating, Designing, Engineering

and Realizing activities change over time. It is important to state here that the IDER visualization may not be a 100 percent accurate visualization of the IDER activities of the new venture. Therefore, the amount of time the new ventures actually spend on the IDER activities might differ in reality. As well, the example in text box 5.2 illustrates that the detail of the time dimension is limited towards months; the activities are not described on a day to day basis. The importance is however to visualise the overall transitions (and changes) of IDER activities over time, and to capture how planned and unplanned, expected and unexpected activities take place. Chapter 4 described that the aim of this present study is to observe describe and understand. For the aim of this study to extend the knowledge on how business proposition development in new venture creation takes place it is important to describe overall patterns. It will be only in later research (which will predict and prescribe) that fully accurate visualisations are required.

5.3 Results

The following section presents the IDER visualisations for the business proposition development process for the ten new ventures. For the first new venture, there is an in-depth analysis of all moments in time in which the IDER activities changed. For the other new ventures, there are illustrative quotes with a description to clarify the IDER visualizations.

New Venture 2

The following text illustrates key moments in the business proposition development process of the entrepreneur of new venture 2. For all these moments, the key lines are marked for I, D, E and R activities. In the interviews, the entrepreneur explained at length all these instances. These explanations of the entrepreneur were coded for IDER activities. The following section will only illustrate the first instances in which the

entrepreneur introduced the change of activities.

The entrepreneur of new venture 2 describes the start of his new venture as follows: '*The first idea that we started with was the notion, the vision that if Internet would develop itself as it was doing at that moment, there would be a need for filtering, filtering the information. And this filtering had to happen, in my view, based on human insights […] then I met my business partner, who has a background in philosophy, and together we just philosophised about this notion of filtering. Lot of evenings, with lots of wine, ha ha, and just discussing what it meant. And sometimes trying to look at it from different perspectives, formulating it in different ways.*'

The first steps of the development seemed straightforward, as any business proposition development process would start; the entrepreneur is thinking about the first idea, and already have some activities in working with both the problem and solution, hence design activities, although they do not take up much of his time yet.

This first phase is followed by a short and intensive period of mostly designing the business proposition. New venture 2 engaged early on in several design activities in an attempt to quickly bring the business proposition to the market, without really developing the business proposition. As he describes it: '*What we should not have done in hindsight, is that we should not have connected the two ideas of filtering content on the one hand and having a communication tool on the other hand.*'

This part of the storyline is relevant. It seems that the entrepreneur just took the first opportunity to go from the initial idea ('something about filtering on the internet') to concept ('the connection of filtering to a communication tool'). After the concept development, there is a short focus on developing the engineering part of the business

proposition.

'We started with the idea that we could give some assignments to specialists so they could develop the digital environment for us, so based on that we could develop the core of our business. Quite quickly we acquired these two guys, took over their new venture, because we noticed that just by giving them tasks, we did not get the results we wanted. It was mainly based on our own inability to specify what we wanted, because we had not enough IT experience.'

This part illustrates that the entrepreneur realised his own inability to define the business proposition on a conceptual level, and thus rushed into acquiring two programmers, who could engineer the business proposition. From that moment on, it went quite fast for the new venture. Since they acquired the other company, they had to make money to survive. As the entrepreneur described: '*We did not have an organisation, like every new venture, we did not have enough knowledge and we did not have a market (but) we just had to make money and we were going to sell (our product)*'

Even though they realised that they should have spent more time on the design activities, they started to realise their business proposition, and spend significant amount of time on the realisation activities, while they were still trying to initiate, design and engineer the business proposition. The entrepreneur explained that this did not go well: '*Then after a couple of months it turned out that it was too difficult, our organization could not handle it, the sales*',

The new venture was doing sales of a business proposition that was not finished yet and even though they tried for a couple of months, they realised that more design and engineering was needed. '*We just visited ten different parties and we asked them if they experienced this problem, and we asked them if we would do this, this, and this if they would*

consider to become a customer. Based on these insights, we could make immediate changes in our coding. That was a good way of testing. That was very positive.'

After they decided to spend less time on realisation activities, their design and engineering activities started to become more integrated with each other. The design activities (talking to customers) were direct input for their engineering activities (changing the code), without a direct need to fully realise the business proposition. Through this interplay of activities, the entrepreneur discovered deeper insights, and could make conscious choices about what kind of engineering activities to engage in.

'A crucial point was that we could go along with the development of [software of a large IT company]. It was a great coincidence that exactly the right developments took place at that moment in time at [the large IT company] so we could join the ride. That was super.'

The business proposition is not developed based on the right kind of concept and also supported by the right kind of technology. This results in the development that more realisation activities are undertaken. '*We could sell about 100 of our platforms; around 1000 people were using it now.'*

However, quite quickly after the sales went up again, the large IT company they collaborated with, decided to pull the plug on the software that new venture 2 build their business proposition on. This forced the new venture to initiate, design, and engineer big parts of their business proposition from scratch. At the moment of the second interview, the entrepreneur reflects how he struggled for a long time to get to the new business proposition. *'we did not ask ourselves the question why [the large IT company] stopped developing their product, we only saw it as there is a new 'hole' now that we can fill up. That is the*

wrong kind of thought'

At the end of the second interview, the entrepreneur mentions that: '*We are now in a very practical phase; it is just building and then selling. We do not need many more new ideas. It is just pushing, pushing, pushing. And hopefully work toward standardization.*'

The entrepreneur explains that they still need to 'build' every product based on the specific requirements of the client. Their business proposition is partly defined as a platform that can handle the filtering of information, but there are still changes (in both design and engineering) in every project. They still aim to work towards standardisation, but they are not there yet.

From a timing-perspective, the IDER activities changed, during eight key moments:

(1) There is a first moment where the entrepreneur is mainly initiating the first idea of the business proposition.

(2) This is followed by an intense but short focus of designing in which two concepts are combined into a single business proposition.

(3) Then, this business proposition is quickly engineered (without well-defined design activities to back up the engineering activities) while already realization activities are employed as well, to get to the market as quickly as possible.

(4) The realisation activities are too much for the new venture to handle, and the new venture is forced to spend more time on engineering the business proposition (in interplay with design activities). This results in the discovery of an external software tool that they can use for their own engineering activities.

(5) Based on the new insights and development activities, they succeed

to ramp up their realisation activities again.

(6) The supplier of the external software platform pulls the plug on the software, which forces the new venture to initiate a large part of the business proposition from scratch.

(7) Over a long period, the new venture initiates a new business proposition, while still using the already build up designing, engineering and realisation capabilities.

(8) Finally, the new venture ends up with a business proposition that is context dependent and needs adjustments (by initiating, designing and engineering activities) depending on the different projects they do for different clients. They still aim to develop a business proposition that they can sell in the same way to a range of different clients.

These eight moments of changes in the IDER activities, allowed me to construct the IDER model as visualized in figure 5.3.

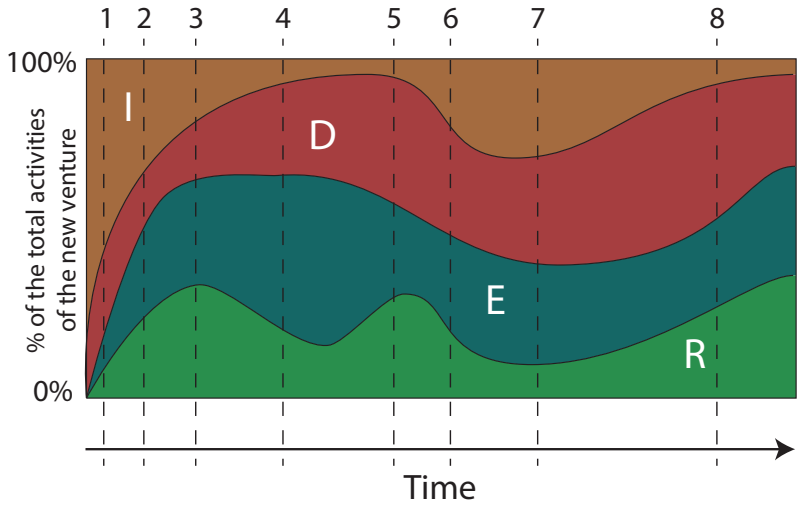

Figure 5.3: The different moments of change in the IDER activities for new venture 2

Without the time-markings, the IDER visualisation of new venture 2 is presented in Figure 5.4

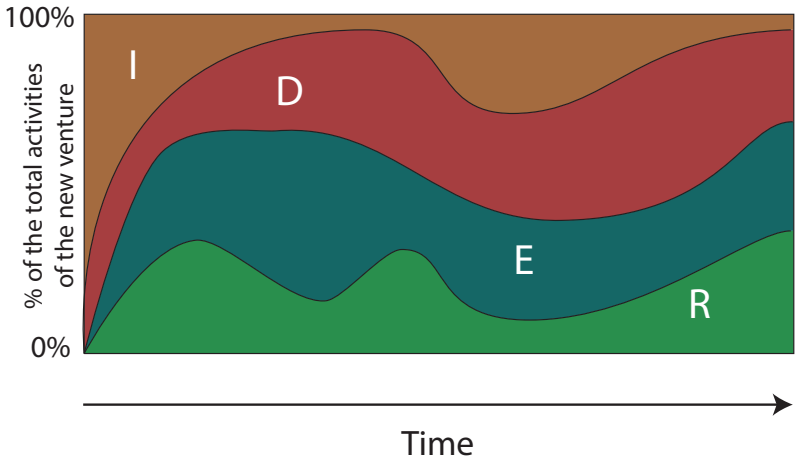

Figure 5.4: The IDER visualisation of new venture 2

Most remarkable for the IDER visualisation of this new venture is that it has two 'bumps' in the R activities. There is also a 'bump' in the I activities later on in the process. Overall, the IDER development of this new venture went less smooth than the theory of Smulders (2014) would describe. By constructing IDER visualisations for more new ventures, this study will explore if this 'bumpiness' is just specific for this new venture, or if it happens more often, or if other patterns occur. For the business proposition development processes of the other new ventures, the research process followed the same steps. The continuation of this section will present the IDER model for the other new high-tech ventures, and illustrate some key changes of IDER activities with quotes of the interviews.

New venture 3

New venture 3 uses advanced measuring technology for internal transport systems in hospitals. The technology that new venture 3 used is complicated, but the entrepreneurs were already familiar with the technology at the start of their business proposition development

process. Therefore, the challenge was to design the business proposition is such a way that their technological application was meaningful for one or more parties in the hospital; this required several design activities over a longer period of time.

New venture 3 developed all I, D, E and R activities in the beginning of the business proposition development process, and then, experienced that the business proposition needed more D activities. New venture 3 had to 'design' the business proposition to make it suitable for another segment within medical worlds. *'(that was) the real shift of the product, from a product-marketing venture to a product-market venture'*

In addition, new venture 3 needed more Initiation activities later in the process to make the scaling of the product in other European countries possible. At the moment of the second interview, new venture 3 focused mainly on their R activities. *'I am not sure if it is the goal right away, but at least my dream is to be able to sell the company so it can really scale up'*

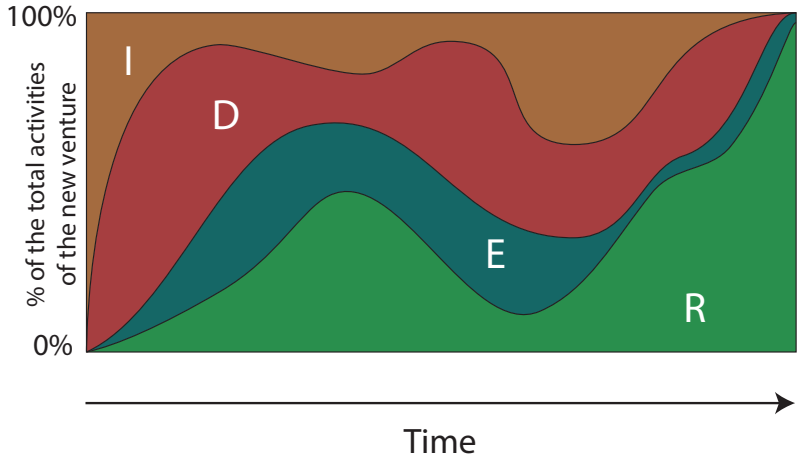

Figure 5.5: The IDER visualisation of new venture 3

The IDER visualisation of new venture 3 (Figure 5.5) shows similarities to the visualisation of new venture 2. Both illustrate 'bumps' in R-activities that are compensated by an increase of I, D and E activities. New venture 3 reaches full R-activities at the end of development, as the theory of Smulders (2014) describes.

New Venture 4

Two industrial design students initiated new venture 4. Their business proposition was an augmented reality table. They developed most technology and design skills to develop their augmented reality tool already during their Master of Science studies. Both entrepreneurs lacked however the business knowledge on how to bring a business proposition to the market. Therefore, new venture 4 went through two early 'ups and downs' in all IDER activities. *The technology is nice, but how can you clearly sell that to someone? (..) it evolved over a year, where you are first trying to sell the technology (..) and now we can sell it as a product.'* They sold a product, and with the feedback on the sold product they improved the next version of the product. After these early fluctuations, new venture 4 moderately engaged in more and more R activities. However, new venture 4 still Designs and Engineers their business proposition at the moment of the second interview because the new venture experiences that for every customer the business proposition needs to be slightly tweaked. *'we ourselves are working on the core business, the development of new tools, and together with partners we can put the product into the market.'*

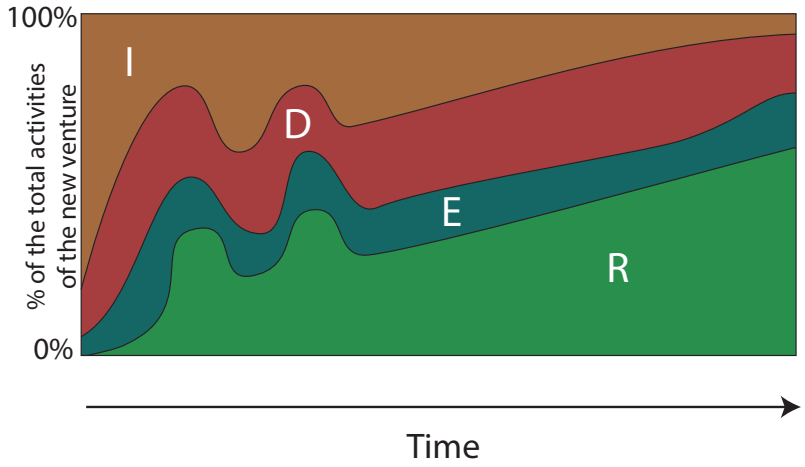

Figure 5.6: The IDER visualisation of new venture 4

The IDER visualisation of new venture 4 (Figure 5.6) illustrates two 'up and downs' between all IDER activities. Whereas venture 2 and 3 had bumps in the R-activities, this new venture had bumps in all IDER activities. In comparison to new ventures 2 and 3, the 'bumps' of this new venture seemed more 'planned' by the entrepreneurs.

New Venture 5

New venture 5 had an idea to create a new technology for the Formula 1 racing industry. New venture 5 went quickly thought all I, D, E activities and focused from the start on R activities. New venture 5 discovered, however, that the business proposition was not the right fit for the market, since the technology was not legally allowed in the racing market. They had to quit their original business proposition. *'Last year 60% to 70% of our activities were for the automotive market, that is back to 0% now'* New venture 5 went through several 'ups and down' over a long period to develop a new business proposition. At the moment of the second interview, the new ventures focused mainly on designing and engineering the business proposition, without having much opportunity to realize it. *'it is still hard, sometimes we just*

listen too well to our customers (..) and then we have a lot of costs and then we do not have the result that the customer wants. And then he is disappointed because he has spent a lot of money and it does not work. We would not want to do it in this way anymore.'

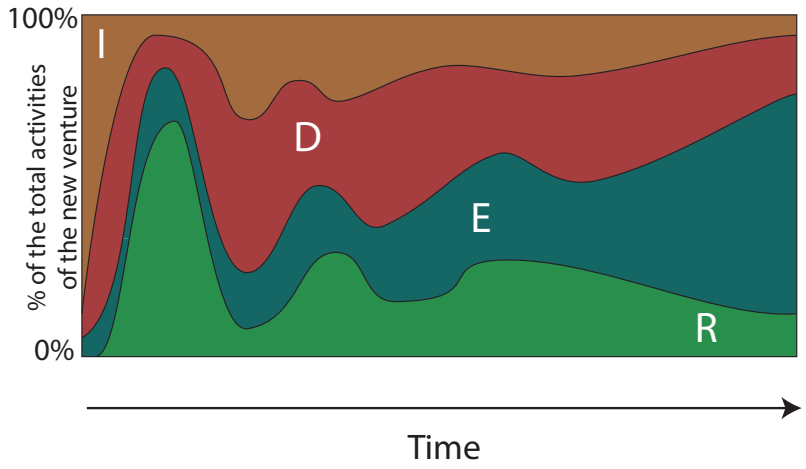

Figure 5.7: The IDER visualisation of new venture 5

The IDER visualisation of new venture 5 (Figure 5.7) illustrates (similar to new venture 2 and 3) several 'bumps' in R-activities. However, for new venture 5, the first 'bump' is more extreme than in the previous cases.

New Venture 6

New venture 6 was unique in the sense that the entrepreneurs had no fixed idea yet on what their business proposition was about at the moment that they decided to set up their new venture. Therefore, new venture 6 engaged at the start of the development process almost fulltime in Initiation activities with the aim to choose the right business proposition. '*We very consciously compared all our ideas and choose the most promising one. I think we are quite unique in that sense*' Out of these consideration, they chose to develop a business proposition around

the concept of online registration for events. After that choice, they engaged in relativity few E-activities, because they had the technological knowledge to develop an online tool with the matching algorithms and specific needs for the registration market available but the designing of business proposition needed more attention. *'We have learned over the last four years that the positioning in the market has a larger role than the feature our product has. We try to attract customers by having a certain kind of professionalism and not so much by the features of our product.'* At the moment of the second interview, new venture 6 dominantly focused on R-activities.

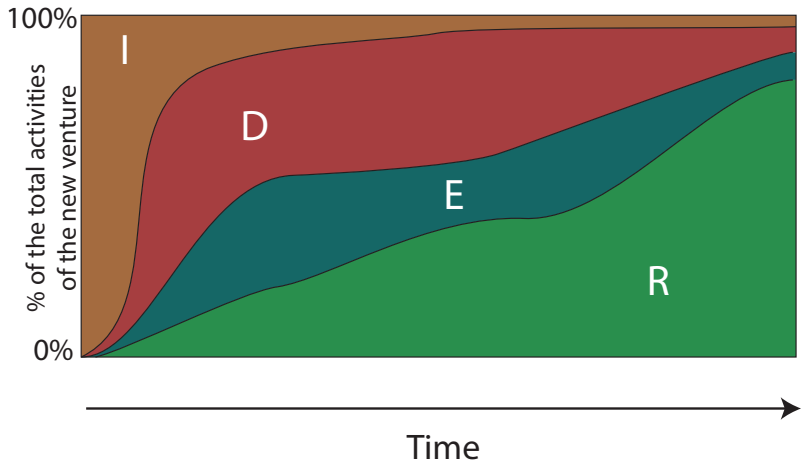

Figure 5.8: The IDER visualisation of new venture 6

The IDER visualisation of new venture 6 (Figure 5.8) followed the IDER models as originally described in its smooth form to the largest extent. It is the first new venture of this study that does so, which makes me wonder why that is the case. Before I analyse that, the other new ventures are presented first.

New Venture 7

New venture 7 worked on an aerodynamics application for trucks.

The technological knowledge was not readily available. Similar to the new venture in the pre-study (new venture 1), they had to build a full-scale prototype to test the technical assumptions of their business proposition. New venture 7 experienced several Designing and Engineering fluctuations in order to develop the business proposition. *'Every new technology first needs to prove itself. (...) you always get feedback. On mechanical elements, on practical elements, but also on what the product is actually about'*. These fluctuations assured that they could prove their technology, and simultaneously develop their aerodynamic application for the right clients in the market, since they got the needed financial support from potential customers. Later in the process, new venture 7 experienced an increase in I-activities because they wanted to scale up and sell their proposition across Europe. '*Yes, (the new clients) do not believe the results. They always need to see it themselves. That is frustrating but it is also understandable that they want to touch it and experience it themselves, be close to the real action. (..) So therefore, we had to set up an innovation program. We invite them to the test track, drive a couple of laps, and give them a test report. And then the sales people can start to do their job.*'

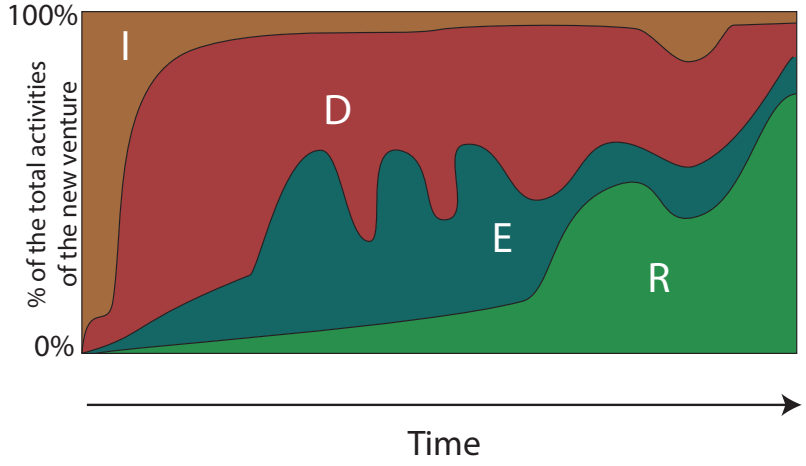

Figure 5.9: The IDER visualisation of new venture 7

The IDER visualisation of new venture 7 (Figure 5.9) is interesting because it illustrates several fluctuations. Similar to the new venture in the pre-study, there are fluctuations between the D and E activities that seemed to be planned by the entrepreneur. As well, there is a bump in R activities that was also appearing in several other new ventures.

New Venture 8

New venture 8 developed a system to measure vibrations and other variables in dikes. The system was also useful for other markets, so they would try to develop different business propositions for other market segments. They went through a steady IDER development process at first, to discover later that they were not working on the right business proposition. *'We noticed in the begin that you can do something that works a bit in five different markets, or works perfectly in one market; then it is more beneficial to focus on that, that is fitting to that one market.'* That is when they realised that they had to initiate more activities to come to one solid business proposition.

At the moment of the second interview, they engaged equally in all four IDER activities simultaneously to get the right business proposition. *'I think that (our focus) should be mainly on the research and development.'* The new venture did not manage to develop a single business proposition yet, but is still working on that.

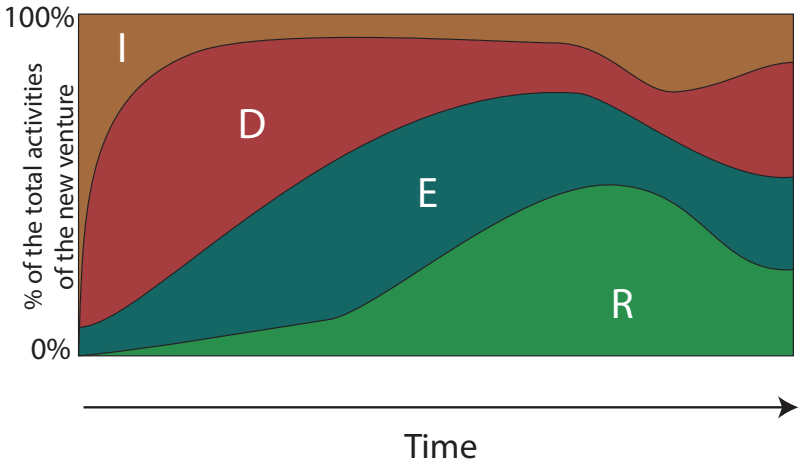

Figure 5.10: The IDER visualisation of new venture 8

The IDER visualisation of new venture 8 (Figure 5.10) has one big bump in the R activities, which seems to become a recurring pattern. Apart from that, the development goes rather smoothly.

New Venture 9

New venture 9 developed a system to purify air. The founder of new venture 9 already had extensive knowledge on both the engineering of this specific technology, and realisation of business propositions in general. It was still a challenge to design the business proposition so that it would fit user needs. The entrepreneur wanted to work together with several other parties, but this was not easy. *'It was very tricky and either way the reaction you will get is: work it out, make a prototype and then come back. Well hello, if I will have to do that on my own, then I do not need you, then I can just do it myself also afterwards. That was actually the first phase.*' New venture 9 was forced to develop Design activities early on in the process, which allowed them to accelerate their Engineering activities later on in the process. Thanks to the early design activities, they could easily ramp up to larger production. At the moment of the second interview, they predominantly focused on

Realizing activities. *'We are now at the moment that we just order 1,000 units per year, fine. Which batch do you want; every order is 200 units, fine. So, we make the order to our producers, they produce it and it gets out into the world.'*

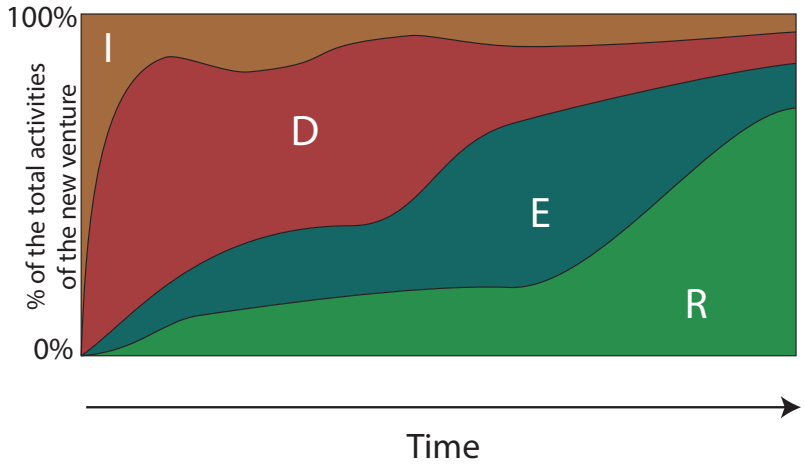

Figure 5.11: The IDER visualisation of new venture 9

The IDER visualisation of new venture 9 (Figure 5.11) does not show many fluctuations, and seems similar to the theoretically described IDER model. The 'weight' on D activities early on in the process is remarkable, and seems to be more than in the other new ventures.

New venture 10

New venture 10 developed a cooling system for beds in tropical climates. They followed the IDER logic until halfway their timeline by building up several IDER activities over time. *'It was nice, we made some first sketches and I could use my master graduation project for it. (…) we won some prize money here and there, got some subsidies, so we could actually develop a first working prototype. (..) and now we are at the beginning of the commercial phase. We have tests now in 20 showrooms.'* Then they experience they cannot fully realize the business proposition

on a larger scale, which results in the fact that they have to engage in all four IDER activities again. *'To really produce something in good quality and with good scalability and so on turned out to be really difficult. And we have hardly any experience in that. (…) It is mostly that you just do not realize that our product needs so much after service and normal service and installation and all kind of crap we did not think of.'* They misjudged that they had to sell and repair their products all over the world, while they were still situated in the Netherlands. Therefore, they had to initiate and design their core business proposition again, which they were still doing at the moment of the second interview.

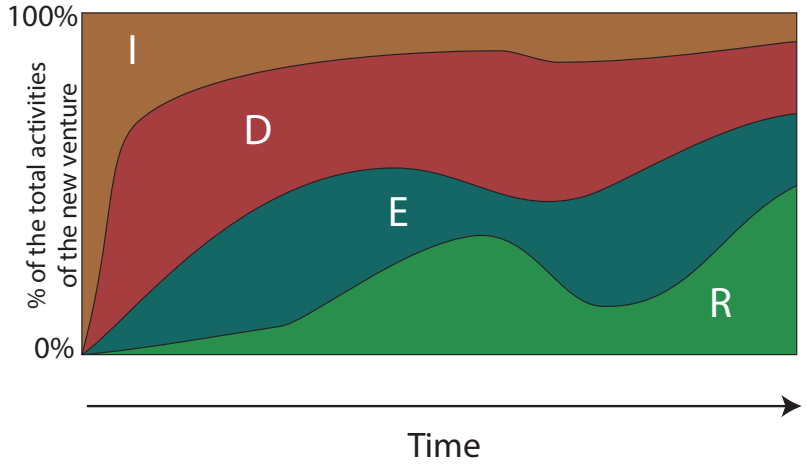

Figure 5.12: The IDER visualisation of new venture 10

The IDER visualisation of new venture 10 (Figure 5.12) illustrates (as for many other of the new ventures or this study) a bump in the R activities. What is also remarkable is that all four IDER activities seem to have the same weight throughout the whole development process.

5.4 Three IDER Patterns

By analysing the IDER visualisations of the ten new ventures, several recurring patterns that take place in multiple processes show themselves. The identification of these patterns was first visual, by the interpretation of the researcher; several IDER visualisations seemed similar. Going back to the interviews, I searched for quotes in the transcripts that explain why changes were taking place.

The following sections describe three patterns that are exemplary for the 10 new venture in the study, and seem to have broader implications for other new high-tech ventures. Every pattern offers a description how the IDER activities are specific for that pattern.

5.4.1 First Pattern: a smooth IDER

New ventures 6 and 9 follow the logic of the IDER model as described by Smulders (2014) to develop their business proposition. Interestingly, new ventures 6 and 9 are the ventures that are working on the least technological business proposition (Figure 5.13).

New venture 6 developed a software tool and the founders already knew what was needed to 'engineer' the tool. Some software engineering was required early on in the process, but after that a mix of Design, Engineering and Realization activities allowed the new venture to smoothly develop its business proposition. The entrepreneur behind new venture 6 described his activities as follows *'We don't need a lot of facilities for our venture. In fact, we mainly use a computer, which you also have at home, so that was not so difficult. And since we had the knowledge we could start making it right away and also try to start to sell it right away.'*

The founder of new venture 9 explained that her main expertise was in what we would call I and R activities, but she realized that concept development (D) and 'robustinising' activities (E) are essential at the

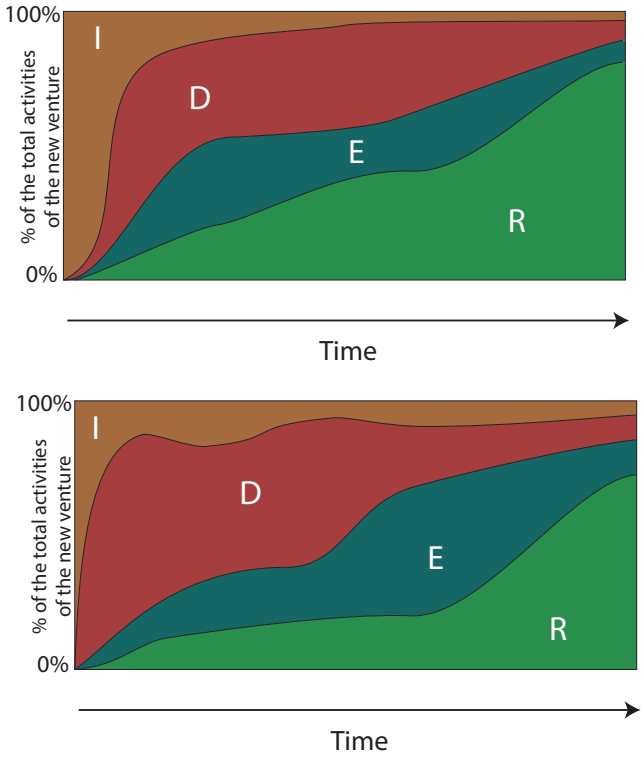

Figure 5.13: both new venture 6 (up) and 9 (down) follow a smooth IDER process

start of the new venture creation process. Hence, she decided to work with design interns and design graduation students who helped her to conceptualize her original ideas. Later in this process, her own expertise became more important in moving the business proposition from E to R activities. She describes: *'I am more a sales person, I see an opportunity and pick it up and sell it [...] I am not even allowed to get into our development lab anymore, ha ha. The guys will just say: get out! But it is good like this, I am the director, I am not in the lab, I am not working on development. But I do come up with new ideas every other day. I write down these concepts on the planning and then we see who of my guys can do this, and when they can do it.'*

The findings suggest that the entrepreneurs of these two new ventures

that follow such a smooth pattern are aware which of the I, D, E and/or R activities are easiest for them to engage in, but also of the necessity of other activities throughout the process. The main challenge for these new ventures is to create the conceptual frame (D activity): what is the exact value for the customer of this business proposition? Once the frame of their business proposition is created, the entrepreneurs have the skills and knowledge available to develop and robustinise the remaining parts of the new venture.

5.4.2 Second Pattern: D-E-(R) Wiggles

The second pattern consists of new ventures experiencing 'wiggles' among the D, E and R activities. The first of the two versions concern new venture 1 and new venture 7, that followed a D-E wiggle (see Figure 5.14). The second version as deployed by venture 4 is a D-E-R wiggle, thus including the R-activities.

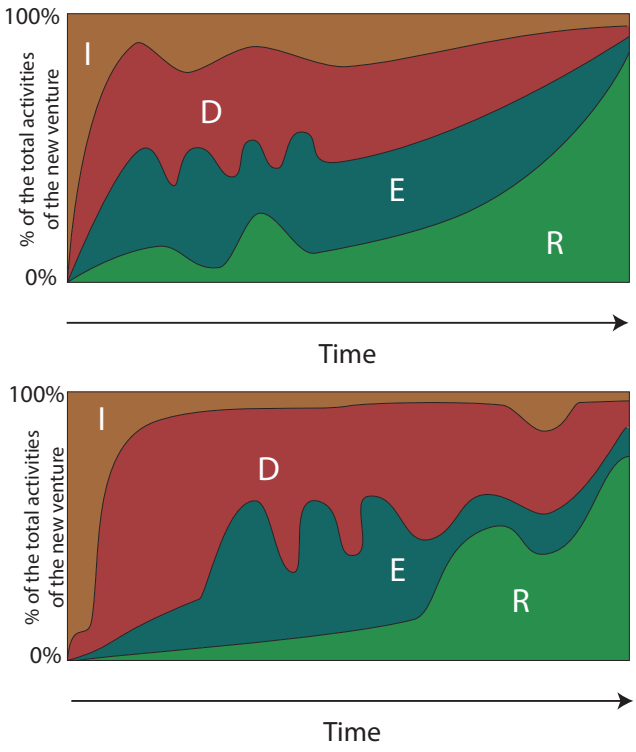

Figure 5.14: Wiggles in D and E activities of New Ventures 1 (up) and 7 (down)

Both ventures 1 and 7 work with complex technology and both entrepreneurs indicated that they needed to spend a lot of time on the engineering of their business proposition. Due to the complexity of their product, they could not apply readily available E-knowledge for engineering, and subsequent testing its 'robustness'. New ventures 1 and 7 chose to wiggle *intentionally.* Both entrepreneurs indicated that they did not expect to fully engineer their business proposition at once. The E activities were employed as new input for their D activities. The entrepreneur of new venture 6 mentioned: *'That is also why we worked with several test partners to make prototypes and to make clear that this is really a testing period to explore how to work with the product.'*

Furthermore, the entrepreneurs explain that these 'wiggles' are possible because both new ventures 1 and 7 collaborate with industrial partners who were willing to (partly) finance these Design and Engineering activities. The entrepreneur of new venture 7 claimed: *'To build prototype 2 was an enormous financial investment, and the results only come afterwards. During this period, we had to keep the venture as financially healthy as possible, so that we could still scale later on.'*

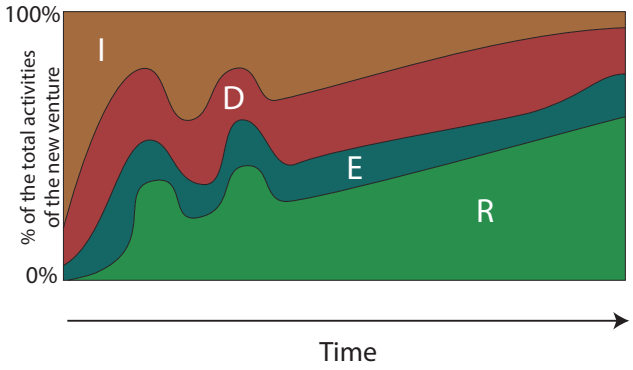

Figure 5.15: New Venture 4 engages in Wiggle Activities of D, E and R activities

New venture 4 went through a *D-E-R Wiggle* (See Figure 5.15). The entrepreneur indicated that he consciously conceptualized, engineered and produced his product, not with the intention to produce this product in large quantities but to learn from selling the product as input for a new cycle of Design activities. The entrepreneur of new venture 4 stated: *'First we sell, then we develop. And only then we put in our own money to develop things.'* This approach worked well for new venture 4 since its technology was relatively easy and allowed the company to sell 'beta versions' of their product in which the technology had not been completely developed yet. Customers were still willing to pay for the products. New venture 4 shows the benefits of working with minimal viable products (Ries, 2011) as an effective means to robustinise the business concept before large investments are needed to fully realize the new venture.

New ventures 1, 4 and 7 realized that both the D and E (and R activities for new venture 4) activities run over the whole business proposition development process. However, rather than creating a conceptual frame, they needed to develop their knowledge and activities throughout the process. By *wiggling* with their activities, the entrepreneurs build up their knowledge and experience, which allows them to succeed in Realising and selling their business proposition in the end.

5.4.3 Third Pattern: The R drop

The final pattern that we identified (and which concerns the majority of the cases) visualizes the challenging nature of the business proposition development process. Five new ventures (2, 3, 5, 8, and 10) experienced what I would call an '*R drop*'. Whereas the entrepreneur of new venture 4 explained that he engaged in early R activities (in the *D-E-R wiggle*) with the aim of learning, the R drop illustrates that while new ventures thought that they could start to work towards full R activities, they were forced to engage in additional I, D and/or E activities, which they did not foresee (Figure 5.16).

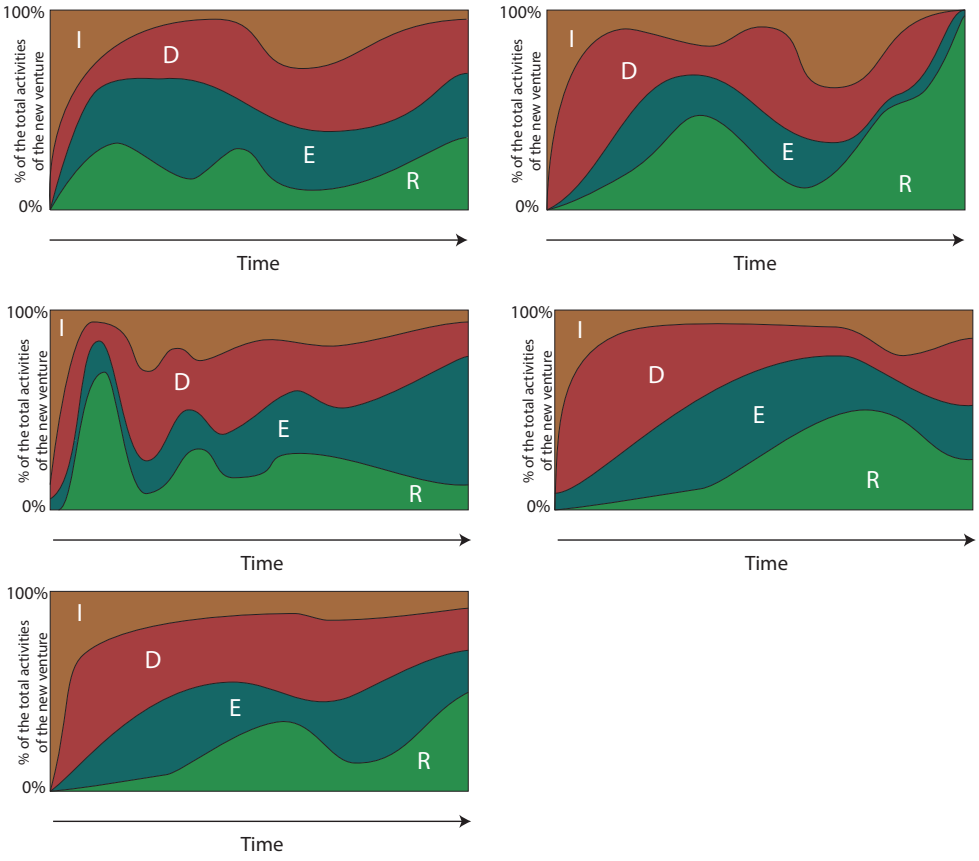

Figure 5.16: New ventures 2 (upper left), 3 (upper right), 5 (middel left), 8 (middel right), and 10 (down) go through an R drop at some point in their business proposition development

R drops have serious implications since R activities are expensive. For instance, new venture 5 (the first figure on the second row in figure 5.16) developed a fully functioning product for a client in the automotive industry, to later discover that this product was not legally allowed in its present form in that market. He explained: '*We built a prototype right away and also tested [it] on track. This went very fast. With that prototype, we went to all factories in the market and we also had a business plan saying that we would make a lot of money already in the first year. After we contacted one specific factory we discovered that*

this technology was not allowed. [Our technology was in] the grey zone, the wrong side of the grey zone. That was that. What were we going to do next?' The new venture was forced to engage in new I, D and E activities to develop a new business proposition that would both fulfil market needs and comply with legislation.

New venture 8 experienced an R drop later on in the process, discovering that it had to spend a great deal of time on client aftercare. This entrepreneur explained: *'I think that at some point this was taking up 80% of our time. That means that you cannot spend time on development anymore and that you cannot go deeper into the market. At some point, you are operating at full capacity and you notice that it is not fully profitable yet, so something is wrong in your model.'* The entrepreneur of new venture 8 then had to engage in new I activities and find new approaches to focus more on development activities for future projects and outsource the aftercare.

All five new ventures experienced an R drop because they misjudged the technology, the business proposition, or the market. By spending too little Initiation, Design and Engineering to come up with a viable business concept to be 'robustised', these misjudgements only became clear once the ventures started to Realize their business proposition. In comparison, D-E-(R) wiggles are most often *intentional:* the entrepreneurs seek to learn from deliberate development activities to make adjustments in the next set of activities. R drops are a kind of wiggle as well, but are *unintended* by the entrepreneurs. The new ventures that experienced an R drop had expected to follow the first pattern of the theoretical IDER, and the wiggle came as an unpleasant surprise.

The five new ventures following this pattern are of different sizes, and work on different kinds of technologies in different business segments. Therefore, it seems to be a problem that is encountered by a wide variety

of new ventures that have not validated their business proposition sufficiently before development and realization, and thereby wasting scarce resources. Hidden or latent market need necessitate deliberate development activities to test and enrich the propositional ideas with extra attributes.

5.5 Designerly Thinking as an Embedded Activity

The previous section investigated different patterns in IDER activities. This section highlights the design activities within these patterns. The analysis of the 10 new ventures illustrates that business propositions can be understood as a wicked problem (Buchanan, 1992), especially in the context of new high-tech ventures. New high-tech ventures are developing the proposition, the technical knowledge, the network of collaborators, the knowledge about the business proposition, and other aspects, simultaneously. The complexity of this context requires to constantly redefine both the problem and solution throughout the business proposition development process. Designerly thinking in relation to wicked problem solving is not just a phase within the whole process, but the business proposition stays 'wicked' throughout the whole process, until the proposition is ready for full realisation, which is almost always later than the entrepreneurs expect.

The ten cases also illustrate that describing the business proposition development activities only in terms of designerly thinking activities is too narrow. Designerly Thinking activities should be understood in their relation to other activities. The R-drop pattern is the clearest example; for all new ventures where an R-drop happened, the entrepreneurs engaged heavily in design activities before the moment of the R-drop. They considered the wickedness of their problem, and they were reflecting on their practice (Schön, 1983) of developing the business proposition. The issue, however, was that the entrepreneurs

did not continue their reflective activities over a long period of time. The entrepreneurs experiencing an R-drop decide too quickly that their business proposition was 'developed enough' to go forward toward realisation. In these situations, there is an increase in E and R activities and a decrease in D activities, which indicates that the entrepreneurs become more systematic and output focused and less reflective in approaching their activities.

The Wiggle pattern illustrates that an increase in E and R activities does always mean that the entrepreneur stops to reflect on the development of the business proposition. Here, E and R activities are used as input to be reflective again (engage in D activities) later in the process. The wiggle patterns use the reflective notion of design in the best embedded way in IDER activities.

Whereas chapter 3.2 illustrated that design thinking focuses on the *translation of* designerly thinking to other applications (strategy, new product development, business development and so on), the notion of designerly thinking in business proposition development processes focuses on *the relation* with other applications. Entrepreneurs cannot just use designerly thinking on the business proposition and then pass on the business propositions to others, who are responsible for engineering and realizing the business proposition. The entrepreneur is responsible for all IDER activities, and thus the challenge is for entrepreneurs to get the relation between design and other kind of activities right.

5.6 Conclusions and Implications

The three patterns found in this study have different implications for the start of new ventures and for educating the business proposition development process to entrepreneurial students. Entrepreneurs of new high-tech ventures could make more conscious decisions on what kinds of IDER patterns, and therefore what kind of design activities, they could follow if they want to prevent a costly and time-consuming R-drop experience.

When a new venture develops a business proposition, the advantage of following a smooth IDER is that the development process will be with less unexpected activities. In such cases, the venture has a viable business concept and draws on readily available knowledge to develop it. When the venture needs to develop new knowledge to build up the business proposition, a Wiggle IDER process seems more appropriate to test and iterate between D, E and R activities. However, entrepreneurs must keep in mind that a Wiggle IDER process takes time and requires a financial investment that will not guarantee an immediate return.

In following both the smooth IDER and the Wiggle IDER process, there is always the threat that the new venture will experience an R drop. In such situations, entrepreneurs often think that they can fully focus on E and R activities, but come to the realization that more I and D activities are needed. Table 5.3 (next page) summarises the advantages and requirements for the Smooth and Wiggle IDER and illustrates that in both cases there is always the threat of an R-drop.

	Smooth IDER	**Wiggle IDER**
Advantages	Smooth development with little change in activities.	Wiggles are a way to test the business proposition with the aim to improve its quality.
Requirements	The new ventures need to have readily available proposition knowledge and skills.	Wiggles require a financial investment and/or longer time spans with no immediate financial return.
Possible threat	**R drop** R drops appear as an unintended wiggle in which the new venture is forced to engage in new I, D and/or E activities that were unforeseen.	

Table 5.3: The advantages and disadvantages of the Smooth and Wiggle IDER. For both patterns there is always the threat of the R drop.

The data set is too small to predict and prescribe in which context and under which circumstances entrepreneurs of new high-tech ventures should follow a smooth or wiggle IDER and when the threat of an R-drop can occur. However, some first insights can be provided. It seems that especially new ventures working on very high-tech business proposition, need to wiggle often before they get to the correct business proposition in which technological requirements and market needs come together. Interestingly, the wiggle cycles seem to happen quickly after each other. A single wiggle is not performed to immediate gain all knowledge needed to ramp up the R activities, but a single wiggle always informs the activities of a next wiggle. A minimum of three full D-E wiggle seems to be required to develop the knowledge required to ramp up the R activities. Entrepreneurs could pay attention to this in making a mid and long-term planning for their business proposition development.

Similarly, first recommendations can be given for the smooth IDER

pattern. It seems that new ventures that have the required technical knowledge available to develop the business proposition, can follow a smooth IDER pattern. The focus of their design activities is to determine the value for the customer of the business proposition. This is still a challenging task in which entrepreneurs have to define and redefine their business proposition constantly. However, since the technical knowledge is known by the entrepreneur, insights gained during customer engagement can be engineered almost simultaneously.

The threat of an R-drop does not seem to be related to the kind of technology the new venture is working on, since R-drops occur in a variety of companies. Furthermore R-drops occur at different stages in the process. However, an R-drop always seems to be a result of a lack of design activities with the aim to define, test and redefine the business proposition. The realisation that R-drops occur throughout the whole process stresses the importance of design activities throughout the whole development process. Even though no definite recommendations can be given on how to avoid R-drop, the main advice for entrepreneurs is to keep redefining their business propositions throughout the whole process. Entrepreneurs need to realise that to ensure the success of a business proposition and the new venture, it is necessary to engage in both Initiation and Design activities until the end of the process, and until there is an optimal and validated fit between the proposition offered and a real market need.

Overall, the findings of this study are a first step in exploring how design(erly) thinking can complement the process of developing a business proposition in entrepreneurship education. The IDER patterns illustrate that design activities are always embedded. In the different patterns, design activities complement the overall activities in various ways. Smulders (2014) introduced the IDER model, and defined the I, D, E and R activities. This present chapter defined in more detail the

I, D, E and R activities (see appendix A). The detailed descriptions of these IDER activities allow to be more precise about how entrepreneurs in new high-tech ventures use the embedded design activities in the overall business proposition development process. The findings in this study illustrate that design activities have different functions in different IDER patterns. Whereas Smulders (2014) describes design activities in line with the work of Dorst (2014) on frame creation, this first study illustrates the value of design activities is more nuanced than merely frame creation. In the smooth IDER pattern, design activities focus on determining the value for the customer of the business proposition, while in the wiggle IDER pattern design activities focus on the interplay between customer requirements and technology development. In the process of business proposition development for new high tech ventures, 'designing' is not just 'creativity' or 'a tool box' but an activity that runs throughout the whole process in which it has several embedded functions.

This chapter is an adaptation of:

Van Oorschot, R., Smulders, F. & Hultink, E.J. (2017) Qualities of Entrepreneurial Design Conversations. In E. Bohemia, C. de Bont, & L. S. Holm (Eds.), Conference Proceedings of the Design Management Academy (Vol. 5, pp. 1577–1593). London: Design Management Academy.

Van Oorschot, R., Smulders, F., & Hultink, E.J. (2016) Quality of Conversation in Coaching New Ventures. Proceedings from the 17th CINet conference (518-529)

Your great mistake is to act the drama
as if you were alone. As if life
were a progressive and cunning crime
with no witness to the tiny hidden
transgressions.

Everything is waiting for you, David Whyte, 2003

6. Study 2: Quality of Entrepreneurial Design Conversations

The previous chapter assessed how entrepreneurs can use designerly thinking as an embedded activity in developing their business proposition. Entrepreneurs engage in several activities simultaneously, and switch between these activities constantly. These findings were relevant because they offer insights into how entrepreneurial educators can propose to use design activities in the process of business proposition development. However, the findings also raised the question how entrepreneurial educators can engage with entrepreneurial students who find themselves engaged in constantly changing activities. Therefore, this chapter will investigate the second view on design

activities: design as a social process (Second row in Table 6.1).

	Design Process Designing →	**Embedded Design process** → → → Designing → →
Design(erly) Thinking 	Wicked Problems and Reflective Practice	The IDER Model
Design as a Social Process 	**Design Discourse**	**Quality of Conversation in Participatory Innovation**

Table 6.1: This present study investigates how entrepreneurial students and educators are designing throughout a social process, using design discourse and quality of conversation in participatory innovation as a lens.

The literature review in chapter 3 on design as a social process proposed to build on the work on design discourse (Bucciarelli, 1988) and on the work of participatory innovation (Buur and Matthews, 2008). Bucciarelli (1988) introduced the notion of Design Discourse and identified several social processes that typically take place in design processes. Participatory Innovation emphasised these social processes of interplay between design and innovation processes. In Participatory Innovation, Buur and Larsen (2010) introduced the notion of *Quality of Conversation* and discussed how these conversations can lead to innovation when:

1. *Crossing intentions are allowed to surface;*
2. *New themes emerge in the interactions between crossing intentions;*
3. *New, vigorous concepts emerge that resonate with participants' own experiences;*
4. *There is a spontaneity that allows participants to imagine new roles;*

5. There is an ongoing discussion and readjustment of goals; and

6. Facilitation is exercised within the circle of participation, rather than from 'outside'.' (Buur & Larsen, 2010, p. 163).

The work of Buur and Larsen illustrates how complex social processes can be summarized in several mind-sets. These mind-sets are useful because they offer insights into how educators can interact throughout the changing activities of student entrepreneurs. The present chapter explores how these *qualities of conversation* as identified in the context of participatory innovation, relate to the context of entrepreneurial education, where educators and students develop the business proposition through interactive and conversational processes. What makes the qualities of conversation a remarkable concept, is its element of addressing the creation of innovation in situations where innovation cannot be defined. In the early stages of Participatory Innovation projects, it is not known yet what are the measurable criteria to define the success of 'the innovation'. Buur and Larsen (2010) are interested in instances that move the conversation forward and therefore foster innovation that otherwise would not be uncovered.

This present study is interested in those situations that 'move the conversation forward'. For entrepreneurial students, it is often unknown yet what moving forward exactly means, but the move forward means that educators and students are in a dialogue which is more than a simple back and forward of questions, answers and comments. The aim is not to define measurable criteria, but to truly focus on that what happens in conversation, which is fuzzy, positive and negative at the same time, and therefor paradoxical. This chapter will introduce, based on *qualities of conversation,* the new notion of *qualities of entrepreneurial design conversation*. The aim of this chapter is to answer RQ4:

RQ4: What Qualities of Entrepreneurial Design Conversation can be identified in the social design process of coaching students in developing their business proposition?

These qualities of entrepreneurial design conversation can mainly be identified in educational situations where educators and students are in conversation with each other. In the context of this study, these are coaching sessions. Before discussing the main study, I will first introduce the theoretical background of 'coaching'.

6.1 Coaching

For coaching, the following definition is widely accepted: *'A collaborative, solution-focused, results-orientated and systematic process in which the coach facilitates the enhancement of work performance, life experience, self-directed learning and personal growth of the coachee'* (Grant, 1999; basic definition also referred to by the Association for Coaching, 2018). In addition, Grant (1999) adds that the techniques of listening, questioning, clarifying and giving feedback are essential for good coaching. The definition is extensive but also general. Especially in the context of design and entrepreneurship, the definition could be examined in more detail. The following section will break down the elements of the definition and assesses them in the context of this thesis.

The *collaborative* element seems valid; especially in the light of *designing as a social process* and *participatory innovation* (Buur and Matthews, 2008) there is a collaboration between different actors.

The *solution-focused* element is less obvious. Especially the work of Sarasvathy (2007) on effectuation in new venture creation processes and the work of Dorst and Cross (2001) on problem and solution spaces in design processes illustrated that it does not always lead to a solution. The focus can also be on better a understanding of the problem, or engaging in better ways with stakeholders, without directly focusing on a specific solution. Consequently, it is not necessary that entrepreneurial coaching is always solution-focused.

In addition, a *systematic process* is not immediately applicable to the context of this thesis. Chapter 2 established to take a process view on understanding the development of the business proposition, so the term *process* should be included in the definition on coaching. But the *systematic* element is less clear. The literature review in chapter 2 and the empirical findings in chapter 5 illustrate that entrepreneurial process as understood from a design perspective are not always systematic. Temporal dimensions are at play, while entrepreneurs engage in several activities simultaneously. It is the aim of this thesis to embrace the complexity of this process.

The *facilitating role of the coach* does apply to the context of this thesis. Educators are in charge of organising entrepreneurial courses for students and are thus in charge of facilitating.

Finally, the *enhancement of work performance, life experience, self-directed learning and personal growth of the coachee* do all fit this thesis' understanding of coaching in the context of entrepreneurship education. Chapter 2 proposed to work with education 'through' entrepreneurship. Students are working on their own venture, and by developing their new venture they direct their own entrepreneurial learning and develop their identity as an entrepreneur.

Therefore the following, adapted, definition of coaching is used in the context of this study:

'"A collaborative, problem and solution space-focused, and complexity-embracing process, in which the coach facilitates the enhancement of work performance, life experience, self-directed learning and personal growth of the coachee'.

With this new definition, I will establish the approach of coaching in this study. The aim of entrepreneurial students is to develop their business proposition while simultaneously learning on an

academic level. Knight (2017) proposes three approaches to coaching. Knight's view is useful, because he describes the phenomenon in both an educational setting (where there is a student and a coach) and an industrial setting (where there is a client and a coach). The entrepreneurial students in the context of the present study find themselves in both entrepreneurial education and practice, where both approaches on coaching are applicable. Knight (2017) differentiates between three different coaching approaches: facilitative, dialogical and directive coaching (Table 6.2).

Facilitative	**Directive**	**Dialogical**
Coach does not share expertise	Coach's expertise is the focus of the coaching session	Coach shares expertise dialogically when appropriate
Student does most of the thinking	Coach does most of the thinking	Coach and student think together
Student-focused goal	Strategy-focused goal	Application-focused goal

Table 6.2: Three approaches to coaching (adapted from Knight (2017))

In facilitative coaching, the role of the coach is mainly on facilitating, with little focus on the skills and knowledge that the coach has. Facilitative coaching builds on the work of Whitmore (2002), who states that *"the coach is not a problem solver, a teacher, an adviser, an instructor, or even an expert; he or she is a sounding board, a facilitator, a counsellor, an awareness raiser"* (Whitmore, 2002, p. 40). Facilitative coaching works best when coachees already have the knowledge required to approach the situation that the coachee is dealing with. However, the coachee has difficulty to apply this knowledge to his own context. Through inquiry, the coach lets the coachee 'to see the light', without

pushing the student too much. As Whitmore (2002) describes *"the relationship between the coach and coachee must be one of partnership in the endeavour, of trust, of safety and of minimal pressure"* (p. 20). It is not immediately clear how the facilitative approach would function in the context of entrepreneurship education; students do not have all the knowledge yet that is required to develop their business proposition. On the other hand, the students are starting their new venture, and it may not be the role of the coaches to change the content of this process.

Directive coaching is in many ways the opposite of facilitative coaching. The main goal is to let students adopt 'proven models'. The idea is that there are certain known models that can solve the struggles of the student, but that are unknown to the student (yet). The prerequisite is that the coaches are well aware of the proven models. The directive coach has special knowledge, and his job is to transfer that knowledge to the coachee. A critique to this approach is that it can oversimplify the complex world that the student is dealing with. Especially in entrepreneurship education, the context of every student new venture may be unique and not always suitable to a one-to-one transfer of knowledge.

Dialogical coaching has elements of both facilitative and directive coaching. Dialogical coaching focuses on helping a coachee to become aware of the answers he already has himself. The dialogical approach is close to facilitative coaching with a focus on inquiry. The difference is that coaches do share their experience and propose ways of working to students. However, coaches leave it up to the students if and how they want to incorporate those knowledge and those experiences. It is in conversation that 'the current reality' (Knight, 2017) is addressed. Students have the opportunity to discuss what struggles them in the current reality and the discussion is on moving the development forward. The elements of dialogical coaching fit the context of

education through entrepreneurship, in which students work on the development of their own business proposition. The work of Buur and Larsen (2010) on quality of conversation shows similarities with the dialogical approach. Buur and Larsen stress the constant dialogue between participants and facilitators. However, in their work there is more attention for 'facilitating from within'. The dialogical approach as described by Knight (2017) assumes that the coach takes a perspective from outside, while being in dialogue with students. This difference is worth to explore in the empirical part of this chapter. For now, this chapter will follow the line of the dialogical approach towards coaching.

The dialogical approach shows similarities to coaching approaches that exist in the context of design education. Schön (1987) describes active coaching by a teacher which involves *'giving students practice facing real problems, testing solutions, making mistakes, seeking help, and refining approaches'*. Similar to the dialogical approach, Schön emphasise how there is a focus on inquiry with the aim to develop. Schön's view is often adopted in design education and design coaching. At the faculty of Industrial Design Engineering at the Delft University of Technology (the context in which this thesis was written), the majority of design courses employ educators who coach students in their design processes. The design projects that students are working on are often about *real problems*, in which students *test solutions* and will inevitably *make mistakes*. It is in conversation with design coaches that students *refine their approach*. The approach taken at the the faculty of Industrial Design Engineering at the Delft University of Technology shows overall with Schön's description of active coaching. Since this thesis investigate how design practices can improve entrepreneurship education, it is fruitful to follow the line of dialogical coaching which has been used in design education for a long time.

The continuation of this chapter will further explore how conversation

in the context of coaching entrepreneurial students have certain qualities that foster the development of the business proposition.

6.2 Study Set-up

To develop an understanding of *quality of entrepreneurial design conversations*, I analysed coaching sessions of the master-degree level course "Clean Tech Launchpad" in which student teams develop a new high-tech venture. I taught this course together with two colleagues from the Delft University of Technology, and in collaboration with lecturers from the Centre of Entrepreneurship Education of the North-eastern University at Boston in the United States of America. The course took place from January 2016 until June 2016. The main requirements for students to participate in the course were that 1) they worked in a team with other (student) entrepreneurs, and 2) that they, as a team, already took first steps in the development process of their business proposition. This development could be either on the technology, the market, or the financial aspects of the business proposition. Most importantly, students should have done more than just 'coming up' with a first business proposition. In terms of an IDER process, the course aims at student teams that are in the highlighted area as shown in Figure 6.1.

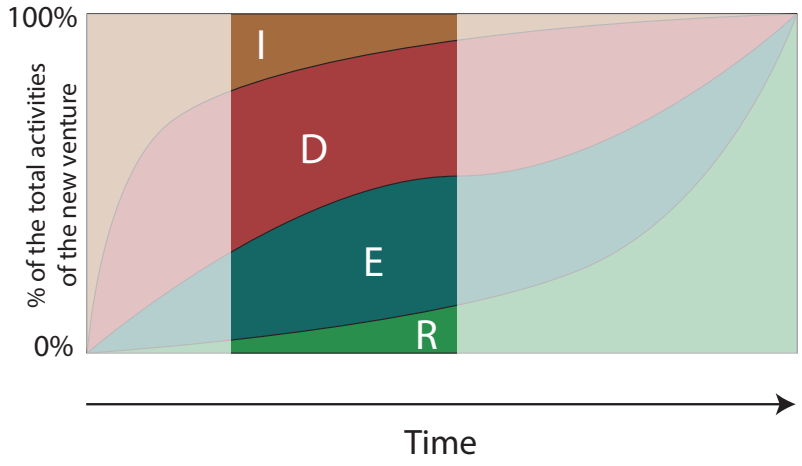

Figure 6.1: The stage of the development process of the students throughout the course

Figure 6.1 illustrates that the course mainly focuses on Designing and Engineering with the aim to 'sharpen' the business proposition and to get the students ready to engage in more Realisation activities later on. At the same time, figure 6.1 illustrates that the students are working on all I, D, E and R activities at any moment in time, and that the challenge for the coaches is to find ways to have coaching conversations about all I, D, E and R activities.

Twenty teams of two to five students per team applied to the course and we selected nine teams to participate in the course, based on how 'developed' their business proposition was. We consciously want students to apply as a team as chapter 2 illustrated that rarely any entrepreneur has all entrepreneurial traits, by having at least two entrepreneurs in a team, more entrepreneurial traits are covered.

A majority of the teams that applied for the course had not developed their business proposition yet. We advised these students to take some of the other entrepreneurial courses on generating a business proposition. Table 6.3 provides an overview of the nine selected teams and a description of their business proposition at the start of the course. Since the student teams are still developing their new ventures, the descriptions are general, to protect the strategic position that these students want to create. The aim of this study is not to assess in detail all aspects of the business proposition, but to assess how qualities of conversation in the coaching session lead to changes in the business proposition.

New Venture	Number of Students	Description
Aerospace	4	New technology to develop a space shuttle
CSR Money	2	Service to assist companies with their corporate social responsibility budget
Design Jobs	2	Algorithm driven job searching platform especially for design students
Food	2	New technology to deliver food
Hospital Aid	5	Technology service to help doctors to explain treatments to patients
Plastic	3	New technology to separate plastic waste
Toothbrush	2	New technology in tooth brushing
Virtual Reality	2	New technology in virtual reality gaming
Water Bottle	3	New technology for clean drinking water in a bottle

Table 6.3 Overview of the nine teams taking part in the course

The course consisted of two parts. First, entrepreneurship experts from North-eastern University gave lectures every fourth week on an important element of new venture creation processes. These experts have entrepreneurial experience since they developed and launched several business propositions on their own. They now apply their entrepreneurial experiences in research and education activities in academia, while still being involved in consultancy work with new ventures.

The experts gave lectures on the topics of (1) Business propositions, (2) Prototyping, (3) Financial projections, (4) Pitching, and (5) Scaling up. The experts provided a three-hour interactive lecture on the topic, including practical examples. They asked students to apply the theory to their own ventures. Furthermore, the students used the book "New Venture Creation: An Innovator's Guide to Entrepreneurship" (Meyer &

Crane, 2010) to gather more knowledge on the different topics.

The day after the lectures we had individual coaching sessions with each team. In every session the experts from North-eastern University, one or two colleagues from the Delft University of Technology and me, had the role of entrepreneurial coaches. The coaching sessions would last about 45 minutes per team. Additionally, we invited another team to join each coaching session, and we asked them to act as 'observers' and 'advisors'. In this way, teams could learn from each other's business proposition development processes. By hearing what other teams were struggling with, teams could reflect on their own practices and improve their own business proposition. As well, we enriched the liveliness of the conversations by bringing in the opinions and critical thinking capabilities of other students. Textbox 6.1 shows the setting of the coaching conversations.

Figure 6.2: An overview of the coaching setting of the course.

This specific coaching session involved seven people (Figure 6.2):

1: Student 1 of Design Jobs, he is one of the students being coached and he takes an active role in explaining their business proposition and discussing how to improve the business proposition.

2: Student 2 of Design Jobs, he is the other student being coached, and he took up the role of writing down the insights with the aim to summarise them into action points.

3: Student 1 of Water Bottle, he is one of the students in the role of 'advisor'.

4: Student 2 of Water Bottle, same role as student 1 of Water Bottle, also an 'advisor'.

5: Professor from the North-eastern University, coaching the students. The educators from North-eastern University would normally take the lead during the coaching sessions, since they have the most experience in developing business propositions.

6: Researcher/educator from the Delft University of Technology, specialised in pitching, coaching the students on how to communicate their business proposition, but also providing general feedback on the business proposition.

7: Me, coaching the students on their business proposition and simultaneously taking notes on the development of the business proposition of the teams.

Textbox 6.1: Overview of the coaching setting

In the coaching sessions, students and coaches applied new insights from the lecture and reflected how these insights could help them to develop the business proposition of the student teams. Towards the end of the coaching session the students were asked to develop and discuss potential actions for the near future. All coaching sessions were video recorded. In total, there were five coaching sessions with each team totalling up to 45 coaching sessions. The coaching sessions took about 45 minutes each, which resulted in around 34 hours of video footage covering all coaching sessions.

After the coaching session, the student teams delivered a report of one to two pages, reflecting on the coaching session. They wrote down what they learned from the coaching sessions and how it affected their business proposition development process.

6.2.1 Data Analysis

The six qualities of conversation as defined by Buur and Larsen (2010) were the starting point for the analysis. The analysis of the coaching conversations between educators and students aimed to identify if and in which form qualities of conversation were present in the coaching conversation and how these qualities are specific in the context of entrepreneurship education. Section 5.3 described how this study uses the method of sense making in complex responsive processes (Stacey, 2007). Figure 6.3 illustrates that in this research methodology the data set for this study consists of three elements:

1) The reflections of the researcher;

2) The reflections of the participants;

3) The interactions among the participants.

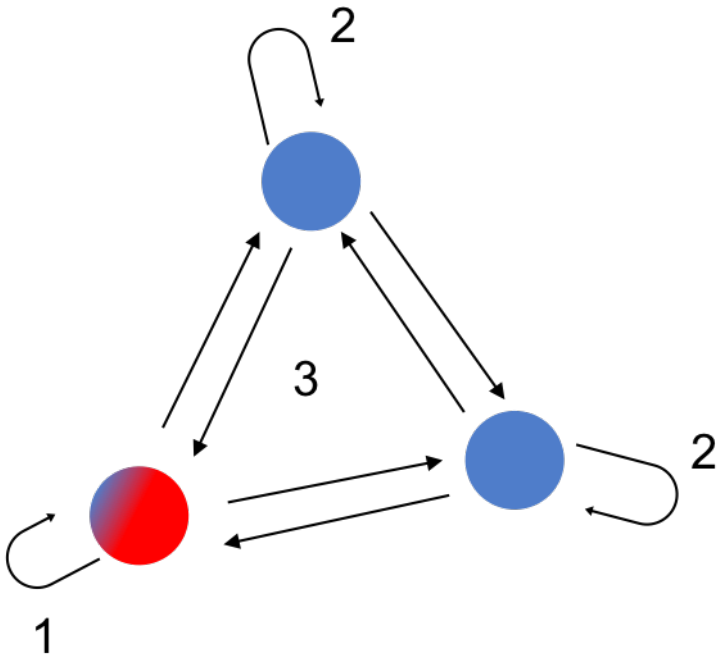

Figure 6.3: To make sense of complex responsive processes, the interactions between the students (blue circles) and the researcher (blue/red circle), the reflections of participants, and the reflections of the researcher are all data to be analysed.

The aim of this study is to bring these three kind of data sources together into one holistic understanding. The following three steps describe how I analysed the data:

1. The reflections of the researcher: I took part in the 45 coaching conversations. My role throughout these coaching conversations was twofold. First, I gave advise to the students on how to better develop their business proposition. Second, I had my research agenda in mind, with the aim to identify instances of *quality of conversation* in our conversations. Building on the work of Stacey (2007), I was searching

for what Stacey would call 'striking moments'. These are moment in which the researcher recognizes what is going on, but is still puzzled what it exactly means that is going on at that moment. This is a paradoxical situation in which something happened that 'allowed the conversation to move forward' (Stacey, 2007), but it was not clear yet why it helped. To improve the understanding of this notion of striking moments, it is useful to build on the work of Anderson (2006), who suggests to be both convert and opportunistic in capturing one's own experiences. To be convert means to follow a pre-set research agenda, in this case, to identify instances during the conversations where qualities of conversation as defined by Buur and Larsen occurred. To be opportunistic means that the researcher should allow himself to describe social situations which would not necessarily fall within the pre-set research agenda but are still 'striking', and that still moved the conversation about the business proposition forward. Stacey (2007) stresses that it is fine that the researcher is not always fully able to capture why these moments are striking, It is during the later analysis that this can become clear. The key issue is to take note of these moments while the researcher is in the conversation. The notes and reflections on these striking moments are the first data points for this study. Textbox 6.2 describes an example of my notes for each of the qualities of conversation with a short explanation. Textbox 6.3 provides examples of the 'striking notes'.

Notes related to the six qualities of conversation.

Crossing intentions are allowed to surface:

Second coaching session on Prototyping, Water Bottle, 17th of March 2016

I don't think the coach and the student are agreeing at all with each other on the market to address. Still the conversation is respectful and not tense.

New themes emerge in the interactions between crossing intentions;

Second coaching session on Prototyping, CSR Money, 17th of March 2016

Interesting, in the previous coaching session [with the Water Bottle team, see above], there were crossing intentions and no agreement, but also no immediate action. Here the two students of CSR money have different intentions on which person in the client's company to address (have to listen back to the recording for the names..) but this very disagreement allows the coach to propose a completely new strategy on addressing clients by means of talking directly to the CSR departments.

New, vigorous concepts emerge that resonate with participants' own experiences;

First coaching session on Business propositions, Design Jobs, 18th of February 2016

[Coach from Boston] asked the students from which study background they were. […] the discussion was not so much on the business proposition itself but mostly about what would be interesting to do considering the experiences these students have

Textbox 6.2: examples of notes I took during the conversations linked to the qualities of conversation

There is a spontaneity that allows participants to imagine new roles

Fifth coaching session on Scaling up, Aerospace, 26th of May 2016

Great to see that the students start to focus on their own roles within the company. In the first meeting, they all did the same, now they start to have their own task, this is progress!

There is an ongoing discussion and readjustment of goals

Third coaching session on Financial projections, Toothbrush, 22nd of April 2016

[This student] is so well capable of lining up what he wants to achieve with his graduation project and what he wants to do in this course. The goals for his graduation project still stand, but form a constant input to tweak his goals for this course and the development of his business.

Facilitation is exercised within the circle of participation, rather than from 'outside

First coaching session on Business propositions, Virtual Reality, 18th of February 2016

This was the first instance where we as coaches had actually an involved discussion in which all the coaches were building on each other's insights. I almost felt that we became part of the work that these students are doing!

Textbox 6.2 Continued

Examples of striking notes

The notes below display an illustrative 'striking moment' from each of the five rounds of coaching sessions.

First coaching session on Business propositions, CSR Money, 18th of February 2016

The coach from Boston just literally said: "you can find a lot of information on Google" and then went on Google and went to the first page that said something about CSR budgets. I am quite sure the students also found that already, but still a coach can do this and ignite a fruitful discussion..

Second coaching session on Prototyping, Food, 17th of March 2016

The students are still struggling to clearly communicate what they are working on, they are talking more about the activities they did in other courses and how these activities relate to our course.. still, the conversation is not boring..

Third coaching session on Financial projections, Hospital Aid, 22nd of April 2016

The students want to show a prototype to the coach [from Boston], but the coach wants to start the discussion by addressing the financial plan. As a designer, I would always be interested in the prototype first, but discussing the business plan still leads to a fruitful discussion. Interesting..

Fourth coaching session on Pitching, Hospital Aid, 12th of May 2016

Amazing to see how the students are in control of the meeting, they know so well what they want to get out of it! This is a conversation on an equal level.

Fifth coaching session on Scaling up, Aerospace, 26th of May 2016

It is so clear that these students will need many years before they can enter the market. Still the discussions about scaling up are fruitful and we can discuss concrete plans, even though this is all 10 years down the road. Conceptual discussions are still useful!

Textbox 6.3: Examples of stiking notes

2. The reflections of the participants: Additionally, the students wrote reflections after the coaching sessions. I assessed these written reflections following the same logic as described by Anderson (2006). I identified which parts of the reflections linked to one of the six qualities of conversations, and would therefore require further investigation. Textbox 6.3 describes examples of reflective texts of the students for each of the qualities of conversation with a short explanation. The reflections of the students are the second data point of this study.

Examples of the written reflection of the students for each of the six qualities of conversation

Crossing intentions are allowed to surface

One of the CSR students wrote in their reflection after the second coaching session:

"We want to rank employees on their behaviour (but there is the issue of privacy as pointed out by [one of the coaches])"

This is an example where the student and the coach have different intentions on which direction the business proposition should develop (benefits of ranking employees versus concerns regarding privacy). The student did not write about a clearly defined next step on how to proceed. It seems likely that 'these crossing intentions were allowed to surface' throughout the coaching session, without following a pre-set agenda or a pre-set goal in mind.

New themes emerge in the interactions between crossing intentions

One of the Plastic students wrote in their reflection after the first coaching session:

"[Plastic student 1] suggested to take [Multinational Company] as launching customer, [Coach] stated that these big companies are slow,

Textbox 6.4: Overview of the reflections of students, related to the qualities of conversation

which makes it difficult to deal with them. As well as a change in management might have severe consequences.

[Coach] mentioned two other major players in the industry: [Large Company 1] who are dealing with major recycling and sustainability issues. [Large company 2] provides free designs for plastic products, but require a production contract with them for 2-3 years, this might be a very interesting player since they produce for a wide variety of [end] customers."

There are two crossing intentions present: one intention expressed by the student to aim for a multinational company; and one intention expressed by the coach to aim for companies that are a bit smaller than the multinational companies.

This opens up the new theme of possibilities in which the new venture could target different end customers with a different kind of business proposition.

New, vigorous concepts emerge that resonate with participants' own experiences

During the third coaching session, the coach stressed to the aerospace team that the students had to put more emphasis on their background, and how their background was helpful for their new venture. One of the Aerospace students wrote in their reflection on the third coaching session:

[Aerospace student 1] is currently conducting his graduate research at the Aerospace Engineering faculty of the TU Delft. His research focuses on the development and detailed modelling of a cryogenic rocket engine with a thrust in excess of a metric ton.

Later in the reflection the student writes:

We could focus on developing an engine first, and the whole rocket later.

This is an interesting example where the coaching conversations were focused on the own experiences of the students, and where this conversation was used as input to fine-tune the development of the business proposition.

Textbox 6.4 continued

There is a spontaneity that allows participants to imagine new roles

One of the CSR students wrote in their reflection on the first coaching session:

According to [the coach] […] [potential customers] go to McKinsey to get ideas but we can do it quicker and cheaper than McKinsey. McKinsey would be a competitor, but we are potentially better.

Already during the first coaching session, the conversation has a spontaneity that allows the student to imagine that their new venture will be the new McKinsey for a specific field of application. This does not mean that the student new venture will immediately become the new McKinsey, but at least the conversation with the coaches allowed to fantasise about the possibility.

There is an ongoing discussion and readjustment of goals

One of the Virtual Reality students wrote in their reflection on the first coaching session:

"Before we do anything else, our product needs a name."

From the reflection, it would seem that defining a name became the primary short-term goal for the students. However, it seems likely that the defining a name for the product will not be the only goal that has been discussed. It seems fruitful to look into the video recordings again to identify how the goals were readjusted.

Facilitation is exercised within the circle of participation, rather than from 'outside'

For this quality of conversation, I noticed that the data points come from my own reflections. This is understandable, since the students wrote own the key points and next steps for their new venture. Hence, they did not reflect of the role of the coaches as facilitators.

Textbox 6.4 continued

3. The interactions among the participants: In step 1 and 2, I went systematically through the six qualities of conversation as defined by Buur and Larsen (2010). For every quality, I categorised all the notes I took myself and the reflections of the students. In step 3, I went through the recordings of the coaching sessions to go back to the moment(s) in the conversations where something 'striking' happened, that was defined in step 1 and/or 2. I transcribed the specific part of those conversations. This is the third data point of this study. It is important to mention that these data points in the third step are not always a one-to-one link to the first or second data point. It is especially during this last step of integrating different sources of data that the involved role of the researcher becomes important and that the method of sense making in complex responsive processes differentiates from interaction analysis.

Similar to the first study (chapter 5), I could have transcribed all the coaching sessions and systematically coded for the several qualities of conversations, based on the notes and reflections as described in step 1 and 2. Stacey's (2014) critique to that approach is that there is no room for the 'lived experience' of the researcher. The researcher would aim to step out of the interaction that he has been part of, while the fundament of understanding interaction as complex responsive processes is that '*no one can step outside their interaction with others*' (Stacey and Griffin, 2005). The focus is on sense making of special moments with respect to the rich experience of the researcher in that specific instance, in comparison to generalisation over an extensive list of different moments. The first two steps have ensured that 'the special moments' are not coming out of nowhere; by systematically going through notes and reflections, these moments are carefully chosen. It is during this last step that the researcher moves away from his detached position and allows himself to go deeper into certain moments of conversation. It was during these moments that my involved position as a researcher offers extra reflection and an extra layer of depth to the results of the study.

The findings in section 6.3 will illustrate for each of the newly found qualities of entrepreneurial design conversation how that took place in the research process.

In summary, the aim of this study is to offer rich descriptions, by combining quotes from the video recordings, reflections of students and coaches, and my new reflections on how the diversity of data lead to new qualities of entrepreneurial design conversations. In the next section I will present five qualities of entrepreneurial design conversation and explain how the different elements of the data set led to these outcomes.

6.3 Findings

Following the research steps as described in the previous section, I identified five qualities of entrepreneurial design conversation. I chose to first present the final findings, so it is clear how they relate to the original qualities of conversation in participatory innovation (Table 6.4).

Original Quality of Conversation in Participatory Innovation (Buur and Larsen, 2010)	**Newly found Quality of Entrepreneurial Design Conversation**
Crossing intentions are allowed to surface;	Coaches take up both the role of expert and user and allow to be challenged by the students
New themes emerge in the interactions between crossing intentions	
New, vigorous concepts emerge that resonate with participants' own experiences	
There is a spontaneity that allows participants to imagine new roles	Students try out new roles while discussing their experiences with the coaches
There is an ongoing discussion and readjustment of goals	Student goals are enabling constraints for entrepreneurial goals
Facilitation is exercised within the circle of participation, rather than from 'outside'	Coaching happens both on the IDER process and on the IDER content
-	Financial discussions facilitate business proposition development

Table 6.4: The newly defined quality of entrepreneurial of design conversation in comparison to the quality of conversation in participatory innovation.

The following five sections will illustrate, describe and reflect how I identified the five qualities of entrepreneurial design conversation and how they relate to the original qualities of conversation in participatory innovation. In section 6.4, I will come back to Table 6.4 and explain in more depth the similarities and differences between the original qualities of conversation and the newly found qualities of

entrepreneurial design conversation.

Coaches take up both the role of expert and user and allow to be challenged by the students

A first relevant notion is about how coaches and students relate to each other. The entrepreneurial experts from North-eastern University have many years of experience working as entrepreneurs. Simultaneously, the coaches from the Delft University of Technology (including me) have extensive experience working with design and innovation projects (that partly took place in the context of entrepreneurship). However, what worked for coaches in the past, may not work in this place and time for the students. An interesting theme is how students and coaches are dealing with these different perspectives while being in conversation with each other.

One instance is in a coaching session with the Water Bottle team with the CSR money team as an advising team. The water bottle team has just presented their business proposition for the first time and explained how the business proposition will address a rental market for traveling families.

> ***Coach 1:*** *I am myself a little bit sceptical, but I am supposed to be, that families of four are going to rent these. But on the other hand, they only go on vacation once per year.*
>
> ***Water Bottle Student 1:*** *But when it is cheap...?*
>
> ***CSR Money Student:*** *I would buy it and use it, why not?*

The coach indicates that he does not see value in renting out a water bottle solution, for hygienic reasons he would see this product as something that you own yourself. However, the water bottle team is getting support from the CSR Money students:

> ***CSR Money student 2:*** *But what if I would get the product right away from*
>
> *the travel agency?*

Water Student 1: *Oh yes, especially in remote areas that would make sense.*

Coach 1*: Sounds like a good idea… in theory.*

Towards the end of the coaching session, the coach is concluding this part of the discussion:

Coach 1: *Okay, I would just like to see you to prove me wrong.*

The coach is still sceptical about the product and how to introduce the product to the market. However, at the same time he is not shutting down the discussion by saying that this is never going to work at all and that they should not go for it. The students see the coach as a true expert. An expert who made good business and money with his ventures, and thus a negative advice from his side would strongly influence the students.

In further discussion, the students created a future scenario of the business proposition that they want to develop in reality. The role of the coach is two-sided here. On the one hand, he is a process expert, guiding the development of the business proposition. On the other hand, he is also just a potential user who gives his user feedback on the idea. Just because he does not like the idea as a user, does not mean this student team could not do it. This instance is a good example in which I noticed in my role as a researcher that students were learning 'through' their entrepreneurial process, and how the role of the coaches is more than just guiding the process.

In the example above, the interaction between the students from different new ventures is challenging the coach. The following is a part of the coaching conversation during the fourth session between one student from the Hospital Aid venture and the coach:

Coach: *Can you show me the state of your idea?*

Hospital Aid student 1: *[…] we worked quite a bit on our prototype, let me show you.*

Coach: *Let me stop you there, can you first show me what you have done on your financial projections?*

Hospital Aid student 1: *Ehm, well, I think it is good to first have a look at the state of our actual product, and look at the prototype*

This moment is interesting, because the student goes against the coach, takes the initiative, and decides which part of the business proposition development to discuss. The coach wants to discuss the financial aspect (since that is the topic of that week's coaching). Still the student manages to persuade him to first discuss the prototype and get feedback from the coach from a user's perspective. What follows, is a conversation where the students and coach discuss several aspects of the prototype and link them to the corresponding financial projections. What strikes me, however, is that there is a spontaneity in the conversation that allows to choose a different angle as starting point. The coach could easily have said that he wanted to stick to the plan of discussing the financial projections separately from the prototype. Still, the idea of the student to start from the prototype and take the discussion from there, is recognised by the coach. The coach got the opportunity to actually interact with the product, experience how it is to work with the product, and could then better relate the financial advice to this specific project.

The text above presents two illustrative examples that relate to several qualities of conversation. In the original work on qualities of conversation, Buur and Larsen (2010) point out that three of the qualities are:

Crossing intentions are allowed to surface,

New themes emerge in the interactions between crossing intentions

New, vigorous concepts emerge that resonate with participants' own

experiences

In the context of entrepreneurial coaching, these three qualities of conversation are general. I can see how all three qualities are present, but simultaneously they do not specifically describe what goes on in the coaching conversation; there are crossing intentions, there are new themes emerging from these crossing intentions, and these relate to the experiences from both students and coaches. However, the examples shown above illustrate that there is a certain responsibility for the coaches in how they want to engage in this process where crossing intentions lead to new insights about the business proposition. The entrepreneurial students are starting their new ventures and have therefore strong opinions about the content of the conversation. Furthermore, I experience how coaches are also stepping outside their role of 'all-knowing' expert, and can engage with students from the perspective of a user. The informal setting of the coaching conversations in which several students and coaches are present allows for fruitful conversations in which new meaning emerges. This is only possible, if allowed and facilitated by the coaches. Therefore, the first quality of entrepreneurial conversation is that *coaches take up both the role of expert and user and allow to be challenged by the students.*

Students try out new roles while discussing their experiences with the coaches

To explore this second quality of entrepreneurial design conversation, I will go deeper into the process of one of the student new ventures. The reason is that the development of 'student roles' is most visible for these students, while in the development processes of other student new ventures the development is more subtle. For illustration purposes, I choose to focus on an in-depth analysis of these students.

A first striking moment happened during the first coaching session

with the Plastic students. The plastic students developed a new technology to assist to recycle plastic. The students are explaining how they came up with a clever way of getting in contact with a potential partner. They approach the company as if they would be a customer to get information.

> ***Plastic Student 1****: I am acting like I am a customer, but [student 2] is not involved in those meetings, so he can then later contact them [the potential partner] and negotiate a deal.*
>
> ***Coach 1:*** *But I imagine this will be a chained industry structure, the sales representative will not be the same one as the ones who produce machines. They are most likely not even the same company.*
>
> ***Plastic Student 2****: Not sure..*

The conversation continues for some time on how the structure of the market looks like and who they should contact first. After the coaching session, the students write in their reflection report:

> *We learned to ask ourselves an important question. Who is the user? Who is the buyer?*
>
> *Although they might be the same, we need to identify the needs for both users and buyers and define the market size for both.*

During the third coaching session, the students are jokingly referring to this instance:

> ***Plastic student 3****: Last week, [plastic student 1] tried to make the call to a new [business partner] and discuss how we want to work together, but it did not work at all, ha ha.*
>
> ***Plastic student 1****: ha ha, it is just hard to find the right way of talking to a secretary, you know, she is often not familiar with what happens.*
>
> ***[..]***
>
> ***Coach 3 (me):*** *but didn't [plastic student 2] normally make these phone calls? I thought he was quite good at it.*

This situation is interesting, because it illustrates how the students are

engaging with potential business partners; the situation is very real and the development of their new venture is at stake. The students do not have a clear strategy yet on who takes up which role. At that moment, I think that it is a shame, because I could remember from the earlier coaching session that plastic student 2 was trying to take up this role. What followed was a conversation in which plastic student 2 indicates that he likes the role of making 'cold calls' to companies, he enjoys the challenge of trying to get through. However, the other students also want to give it a try sometimes.

During this coaching session, the students discuss with each other for some time that maybe they do not all have to do the same activities, they could divide some of them. Two months later, the students presented their work at the final presentation of the course and talk about how they manage all these different relationships.

> ***Plastic Student 3:*** *[plastic student 2] is the tough negotiator of our team, so far, he got through every secretary on the phone. […] [plastic student 1] on the other hand, is our analytical thinker and defines the strategies to approach.*

Throughout the course, the students have tried out their roles, and in the end, they have defined roles for themselves, and can also communicate about these roles. It was never directly stated by one of us coaches that roles have to be decided on. But through discussions on who the user and who the buyer is, the students realized that they cannot do all elements of the business proposition development with all of them together. They started to take up roles, relate to their own roles, and present their own roles to others. Students find themselves in the struggle of taking up roles in their new venture. The situation described above was most memorable for me because I was engaged in the process myself as a coach. We, as coaches, cannot predict which role will fit which student best. However, by relating the roles of the

student to the development of the business proposition, we get into conversations in which students will start to define their role over time. Next to designing the business proposition, students and coaches are designing the roles that each of the them enacts, related to the business proposition development. Therefor a second quality of entrepreneurial design conversation is *students try out new roles while discussing their experiences with the coaches.*

Student goals are enabling constraints for entrepreneurial goals

In the coaching session after the Prototyping lecture, it is not clear to one of the coaches what the students of Virtual Reality are actually working on. Not even after he has read the description of the team, or after the students presented a first mock up prototype of their idea.

> ***Coach:*** *Can you show me a picture of what the hell you are doing, because I was kind of getting it but I wasn't.*
>
> ***Virtual Reality Student 1****: yeah, I know...*

This is an example of that I have seen with more teams. Students have an abstract idea in their minds on how they are going to change the world, but the idea did not boil down yet to a business proposition. When the coach asks them to show a concrete picture or drawing of what they are doing they cannot do it, simply because they do not have it. At the same time, these students were already involved in conversations with potential customers and partners. In IDER term, these students were focusing only on the 'Initiating element' and the 'Realisation element' of the business proposition.

For this team, it is the first time they are involved in a course where they work on their own venture. The students took other innovation courses but the innovations they developed in these courses always stayed rather conceptual. In the Clean Tech Launchpad course, choices made in the classroom setting become very real outside the classroom,

in their own venture. This influences what kind of goals the students set for themselves during the course.

To clarify this point, in a coaching session with the Food students, one of the coaches gets rather upset when the students show a plan on how they want to get customer feedback on their business proposition.

> ***Coach 2:*** *This is the same plan [on approaching customers] as you showed us two months ago.*
>
> ***Coach 1****: Can you also tell us about the insights you got from the customers in the mean time?*

The students could not show this, because they had been working on the plan for the last two months. In other courses in their master program, they had just learned to set up good guidelines for customer interviews. The students wanted to apply this knowledge as good as they could in this project.

What follows is a discussion between the coaches and students about the amount of time the students should spend on defining their concept on paper and how much time they can actually spend talking with potential customers. To develop the business proposition, only initiating and design activities are not enough, student need to start to realise certain aspects of their business proposition already early on in the process. Realising their business proposition in this stage of the business proposition development did conflict with their student goals to develop their customer interview skills.

More students are dealing with this struggle, the following sequence is from the first coaching session with the aerospace students:

> ***Coach****: In the end, you are only addressing a small size of the market, and that is good. That becomes your argument, your storyboard. And then to make this real, you can tell how much money you need; this is what we have to do in terms of research and development. [..]*

> ***Aerospace Student 1****: that is one option. But we also discuss if we can contact [a financial person], who can finance just the first step in this plan. We will make the thing, but smaller. And that is something we can do as part of several university activities.[..] but it will demonstrate all the features, [..] and it will perfectly fit in the portfolio for the university [..].*
>
> ***Coach:*** *Yeah that sounds solid, money from the university for proof of concept. But you have potential to go big guys, come one!*

This situation is different form the situation as described with the virtual reality students. The Virtual Reality students had troubles to focus on the actual process of developing their business proposition. The Aerospace students consider two options: develop their business proposition in the collaboration with the university, or go for a larger scale of development in collaboration with industry. The coach addresses this dilemma very precise. He recognised that the students want to develop their business proposition so it fits in the 'portfolio of the university' and use all the university support while they can. Simultaneously, he also knows from his experience working as entrepreneur that it is scary for students to take 'the big jump' and develop their business proposition outside the 'safe zone' of the university. The coaches and students cannot just resolve this dilemma. Furthermore, students and coaches do not always agree what would be the best goal to work towards to. Especially since the students find themselves on the edge of taking a university course and setting up a new venture. To which extend should the business proposition be developed on paper but with high academic standards, that fits in the context of the university? And, to which extend do student engage in real conversations with potential clients and partners that may or may not lead to development of the business?

We as coaches cannot determine which of these two choices is best for the learning development of the students. Stacey (2014) mentions

in this respect 'enabling constraints'. The students set learning goals for themselves that constrain them in the business proposition development. These learning goals are also demanded by the university. On the other hand, setting the student goals is the only reason that enabled the students to take the Clean Tech Launchpad course in the first place and start to develop their business proposition. This is a paradox that cannot be easily resolved by coaches, but need to be dealt with in the midst of coaching the students. Buur and Larsen (2010) propose that *there is an ongoing discussion and readjustment of goals* as one of the characteristics for quality of conversation. In our conversations with students, there is also a constant readjustment of goals, but I can describe the phenomenon more precise. By building on the notion of 'enabling constraints' I redefine the quality of entrepreneurial design conversations as: *Student goals are enabling constraints for entrepreneurial goals.*

Coaching happens both on the IDER process and on the IDER content

The fourth quality of entrepreneurial design conversation links back to the findings of chapter 5 on the different IDER patterns. Section 6.2 stated that a challenge for coaches is to get a grip on how they can engage in meaningful interactions with students who are engaged in all these IDER activities simultaneously. Throughout the coaching sessions, I have noticed several instructive instances of this challenge. A first moment took place in the first coaching session with the Design Job team.

> ***Coach 1***: *Creating resumes [for designers] might not be as scalable as you think it might be.*

The coaches and students discuss if the business proposition of the Design Job team is scalable. The coach assumes it is not, but at the same time, the students and the coaches come to the realization that the

students have a lot of insights and access to relevant resources because they created this first business proposition. However, some more redefining is needed to find the right business proposition.

Later in the coaching session:

> ***Coach 2:*** *This might be one of these rare instances where you are your own target group.*
>
> ***Design Job Student 1****: That would be great! [..] And we can also easily have contact with our friends.*

The comment of the coach is remarkable, because during the lecture before he had just discussed how many students fall in the trap of developing a new venture to solve an issue that they have themselves. Often, these issues only exist on small scale. Students do not engage in market research to investigate if the issue has a larger potential. As a consequence, they are solving an issue that often does not really exist. In this case, the coach seems to give his permission that in this specific situation it would be okay to address a problem that the students are experiencing themselves.

The students start their reflection report with the sentence:

> *The main insight gained during the meeting was that we shouldn't focus on the status quo of applying for a job.*

The discussion in the first coaching meeting led to a new product-market combination that the students would focus on throughout the rest of the course. The business proposition became different from the business proposition that the Design Job team used in the application for the course. However, the original business proposition of the Design Job team was not bad. The team could easily have worked on that business proposition with the aim to learn about the process of new venture creation. However, the coach takes a radical stand and is engaged in newly initiating and designing the business proposition.

Another instance took place during the first coaching conversation with CSR money. The students of the CSR money already have a functioning prototype and are planning to test this prototype with a small company with about 20 employees.

> ***Coach 1**: The testing with this small company won't do the trick [because] they do not have the money to invest in this, even though they might like it. [..] Yesterday I met this guy again from [Multinational company 1] [..] let me send him an email and get the two of you connected, that would be a good place to test.*
>
> *[..]*
>
> ***Coach 2:** I also do these projects with [Multinational company 2], I think you could also do some testing there.*

This example is interesting because it illustrates how the two coaches are getting personally involved into the development of the business proposition. They are both willing to connect the student to business contact they have themselves. Therefore, their own reputation and their relationship with these companies is also at stake; the coach takes responsibility for the actions of the students. They become engaged in the new venture.

From an educational perspective, the choice of the coaches also has an impact. On the one hand, by connecting the student team to multinational companies, the coaches speed up the development process of the new ventures. On the other hand, setting up business connections with multinational companies is a good learning experience for students to try out themselves. No matter what perspective we take, in the content of this course I have seen several times that we as coaches become engaged in activities of the students. We as entrepreneurship coaches find ourselves on the edge of being educators, researchers and consultants. We educate our students but at the same time the ventures the students are working on are very real, and the students can make direct impact into society with their new venture. Schein (1999)

describes that process consultancy should only be about the process and has to be seen separated from the content. In the field of design and innovation, Buijs (2003) also argues to only focus on the process and leave the content to the participants themselves. We only allow students teams to join the course when they have a business proposition that is already partly tested. Still, we find ourselves giving advice to the students on the content of the business proposition instead of merely coaching them in regard to their IDER process. From the findings of chapter 5, one could argue that the role of a coach would mostly be to advise what kind of IDER patterns to follow and to pay attention not to get into the "R-drops". Instead of telling students to engage in more Initiating and Designing activities to redefine their business proposition, we as coaches Initiate and Design with them. Therefore, another quality of entrepreneurial design conversation is *that coaching happens both on the IDER process and on the IDER content*.

Financial discussions facilitate business proposition development

I noticed during several coaching sessions with several student teams how the students struggled with the financial aspects of their business proposition. It is hard for them to develop a meaningful understanding on how the numbers come together, and how their business will be viable over a longer period. However, some conversations during the coaching sessions offered opportunities for coaches and students to work with the financial development in fruitful ways. The first example is a part of the conversation in the financial projections coaching session with the Food Students.

> ***Coach**: Back in Boston you would have to pay a delivery guy 15 dollars per hour to deliver this.*
>
> ***Food Student 1:** I am quite sure it is less here.*
>
> ***Coach**: you have to figure that out.*

***Food Student 2**: But we can also ask customers to come and pick it up.*

This conversation illustrates an instance where the students have little knowledge about the basic financial aspect of what they would have to pay their business partner (the delivery guy). However, since the discussion does not go deep into the mechanics of the financials, it does allow the students to think about different kinds of revenue models and which elements should be included in their business proposition.

The same coach talked with the Water student right after the meeting with the Food students. Here the following conversation took place:

> ***Coach:** I am wearing my tie, so I will act like the 'wolf of wall street', ha ha. Just because you talked to people and they liked it, will not mean that they will pay for it. [..] you really have to do the calculations and see that it saves them money on the long run*
>
> ***Water Student**: But we benchmarketed these people, and they say that they like our product.*
>
> ***Coach:** yes let me stop you there again, they liked it, but that does not mean they will pay for it!.*

This conversation is different from the first conversation in the sense that there is not a clear intention from the students and coach to move forward. In the first example, the students have not completed their financial research, but the conversation allows to think about a different dimension of the business model (customers picking up food instead of collaborating with a delivery guy). In the second piece of conversation, the students have researched the indent of customers and if customers like their product. The students have not investigated how much customers would want to pay, and they have also not made calculations of the effect on their business model. The coach, in his turn, does not find a good way to communicate the importance of the financial aspect.

Another conversation takes place during the coaching session with the Aerospace team.

Coach: *But seriously guys, how much money do you need for this?*

Aerospace student 1: *Yeah true, that is millions.*

[..]

Aerospace student 2*: But for separate parts of the product it would be less.*

Here a similar conversation followed as with the Food students, in which several other business propositions are developed to sell in earlier stages. The students are not ready yet to have a deep understanding of the financial projections, but conversations about financial projections help to sharpen the business proposition. Instead of developing their very ambitious project of a space shuttle, this conversation lead to the realisation that maybe they can first develop parts of the space shuttle and sell these parts. The students do also not have the money available to develop separate parts, but at least they do have the technological knowledge.

The first and third piece of conversation on the discussion on the financial aspects helped the business proposition development process to move forward. Especially in the light of education 'through' entrepreneurship students learn most about entrepreneurship by doing it themselves in their own projects. The aim of this course is not necessarily for students to learn 'about' the best possible tools to do their financial calculations. If the students want to become an expert in financial elements, they could take another course or read books and articles on the topic. The aim of this course is to develop the business and business proposition while learning, as I also explored before. In our coaching, I can see this struggle most clearly when we coach students about the financial aspects of their business proposition. Coaches are sometimes focused too much on the financial aspects, while the examples above illustrate how the financial discussion can actually be a good platform to develop the business proposition in more depth.

Therefore, the last quality of entrepreneurial design conversation is: *Financial discussions facilitate business proposition development.*

6.4 Conclusions and Implications

The previous section illustrated how a diversity of qualities of entrepreneurial design conversation are present in the coaching conversation that my colleagues and I have had with entrepreneurial students. Based on careful analyses of the videos of the Clean Tech Launchpad course, this study suggests that *Qualities of Entrepreneurial Design Conversation* means that:

1. Coaches take up both the role of expert and user and allow to be challenged by the students.
2. Students try out new roles while discussing their experience with the coaches
3. Student goals are enabling constraints for entrepreneurial goals
4. Coaching happens both on the IDER process and IDER content
5. Financial discussions facilitate business proposition development

Compared to the qualities of conversation as described by Buur and Larsen (2010), there are similarities but also differences (Table 6.5).

Quality of Conversation in Participatory Innovation	**Quality of Entrepreneurial Design Conversation**
Crossing intentions are allowed to surface;	Coaches take up both the role of expert and user and allow to be challenged by the students
New themes emerge in the interactions between crossing intentions	
New, vigorous concepts emerge that resonate with participants' own experiences	
There is a spontaneity that allows participants to imagine new roles	Students try out new roles while discussing their experiences with the coaches
There is an ongoing discussion and readjustment of goals	Student goals are enabling constraints for entrepreneurial goals
Facilitation is exercised within the circle of participation, rather than from 'outside'	Coaching happens both on the IDER process and on the IDER content
-	Financial discussions facilitate business proposition development

Table 6.5: The newly defined quality of entrepreneurial of design conversation in comparison to the quality of conversation in participatory innovation.

The first three qualities of conversation as mentioned by Buur and Larsen (2010), 1) *Crossing intentions are allowed to surface, 2) New themes emerge in the interactions between crossing intentions and 3) New, vigorous concepts emerge that resonate with participants' own experiences* are in the context of coaching entrepreneurial students replaced by *Coaches take up both the role of expert and user and allow to be challenged by the students.* In the context of participatory innovation, a variety of actors, participants and facilitators take part in the process of innovating. In the context of entrepreneurial education and entrepreneurial coaching, there are two kinds of actors: entrepreneurial

coaches and entrepreneurial students. Buur and Larsen (2012) are not specific in identifying to which participants the first three qualities of conversation apply. Different participants obtain different hierarchical levels and thus handle conversations in different ways. Buur and Larsen mention the struggles of power and hierarchy in their work, but this does not explicitly show in their final recommendations. In the context of this thesis, there is an 'official' hierarchical structure of educator above student, which needs to be paradoxically recognised and criticised simultaneously. The notion of *coaches take up both the role of expert and user and allow to be challenged by the students* does just that.

Once this first quality of entrepreneurial design conversation is established, the other qualities of entrepreneurial design conversation can focus on the social interaction between students and educators. The qualities of conversation 4) There is a spontaneity that allows participants to imagine new roles, 5) There is an ongoing discussion and readjustment of goals and 6) Facilitation is exercised within the circle of participation, rather than from 'outside', are all specified for the context of entrepreneurial conversation in the context of coaching students (table 6.5).

In the context of Participatory Innovation, conversations focus on the value exchange between users and other stakeholders (Buur and Larsen, 2010). The elements of conversations consist mainly of what I called Initiating and Designing elements. This study illustrate that in entrepreneurial coaching conversation, new meaning is also created in financial discussions. Financial elements also consist of Initiating and Designing elements, but have strong Realization elements as well. Especially in the context of new venture creation, entrepreneurs need to incorporate financial aspects already early on in the process, which is not always needed in participatory innovation projects. Therefore, it is useful to add the notion that *Financial discussions facilitate business*

proposition development as a new and separate quality of entrepreneurial design conversation.

As contribution to the design and entrepreneurship literature, the results of this chapter should be interpreted as first indications and inspiration to further explore the notion of business proposition development as a social design process. The previous chapter positioned the role of designerly thinking in the overall development process of the business proposition. This chapter adds that, in the setting of coaching entrepreneurial students, design activities are also negotiated social activities between entrepreneurial students and educators. This chapter builds on the theoretical line that Bucciarelli (1988) and Buur and Larsen (2010) initiated. Bucciarelli (1988) first introduced the notion *design discourse* specifically in the context of engineering design projects. Buur and Larsen (2010) introduced *quality of conversation* in the context of participatory innovation. The results of this chapter introduce *qualities of entrepreneurial design conversation* as input to the academic discussion on design as a social process in entrepreneurship and entrepreneurship education.

Section 2.5 has investigated which topics educators should discuss in interaction with students; this chapter has empirically investigated how educators can address these topics. Knight (2017) describes dialogical coaching as the approach to coaching in which there is most interaction between coaches and students. However, the underpinning idea in dialogical coaching is that 'the student already has the knowledge about and the actions required to develop the business proposition inside him'. It is through interactions between coach and student that the knowledge and actions become explicit. This study investigated, following the work of Stacey (2007) on complex responsive processes, how new ideas and directions for the development of the business proposition come to exist in the interaction between coaches and students. What takes place in the

process of coaching is not just a transfer of ideas between coaches and students, but new understanding actually emerges in interaction. This means that entrepreneurial educators are always part of the ongoing interactions, rather than taking a stand 'from outside'.

This concludes the second empirical study in which I explored to understand the business proposition development process through the lens of 'design as a social process'. The findings in this chapter complement the findings from chapter 5 in which I explored to understand the business proposition development process from a designerly thinking perspective. In the next chapter, I will explore, using autoethnography as a method, how both design perspectives are experienced by students throughout the business proposition development process.

This is Major Tom to Ground Control
I'm stepping through the door
And I'm floating in a most peculiar way
And the stars look very different today

Space Oddity, David Bowie, 1969

7. Study 3: Business Proposition Development as Autoethnographic Process

The previous two chapters explored how the business proposition development process can be understood both in terms of 'designerly thinking' and 'design as a social process'. This last empirical chapter will critically assess how these two approaches are experienced while being an entrepreneurial student myself.

I will do this by stepping into the shoes of an entrepreneurial student and reflect on my own experiences using autoethnography as a method. Section 4.5 defined autoethnographic research as *"autobiographies that self-consciously explore the interplay of the introspective, personally engaged self with cultural descriptions mediated through language, history, and ethnographic explanation*" (Ellis & Bochner, 2000 p. 742).

For this study, the element of 'self-consciousness' is important. The previous two studies provided insights into the business development process and its embedded design activities. In the present study, I will explore how I experience the reality of developing a business proposition in the process of new venture creation. I will assess how my experiences relate to previous found insights. I will do this by writing autoethnographic texts that are a combination of 'realistic tales' (in which the writer describes as precise as possible what happened), 'confessional tales' (in which, for example, character flaws or bad habits from the writer influenced the cultural and social process), and

impressionist tales (which highlight rare and memorable moments in the process of doing fieldwork) (van Maanen, 1988). Section 4.5 provided an in-depth analysis on autoethnography as a method.

This study takes place in an educational setting. However, the study will address both elements in entrepreneurship education and entrepreneurship as general construct. As stated, this thesis understands entrepreneurship education as education through entrepreneurship. Therefore, the situations that I will encounter will always have 'real' entrepreneurial and design elements. The overall aim of this chapter is to answer research question 5:

RQ5: How do entrepreneurial students experience the business proposition development process as a design process?

Before going into the empirical part of my autoethnographic research, I will first assess how autoethnography is commonly used in entrepreneurship research.

7.1 Autoethnographic Methods in Entrepreneurship Research

About eight years ago, Pilegaard, Moroz, and Neergaard (2010) wrote an article in the Academy of Management *Perspectives* on autoethnographic perspectives in academic entrepreneurship. They proposed autoethnographic methods to better understand the new venture creation process by building on social sciences and humanities, and they illustrated their method with a case study. Their call for autoethnographic research has not been answered widely yet, but I will highlight a selection of work.

For example, Gartner (2010) edited a one-time issue of the journal ENTER (Entrepreneurial Narrative Theory Ethnomethodology and Reflectivity). Gartner (2010) asked several scholars to reflect on *The Republic of Tea* (Ziegler, Ziegler, & Rosenzweig, 1992). The book is a

bundle of faxes that the founders (and authors of the book) send to each other in which they explained how they made choices for the next steps in the new venture creation process. The book provided clear insights into the 'temporal' aspects of starting a new venture. Gartner (2010) appreciated the value of autoethnographic research and extended his call for researchers to engage in more narrative based research. Gartner concluded his call by the notion: *I feel a shift in the momentum of how we, as scholars looking at entrepreneurship, seek to understand it. But, I'm still in a dark wood.* (Gartner, 2001 p16).

Van Oorschot and Gottlieb (2015) took an approach similar to the approach in Gartner's ENTER journal. Van Oorschot was the detached researcher, while Gottlieb was the entrepreneur who wrote autoethnographic text on his new venture creation process. After the introduction of the first texts written by Gottlieb on how interdependencies in his new venture emerged, Van Oorschot and Gottlieb reflected together on the autoethnographic texts. Taking this approach highlighted the involved (Gottlieb) and detached (Van Oorschot) perspective a researcher can take in the process of autoethnographic research. Writing autoethnographic research does not necessarily mean that the writer is involved in the activities all the time. The researcher can take a more detached perspective to reflect on what happened. Writing several texts that contain realistic, confessional and impressionist tales (van Maanen, 1988) helps to find the balance between the involved and detached perspective to provide the richness of being involved and the rigorousness of being detached.

Engstrom (2012) presented his own experiences on the new venture creation process and described *"ways in which [he has] reproduced, disrupted, benefited from, and been hindered by the dominant enterprise discourses in the United States"*. (p41). His approach is close to the impressionist tales (van Maanen, 1988). He is trying to *"understand an*

experience [he has] lived through" (Engstrom 2012, p43). The work of Engstrom is relevant for this chapter because it recognises that one's own experiences do not always match the dominant discourse on entrepreneurship. Writing autoethnographic texts can shine another light on the dominant discourse.

Few authors have written empirical articles using their own autoethnographic texts. The majority of scholars analysed the narratives of others, and then took a perspective on making sense of the autoethnographic texts. This is unfortunate since Brinkmann (2012) illustrated that it is especially in the process of (re)writing the narrative that most of the research value is created. The generation and analysis of data happens simultaneously. Only analysing texts takes away the involved perspective of the researcher, who was in the moment of action, and thus has the opportunity to enrich the autoethnographic texts himself. This approach offers value that is rare in other research methodologies.

In this chapter, I will use my own autoethnographic texts that are based on my own entrepreneurial experiences. I explore how I can better understand the business proposition development process "as lived experience" in relation to design activities.

7.2 Research Setting

The case I work with is a five-week summer course on starting a new venture related to climate issues. The target audience for this summer course are academic participants at the Master of Science and doctoral level. A large European network involving global and local, small and large partners from the private, public and academic sectors organised the summer course. The network's mission is to bring together, inspire and empower a dynamic community to build a zero-carbon

economy and climate resilient society. The specific aim of the summer course is for participants to learn about climate change sciences, how entrepreneurship can play a role to address climate change, and eventually how to start a new venture to tackle climate change.

This European network organizes summer courses every summer, which take place at three locations across Europe. For the course of this study, the first two weeks took place on multiple locations in the Netherlands. The second two weeks took place in Trondheim, Norway. The final week took place in Warwick, United Kingdom. The 40 participants of the summer school, covered 17 different nationalities and came from a range of backgrounds like engineering, physics, design, architecture, economics, biology, law and climate sciences.

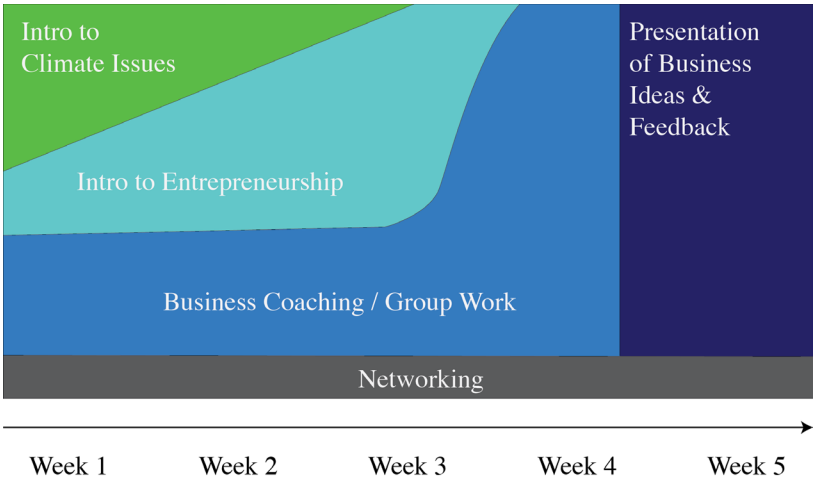

Figure 7.1: Schematic overview of the 5-week summer course (adapted from the summer course guide)

The process of the summer course is visualised in Figure 7.1. The first three weeks focused on lectures, site visits and workshops on both climate issues and entrepreneurship. At the same time, two business coaches joined us for the whole five weeks. These two coaches also facilitated the program and the process. In the third and fourth week,

there was less input by experts and more focus on developing the new venture. The emphasis in the last week was on preparing a pitch presentation and a business plan. Throughout the five weeks, there was ample opportunity for networking across the participants. Every day, new local experts were shining their light on either climate or entrepreneurial topics. The end goal of this process was that teams of three to five participants would establish a new venture and would come up with an initial business idea solving a climate issue.

The summer course has elements of education 'about', 'for' and 'through' entrepreneurship (Robinson et al., 2016) (see section 2.5). The different lectures during the 'Intro to Entrepreneurship' activities focused on education 'about' and 'for' entrepreneurship. In the 'business coaching and group work', I focused on education 'through' entrepreneurship because it was during these activities that I applied the theory to my own practice. Since this thesis focuses on education through entrepreneurship, the autoethnographic texts will focus on the activities that I undertook in the business coaching and group work with the aim to answer the research question of this current chapter.

7.3 Method

To better understand the autoethnographic texts, I first need to describe a bit more about myself. My educational background is in industrial design, innovation processes and multidisciplinary innovation. Before starting my PhD project, I worked shortly in industry, both as a designer and an innovation consultant for companies in several countries in Europe and South America. The reason for me to participate in the summer course was on the one hand to explore the possibility to start my own venture, and on the other hand to collect data for my doctoral research. It is important to be aware of my background because it clarifies that I have experience in working with

design and innovation approaches in practice. Throughout the summer course I would often first consider what the presence of a 'design activity' practically meant for the development of my own business proposition. Only in the second place I would consider how it fitted in the academic and theoretical context of this thesis. This highlights the grounded and empirical approach that I took in this study.

Throughout the five weeks of the summer course, I constructed field texts on a daily basis. Every day I wrote a couple of keywords and phrases on what happened that day while I also reflected how these experiences could be linked to literature. The following is an example of one of these field texts (what happened in plain text, *my thoughts in italic*, and links to literature as a later edited reference):

---------- *Day 2* ----------

Morning session

A presentation on climate opportunities from [expert from a Dutch Research Institute] on how it is very clear already on what the climate problems are, all we have to do is find solutions.

Somehow there is something about the problem and solution space (Dorst and Cross, 2001) that we are not tackling, we are taking the problem for granted.

----------*Later in the afternoon*----------

Workshop on teambuilding:

Interesting activity with clapping your hands and jumping in the air to get to know each other. Might work for my own courses that I am teaching as well.

I was doing this activity with a woman that I might want to work with more during this summer course. She knows about physics,knowledge that I am lacking.

Another activity on making a poster about climate opportunities was

working with a biology lady from France and a Law guy from England. Not so much came out of this short workshop.

This text is an example of both a description of factual things that happened and a personal reflection of the situation. This text is not complete, but is an example of what could be the start of an autoethnographic account later on in the writing process by describing the situation and my experiences in more detail. In this case, I address, for example, *"somehow there is something about the problem and solution space (Dorst and Cross, 2001) that we are not tackling, we are taking the problem for granted."* From my experience as a designer and from the work in Chapter 5, I know how important it is to not take a 'given problem' for granted. To develop a good business proposition, an entrepreneur would want to work with the problem and a possible solution simultaneously. It frustrates me that the expert from the Dutch research institute is so clear about the 'fixed' problems, maybe I can redefine the problem. This realisation could be a starting point to explore in more depth.

Other field texts were more reflective and personal of 'memorable' moments that I experienced. For example, this is what I wrote after a workshop on perception and business propositions:

There is something interesting about seeing things from different perspectives, what we talked about in this morning's workshop. It is always cool to show the old lady/young lady picture (Figure 7.3). People like these easy to digest life lessons on how we can look at things from two perspectives. But in reality, we switch constantly between these two perspectives. It is not either or. This applies to me personally, but it is also the case for everyone else in the team. It is nice that [the presenter] used it, but it does not give me any deeper insight in how I can really see the business proposition I am working with from different perspectives. But well, maybe I am just a snob.

Figure 7.3: My wife and mother in law (Hill, 1915). An ambiguous optical illusion often used to illustrate that there are multiple ways of seeing things.

This field text has less emphasis on describing the actual situation, and more on how this situation affected me as a participant in my own new venture creation process. There is already a certain richness in the reflection of the event. I recall that I felt 'some kind of disrespect' towards the workshop host. The workshop host introduced a picture to emphasise how several perspectives can be taken. This was exactly what I was missing in the first example in which I described about the problem solution space that was not addressed. Now this workshop tries to address it, and I feel that it is oversimplified. In hindsight, this situation is quite shocking: was I just unhappy in that moment, or does it say more about me as a person in general? how do I want to relate to it then? This could be an interesting theme to explore in more depth. Nevertheless, the field text is a confessional one. To create this field text into an autoethnographic text, I would also have to provide a clearer description of the situation. However, the confessional text would be the starting point for the insight.

In Anderson's (2006) words, some of my texts were 'convert' (in which the researcher has a pre-set agenda on what to write a text about) while other texts were 'opportunistic' (like Brinkmann's (2012) 'stumble data', in which the researcher captures the unforeseen). My agenda was to write about my experiences related to design activities while going through the five-week new venture creation process. I also allowed myself to capture other, memorable, moments and use these as field texts. Both approaches are needed to answer the research question, since it is not known before in what kind of manifestations the design activity elements will be experienced.

Based on the field notes, I wrote three autoethnographic texts. I wrote about a moment in the beginning of the course, another moment halfway throughout the course, and one moment during the last day of the course. In this way, I was able to capture the temporal dimension of the business proposition development process. The reason to write autoethnographic texts about these moments is because they all had something 'striking' (Stacey, 2007), or 'confessional' (van Maanen, 1988) in relation to the different manifestations of design activity elements. It was through writing and rewriting my texts that I started to understand why these moments were special, and what the manifestations of the design elements actually were.

7.4 Results

The following sections present the three autoethnographic texts. They started as field texts, and were subsequently rewritten several times between the summer course in August 2016 and the final version of this chapter written in August 2018. The three texts are diverse, and explore different ways of autoethnographic writing, but at the same time are also connected and have overlapping themes. For each text, I will first provide the context of the autoethnographic text, then present the text

itself, and then reflect on the text with a link literature

7.4.1 Text 1 – Team Formation and Cooking Indian Food

The Context: On the fourth day of the summer course, the team formation took place. During the first three days, all participants had the opportunity to collaborate on small assignments in different teams. Furthermore, we had the chance to talk with each other about first thoughts and ideas that could possibly lead to a new venture. The only 'requirement' for the teams was that there had to be three, four or five participants in a team. Otherwise, there were no requirements regarding nationality, profession, background, or experiences.

The Text: Today we created teams to work with for the next four weeks. I felt a bit stressed because of my broken pinkie finger (I broke my pinkie finger on the very first day of the summer course in an unfortunate volleyball accident). I was scared that I could not do much work and that this would be a problem for potential team members. At the same time, I was actually working with entrepreneurship every day in my working life, which had to give me some credit.

The two coaches did not provide any guidance on the team formation process; we could choose our own methods to form teams. There was one guy, [X], the loudest smart ass of the group who proposed to sit in a circle and everyone could say in a couple of sentences what they were good at, and what they wanted to work on. [X] was the kind of guy who believed that all choices are made rationally. Well, so we spend the next hour or so sitting and talking one after the other.

It was horrible, as no one really offered new insights in what he or she wanted or could add to a team. Everyone would just tell a 'correct story' about wanting to work together. Yes, everyone thought a good idea was important, but it was really about team spirit, working together, sharing and collaborating. No one managed to go a bit deeper into what

this would actually mean for his or her project. Then the hour was over and everyone was supposed to go and form teams. No one told this was the moment to do so, but it just happened. Apparently, we had all the information now that was needed to make rational decisions and form a team.

I walked up to a woman who was always very positive. There are these kinds of people who just always have a positive vibe around them; she was one of these people. I just asked her boldly if she wanted to form a team together. She clearly didn't want to work with me but had troubles communicating that; it took her 10 minutes to politely say no. I could not really figure out why, maybe she already talked with other people before?

I was a bit shocked after this first little disaster; I thought this would go easier for me. I spend the next 15 minutes just wandering around the room without having real conversations with anyone. I started to become a bit tired of this summer course already.

Then I saw a Dutch lady and an Indian man talking. I remembered from the day before that the three of us agreed to cook Indian food together one of these days. The Indian man was an incredibly good cook and the Dutch lady and I wanted to learn from him. I walked up to them and talked about our food plans. The accommodation where we stayed had a kitchen, so instead of eating in restaurants for two weeks, we could actually experiment with some cooking. The lady and the man were enthusiastic and we had a nice food chat about what kind of dishes to make for the next 10 minutes.

Then the Indian guy mentioned out of the blue that he wanted to work on Tetrapaks for this summer course. First, the Dutch lady and I did not know what Tetrapaks were. The guy explained that it is the kind of material that is used for making juice packs. He read somewhere

that you could use it as a recyclable material and that many different products could be made from it. He did not exactly know about the technology but it was something we could figure out later. We were in a positive flow. Then I heard myself saying: 'shall we just work on this with the three of us?' They gladly agreed and we also agreed almost at the same moment that we didn't want any other team members anymore. It was good like this.

In the evening, I felt a bit weird about what happened. I liked our team, was not completely sure yet about working on Tetrapaks for the rest of the summer course, and was mainly disappointed about my approach. I know quite a lot about multidisciplinary teams, worked in many of these teams, and I had even written academic texts on multidisciplinary teams. Why did I not use this knowledge to think a bit longer on what team to form, and to choose a bit more rationally which idea to develop?

The Reflection: This text is striking because it provides insights into how and why I felt unhappy with the process of creating a team and the choice of a business proposition, and how I handled the situation. Especially the notion of '*X. was the kind of guy who believed that all choices are made rationally*' strikes me, because the literature on "Design as a social process" already explored extensively the difficulties in working on a 'business proposition' in multidisciplinary teams (Buur & Matthews, 2010). Still, the question remains what we do in the midst of creating a team that wants to works on a specific business proposition.

As I point out in the text, I am aware of certain principles and themes from literature on team formation processes around a business proposition. But still, being unhappy with the process at that moment, makes me to ignore 'the theory'. Acting rationally, I wound consider the

positive and negative aspects of certain potential team members and gather information on how several people relate to potential business propositions. Instead, I talked with two people about cooking Indian food. The notion of Stacey (2007) and Fonseca (2002) on creating meaning in local interactions is useful to understand this situation better. When discussing organization theory, Stacey (2007) would shy away from the notion of an organization as 'an institution', as something tangible that can be described from an outside perspective. Stacey would rather talk about 'the sum of interactions between the actors involved' (Stacey, 2007) that create an organization. According to Stacey, a researcher can only understand an organization as this sum of interactions. A conversation about cooking Indian food, which transposed to a conversation on Tetrapak material, which somehow becomes the core of a temporary organization and potentially a new venture working on a specific business proposition. In hindsight, such activities could all be categorized under 'Initiating and Designing' activities (see Chapter 5). However, while being in the midst of the process, these classifications become less useful, because they do not recognize the struggles in interaction that (student) entrepreneurs go through.

Van Oorschot and Gottlieb (2015) described two similar situations in their autoethnographic texts and talked about creating interdependencies. In their work, creating interdependencies are described in two ways: as a positive moment towards a stronger relationship and as a direct reflection on how decisions in the new venture creation process are made (van Oorschot & Gottlieb, 2015). In the situation described in this text, I can relate to the 'positive moment towards a stronger relationship', although the moment of team formation was far from a purely positive one. Reading the text again, the process of creating the team for working on a business proposition seemed a rather negative experience; both before the team was created, and also in the

evening afterward. Where in van Oorschot & Gottlieb's work there is a certain positive moment, I could argue that in this situation there is a 'puzzling moment with a mix of emotions' which allowed me to create interdependencies with two potential team mates. It is in local, non-rational interactions that we created a temporary organization.

The aim of the reflection on this text is not to go deeper into the concept of the creation of meaning in local conversations, and the creation of interdependencies. Rather, I want to stress the notion of how an autoethnographic writing can highlight and handle a situation like this. Furthermore, the text is useful in understanding the two upcoming texts because it explains what the starting business proposition is that I will work with during the continuation of the summer course.

7.4.2 Text 2 – Dutch People in Trondheim

The Context: My team members and I worked on an emerging business proposition on Tetrapak material for the next two weeks. By talking to potential users, experts and manufacturers, we created a concept on how we could recycle Tetrapak, and turn the material into new products. For this production process, we needed a special technique that we still had to master. After the first two weeks in the Netherlands, we moved to Trondheim to develop the business proposition in a new environment.

The Text: Trondheim may not be the best place to get in contact with experts on Tetrapak because there are relatively few companies here, high up in the north of Norway. We were lucky however, as one of our coaches did an exchange semester back in the days in this city, and she remembered a professor in design and sustainability. She advised us to contact him as he may be able to provide new and fresh insights.

I looked up his profile and noted that he used to work at the faculty that I am doing my PhD research at, and that he did research with people from my department ten years ago. I also read that he was a full professor now, which made me wonder if he would have time for us on such a short notice.

I wrote him an email, 'Nederlanders op bezoek in Trondheim' (Dutch people visiting Trondheim). When I wrote it, I wondered if he actually still liked the Netherlands, or that he perhaps left for a reason. However, I believed that I needed some kind of 'hook' in the title to get him interested in us. In the e-mail, I explained what we were doing and asked him for a couple of minutes of his time.

He answered within half an hour that he was organizing a conference right now, but that he could meet on Monday (which would be four days later). I was quite surprised that he responded so fast while organizing a conference. Busy people who still respond fast are normally good people, is my experience. He probably saw value in my proposal, otherwise he just would not have responded at all.

Four days later we met. First, the plan was that I would go myself to the meeting, but my two team mates also wanted to come, they were master students and were interested to meet a foreign professor. He was a bit late, 10 minutes or so, and we only had a 20 minutes meeting planned so I was a bit worried if we would still have sufficient time to discuss our business proposition.

He was very pleased to see us and offered us some soda.On a warm day like this, we could better drink some cold sodas from his own fridge than warm bad coffee from the machine, he argued. I liked him already. Then he asked us about our background. My background is in industrial design; I studied it and worked as a designer for some years. The Dutch woman also had a background in design, and the Indian man

had a background in engineering. We ended up talking about design and design education for the next 45 minutes, and he showed us around the department. My Indian team mate got nervous a couple of times because we did not talk about Tetrapak at all. I was, however, enjoying every second of the tour. The university reminded me of the University of Southern Denmark where I did my master studies some years before. Small rooms, small groups of students, and a Scandinavian atmosphere. It is a nice and friendly atmosphere, different from the large-scale faculty where I was working now. It was nice to experience this small-scale approach to design and education again. I told him about my memories of my time as a master student. He responded that he very much liked that university as well, and that he saw similarities between that environment and his own faculty at Trondheim.

After the tour, we still discussed our business proposition for 30 minutes, and he explained that in his design classes, students would normally start to make a prototype right away. It was a relief to hear that advise because so far during the summer course, the coaches advised us to use a more analytical approach; it was only in the fourth and fifth week that we would make prototypes. He almost became a part of our team, and together we strengthened the business proposition that we would work on for the rest of the course. I am not sure if he really added something new; he just brought a positive vibe to our team. He was able to put elements in place by putting them into a perspective that I could recognise.

The Reflection: In my daily practice of educating students, I often hear from students how surprised they are that it is easy to get in contact with experts or business contacts once you just contact them. People,

who seem unreachable at first, are in reality easy to approach and often become a turning point in moving forward with the new venture and the business proposition. Although I am aware of the willingness of experts to help, I still felt unsure about it when faced with the situation myself. Although I had an indirect connection with the professor, I was hesitant to find a way to contact him. A reason why it was difficult for me to set up the connection was that I just moved from an environment with numerous connection possibilities (the Netherlands) to an environment with less connection possibilities (Trondheim). I expected it to be more difficult to create new connections in Trondheim, and therefore it became more difficult for me. Being aware of and reflecting on the (changing) environment is helpful for entrepreneurs to see what the opportunities are for any individual in a different environment.

Furthermore, the professor I contacted is an expert in sustainability and design, but he was mainly helping me and my team in the process of developing our business proposition. Whereas in the first text, I reflected on creating interdependencies in the creation of a new venture team, independencies here play a role in the short moment that the professor becomes a part of 'the temporal organisation' (Stacey, 2014). Becoming part of the team is in this situation possible because the Dutch lady and I can relate to the research he does and the design environment that he is working in. We created the same kind of positive movement toward a stronger relationship as mentioned by van Oorschot & Gottlieb (2015) in their discussions on new venture creations. It is at this specific moment that is illustrative of what Fonseca (2002) means with creating meaning in local interaction, in which the professor becomes part of the temporary organization (Stacey, 2014) of the new venture, and allows us to find ways to move forward.

The notion of creation of meaning in local interaction relates to *the qualities of entrepreneurial design conversation* that I explored in

chapter 6. In that chapter, I touched on the notion of 'the temporal organisation' that students and educators are part of at the moment of a coaching conversation. I explored how coaches are officially not part of the organisation but are still involved in activities to develop the business propositions. In the context of the present autoethnographic text, I experienced from a student perspective to be part of a temporal organisation. It is during these moments of temporality that I felt that I created a good understanding of what I wanted to do. The interaction with the Dutch professor allowed for an understanding of both the proposition and the process that I could relate to, because it had clear design elements. To explain this, I will relate to the analysis in chapter 2 of the entrepreneurship literature. One of the main critiques was how the 'entrepreneurship literature' aims to identify new venture creation processes that are general and distinct. The variations of the IDER process model in chapter 5 illustrated that a model can have general elements (the I, D, E and R activities) and have specific manifestations for different contexts, which resulted in several IDER patterns. I would argue that the meeting with the Dutch professor as described in the text was a turning point in the development of the business proposition for two reasons. First, we had the opportunity to create a temporal organisation with the Dutch professor, and second, in this interaction I could better identify for myself the designerly process that I wanted to follow. In a way, the encounter with the Dutch professor was namely a 'short' IDER process in itself that took place in the context of this temporal organisation. That shorter IDER process was part of the larger IDER process that I went through throughout the five weeks. Finding ways to set up the meeting are Initiating activities. The conversations in which the Dutch lady, me and the Dutch professor find common ground, are Design activities in which we explore what we are actually talking about. Once this was established the 'real' meeting about the business proposition are Engineering and Realising activities in which

we could make concrete proposals about the business proposition. Whereas chapter 5 investigated how the IDER model can describe the overall process of developing a business proposition, this text illustrates an example of how a short activity in the context of a temporal organisation also goes through a short IDER cycle.

7.4.3 Text 3 – The Struggle of Designing a business proposition

The Context: The last text does not need much explanation of the context upfront as the text itself will provide the context throughout. The events took place at the end of the summer course.

The Text: Okay, I am not an entrepreneur. I have read too much on entrepreneurial traits and 'the entrepreneur' to make an academic claim on this, but I do not 'feel' at this moment that the entrepreneurial role provides me with much joy.

It is week five of the summer course and it starts to become tiring. I am mainly done with the everlasting positive approach that coaches, experts and all the entrepreneurs want to transmit to us. I know entrepreneurship is largely about staying positive, but it started to feel 'fake'. I start to doubt why I am actually here. We keep on thinking and rethinking our business proposition. Hence, a lot of testing and pivoting. It is exactly this what I am telling my students all the time. Now I am experiencing it myself and it has been enough. I do not want to see another Tetrapak anymore. The opportunities are endless, the network that is needed for it is too big. I want to go back to my safe environment of being an academic researcher.

The situation that best describes my struggle took place a couple of days before 'the final' pitch of the summer course. The coaches made

it into something big. One of the coaches told us that we needed to prepare very well as there would be a jury of seven members, and these were important people. 'So, what can we win then?' one of the other participants asked. Some investment in our new venture? A meeting with potential contractors and investors? The answer was 'none of the above'. The coach told us that there would be two prizes, one prize for the best team and business idea according to the jury, and one audience award for the best team and business idea. The price would be a printed and signed award. Wow! I told my team in a sarcastic manner as I had no interest at all in winning such an award. The European network is a good organization, but I did not think that an award from this organization would be as valuable as an award from Times Magazine. Luckily, my team members also did not care much about the award.

But what would we do it for then? Why would we spend much time on preparing a good pitch? My team and I discussed this issue, two days before the final presentations of this summer course, and we could not figure it out. We did not care much about the award and most of the other people in the audience were fellow participants or others who already knew about our new venture idea, so there was no need to make them enthusiastic anymore about our business proposition. And, as I described above, I was getting a bit tired of being an entrepreneur anyhow, and we started to doubt if we were going to continue this new venture after the summer course would be over. Sure enough we became experts on the topic, and we started to have the right network, but how could we tell this in a convincing story, and why would we tell this? In the end, we prepared an 'okayish' presentation on which we did not spend too much time. The visuals of our presentations were good, thanks to the great visual communications capabilities of the Dutch lady, and with the three of us we also came up with a good story line, but we still had no real purpose with our presentation.

Then, two days later, we arrived at the venue where all the new ventures would present for the last time during this summer course. The venue was beautiful, an old building transmitting a great vibe. Our team would be one of the last teams to present, at the end of the day. The first team presented a decent presentation, but I was shocked by the comments of the jury. The jury was only saying whether they liked the idea or not, but did not go into any depth about the content of the ideas. The comments and questions were quite superficial. At that moment, I told my two team mates: 'we are going to make sure that we have a proper discussion with the jury members.' In the two breaks throughout the day, we sat down and came up with some adjustments to our presentation, making some parts of our tetra pack idea intentionally vague, so the jury would have to ask clarifying questions. That would be the moment that we would really start the interaction.

In the end, we gave a good presentation, but more importantly, we actually engaged with the jury in a meaningful conversation. They connected to the 'hooks' we put in our presentation, and asked about production techniques and possible other applications. We took much longer than the assigned 10 minutes for questions, but the time keeper also noticed that a good discussion was going on, and did not stop us.

In the end, we did not win any of the awards, and that was okay. I felt relieved that I managed to have some insightful discussions with the members of the jury. Maybe being an entrepreneur would not be so bad after all if I could manage to engage in meaningful conversations with others instead of them being only just enthusiastic about the idea.

The Reflection: At first glance, the text seems like a typical entrepreneurial story; something goes wrong, there is a moment of doubt, and in the end, it works out well. But, there is a deeper insight

embedded in this story. To come to this insight, I will first reflect on the overall process that I went through throughout this summer course and relate that to my earlier findings. The notion of not knowing why and how to create a useful pitch can be described as a design problem, that I also explored in chapter 5. I argued how the business proposition development process for a new venture creation can be described as combined activities of Initiating, Designing, Engineering and Realizing (IDER). I also argued that all four activities take place at any moment of the development process. Hence, entrepreneurs are dealing with design problems at every moment of the business proposition development process. My experiences of developing the business proposition, the design activities and dealing with design problems applied to the development of our Tetrapak concept. At the start, I hardly knew what a Tetra pack was. I learned about it and then my teammates and I explored possible recycling methods and promising applications. There was a clear way of working with both the problem and the solutions simultaneously, hence designing. Similarly, there are several Initiating, Engineering and Realising activities. I could use a similar research method as in chapter 5 to identify what kind of IDER visualisation represents our process. However, in the situation described in the text, I experienced that I was also engaged in multiple design activities. The business proposition itself that I presented did not change, but the way how I related to the business proposition at that moment did change. The 'solution' of having a meaningful conversation with the members of the jury appeared before having a clear understanding of what to present. By re-defining the solution and problem, I obtained a deeper insight in the role that I want to have in the entrepreneurial process at that moment in time, namely, being involved in meaningful conversations with jury members. The notion of meaningful conversations relates to the reflection on the first and second texts, where I took up the notion of Stacey's (2007) sense making

in local interactions. One could argue that preparing the presentation for the pitch was a social activity that I engaged in together with my group, which would be in line with the work of Stacey (2007). However, the text also illustrates how the process was mainly a personal activity for myself. The text describes elements of 'designerly thinking' that I went through at that moment in time to change the purpose of what I wanted to achieve in a discussion. This notion is important, because this kind of 'designerly thinking' did not show up in chapter 5. The study in chapter 5 focused merely on activities that had a direct implication for changes of the business proposition (which was also in line with the main question asked in the interviews: *"How and by what activities did the business proposition evolve?").*

The study in chapter 6 allowed for a better understanding and appreciation of activities that did not directly influence the evolvement of the business proposition. Building on the work of Bucciarelli (1988) and Buur and Larsen (2010) allowed to understand the development of the business proposition in a social context. In such a social context, the notions of 'goals' or 'purposes' of several individuals is more obvious, because they are supporting and conflicting with each other all the time and thus were included in the analysis. Hence, I concluded in that study that one of the qualities of entrepreneurial design conversation is that *'student goals are enabling constraints for entrepreneurial goals'*. This third text explores that entrepreneurial goals or purposes are constantly changing based on the interactions with others. In the situation that I describe I did not have a clear 'student goal' that I was working with, but still being in the situation with the jury enabled me to adept my entrepreneurial purpose. I would argue that the development of the entrepreneurial purpose or goal might be more complex than I explored in the second study, and it is worth it for entrepreneurial students to explore since it can help them to regain confidence and please of their business proposition development process.

7.5 Reflections on the three texts

The three texts have an overarching theme in providing deeper insights into what it means for an individual (me) to be faced with a general understanding on how the business proposition development process should be. When talking about business propositions and new ventures, people often consider what Lyotard (1984) calls *the grand narrative:* that what is commonly believed by the population. New venture creation is good, new business propositions drive the economy, and new venture creation is something that should have an embedded role in our education system. Those are the common beliefs that we as entrepreneurial scholars and practitioners are faced with, and this is also what I contributed to in chapter 5 and 6. Presenting everyday experiences of starting a new venture and developing a business proposition provides an image of the struggle of what is going on in the midst of this process. The elements of what is really going on are elements that cannot be captured in general and distinct prescriptive models, so that they describe all entrepreneurial process and only entrepreneurial processes. I found myself in situations where I knew the main theory on the topic (from the entrepreneurial literature, and from the outcomes of the studies in chapter 5 and 6) but still, my experiences 'in the wild' could not always be explained by entrepreneurial theories or previous outcomes. Hence, I wrote autoethnographic texts to search for a better understanding. This search was useful for myself, since it gave me a better design perspective on entrepreneurial understanding.

All three texts are realistic tales (van Maanen, 1988). Especially in comparison to the first and second study, the three texts are more precise descriptions of what happened during several instances in the business proposition development process. All the three texts describe over the length of several pages instances over the timespan

of a couple of hours at maximum. Since the texts are written and rewritten, they provide a more detailed and realistic description then would have been possible in study 1 and 2. Furthermore, especially the first text has elements that are confessional (van Maanen, 1988). I explain how I would like to work together with a woman and I figure out that she has no interest in that. This was not an important turning point in the business proposition development process, but it does illustrate how I personally experienced this situation. The third text also has confessional elements, when I state that I do not feel like an entrepreneur. This confession allows to explore how the purpose of the business proposition development process changed.

Finally, after reading the texts again myself, I find that all texts are mostly impressionist tales (van Maanen, 1988). Forming the team based on a cooking conversation, meeting the Dutch professor and engaging in a different kind of conversation with the jury members highlight all memorable moments. They are memorable moments for me for two reasons. First, they all helped to move forward the business proposition development process into new directions. Second, this development took place in ways that I could not fully grasp by the outcomes of the first two studies. Therefore, the moments as described in the texts were memorable both from a researcher and practitioner perspective. Writing it down in these three texts gives other researchers and practitioners the opportunity to relate to my experiences. Linking the texts to theory ensures that they are no longer tales, but are embedded in the results and literature as discussed in chapter 5 and 6.

Concerning the content of the autoethnographic texts, I explored the similarities between the business proposition development process and design processes. I build on the findings of chapter 5 and 6 and mainly on the work of Stacey (2007), Dorst & Cross (2001), van Oorschot & Gottlieb (2015). A main theme that came up in my writings in this study

is how new ventures can be understood as a sum of interactions between those involved at a specific moment in time. It is in the interaction between the actors that new meaning is emerging, which helps the new venture creation process to move forward in often unexpected ways. Furthermore, this 'creation of meaning' can be described as a design activity. Building on the findings of chapter 5, I explored how design activities runs through the whole process of creating the business proposition and the new venture, but are also identified in ways that did not show up in chapter 5. Once an entrepreneur experiences the business proposition development process in real-life, it often seems richer than the IDER model could describe. Text 1 is therefore somehow surprising in relation to what I investigated in chapter 5. From that study, I know what a 'good' development process could looks like, but still I find myself involved in activities that seem like a mini IDER process and therefore drive the business proposition forward. Text 2 is mostly in line with findings from chapter 6, and explores in more detail the notion of a temporal organisation. Text 3 recognizes the results from both chapter 5 and 6. However, by describing a new situation, I was able to combine insides from both chapter 5 and 6. The aim of the texts is not to generalise certain elements of the text so that they are applicable to each and every business proposition development process. Instead, the texts illustrate how the findings of this study support or conflict with the findings of the studies in chapters 5 and 6. The texts of this present study provide examples of how student entrepreneurs experience the different design processes as embedded in the business proposition development process. The three texts, and the relation between the three texts, contain elements that other entrepreneurial researchers and practitioners can relate to. Some of these elements are specified in the reflections on the texts, other elements still exist in the richness of the description of the text. Hence, the autoethnographic text is also the part of the conclusion of the research (Chang, 2008). Readers can take up the

whole text and use it as input for new autoethnographic research. The challenge for other scholars is to find similar, different and overlapping elements in their own entrepreneurial practice. Therefore, this study, and the comparison between autoethnographic texts, act as an example for other entrepreneurship researchers on how to link their own autoethnographic research to conflicting or confirming research they undertook in earlier research projects.

7.6 Conclusions and Implications

To fully understand how the design and entrepreneurial processes interact with each other in education, we need researchers who are willing to step into the shoes of the student entrepreneur. They have to personally experience the new venture creation process and the business proposition development process, and then write confessional or impressionist tales, instead of trying to generalize their experiences. Especially the work of Stacey (2015) in the field of organizational processes offers a useful research framework, since it illustrates how to understand organizations as local interactions between actors, and how to explore this organizational understanding using autoethnographic methods. The notions of designerly thinking and design as a social process can be useful in the business proposition development in new venture creation as chapters 5 and 6 investigated. To fully understand the business proposition development process, I would argue that the 'little nuances' in design activities of how design activities are experienced by entrepreneurs could not be obtained by interviewing entrepreneurs or analysing video recordings of coaching sessions (as I did in study 1 and 2). It is in the process of writing and rewriting and constantly reflecting on the texts that the 'little nuances' become clear. This process shows that the experienced design activities in the process of business proposition development are often more emotional than I

captured in the previous two studies.

Therefore, the research in this chapter also contributes to entrepreneurship education. The research of this article took place in the context of a summer course with the aim to develop a new venture. The new venture creation process I went through is both a 'real life' entrepreneurial process and simultaneously an educational exercise. In my daily practice as an entrepreneurial educator, I often experience the thin line between what my students do within the frame of the course, and what they do for their new venture, as explored in chapter 6. Autoethnography is a good method to capture the education 'through' entrepreneurship learning activities. This study functions also as an example on how the autoethnographic method could be used by students to make sense of the new venture creation and business proposition development process they go through, and broaden their learning to a more general level. This is especially applicable for the Master of Science level, where students are expected to not only work on their venture, but do this using scientific tools and techniques. Using autoethnography would allow students to stay closely connected to their everyday life experiences, while learning on an academic level.

To conclude, I get back to Gartner's earlier mentioned quote on how he concluded his article with a call for more autoethnographic research*: I feel a shift in the momentum of how we, as scholars looking at entrepreneurship, seek to understand it. But, I'm still in a dark wood.* (Gartner, 2001 p16). Doing research such as in this chapter in which researchers themselves engage in the new venture creation process and write realistic, confessional and impressionist tales about the process, helps us as an academic field to create a better understanding on the new venture creation process. Whereas 'own experiences' are often left outside the scope of a research contribution, or merely used to start a research project, this chapter illustrated that own experiences can

add value to existing research outcomes that are acquired using more traditional research methods. It is especially in bridging fields such as entrepreneurship and design that own experiences support to find deeper understandings. I drew the connection between entrepreneurial processes and design processes but I invite other researchers with a different background to take up the autoethnographic method and explore how the business proposition development process in new venture creation relates to processes that they are familiar with in their fields.

Scholars can undertake the task of autoethnographic writing, but also for students there is a role. By writing autoethnographic accounts students and educators do not only contribute to the academic understanding of new venture creation, it is also a fruitful way for students to reflect on their learning experiences, and for educators to assess them. The research in this chapter is not the beginning of this search, several entrepreneurial authors have written about autoethnographic accounts before, neither is it the end, but rather an attempt in the midst of the momentum shift of academic scholars to get a better grip on the business proposition development process in new venture creation as understood as embedded design activities.

This chapter is an adaptation of

Van Oorschot, R. & Smulders, F. (2018). Participatory Entrepreneurship Education. In Proceedings of the 4th Participatory Innovation Conference (p 407-410).

The deconstruction has begun
Time for me to fall apart

The Deconstruction, Eels, 2018

8. Conclusions and implications

This thesis investigated how different design perspectives offer new insights to better understand and educate the business proposition development process in new high-tech ventures. The previous three chapters (chapters 5, 6 and 7) described three empirical studies. This present chapter will integrate the findings and conclusions of these three studies and relate them to theory and practice. This will illustrate the implications for entrepreneurship and design research, entrepreneurship education and entrepreneurial practice.

8.1 Relations between the three studies

This thesis aimed to answer how 'design' can improve the understanding and education of the business proposition development process in new high-tech venture creation. To answer this question, I did three empirical studies. This section will describe the relations between the three empirical studies.

In the first study (chapter 5), I investigated how entrepreneurs are using (or could use) designerly thinking as embedded activity

throughout the business proposition development process. I used the IDER model (Smulders, 2014) as a lens to investigate the activities of ten new high-tech ventures and categorised how the activities changed over time, using the IDER logic. From the analysis, I identified three IDER patterns. Some new ventures follow a smooth IDER pattern, some ventures follow a Wiggle IDERpattern and some ventures show an R drop in their IDER activities (Figure 8.1).

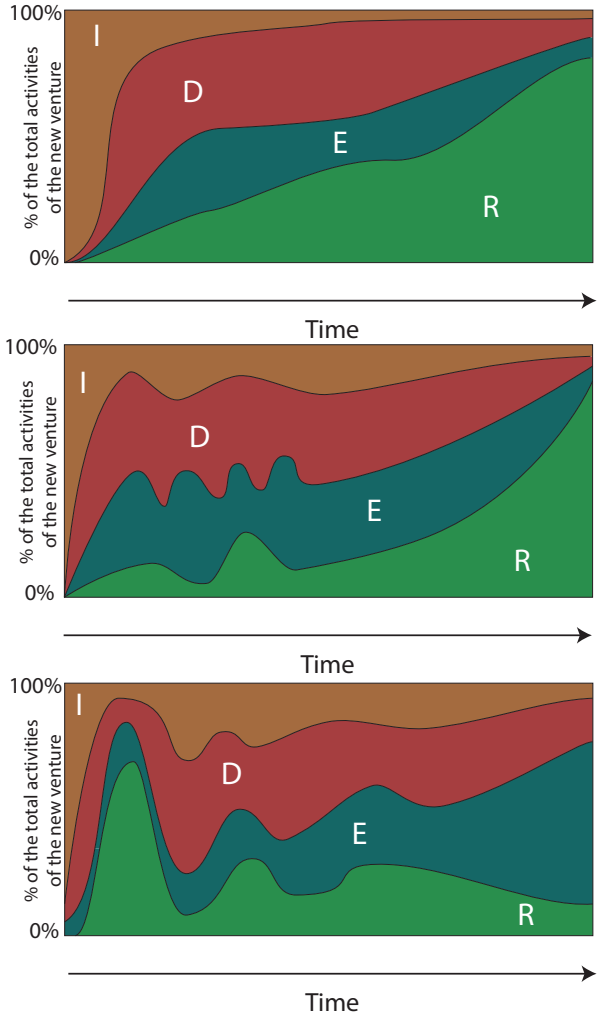

Figure 8.1: An example of a smooth IDER pattern (up), a wiggle pattern (middle) and an R drop pattern (down).

Both the smooth IDER and the Wiggle IDER come with their advantages and requirements, and for both patterns there is the trap to experience an R drop (Table 8.1).

	Smooth IDER	**Wiggle IDER**
Advantages	Smooth development with little change in activities.	Wiggles are a way to test the business proposition with the aim to improve its quality.
Requirements	The new ventures need to have readily available proposition knowledge and skills.	Wiggles require a financial investment and/or longer time spans with no immediate financial return.
Possible threat	**R drop** R drops appear as an unintended wiggle in which the new venture is forced to engage in new I, D and/or E activities that were unforeseen.	

Table 8.1 The Advantages and disadvantages of the Smooth and Wiggle IDER. For both patterns there is always the threat of the R drop

The first study investigated that the designerly thinking activities, as embedded in the IDER activities, take place throughout the whole business proposition development process. The challenge for entrepreneurs is to find the balance between designerly thinking activities and other entrepreneurial activities. The described IDER patterns provide guidance in this process.

In the second study (chapter 6), I investigated how entrepreneurial educators and students are involved in the social process of designing a business proposition. I assessed video recordings of, and reflections on coaching sessions of the MSc-level course Clean Tech Launchpad in which I was an educator and coach. I used the construct of 'quality of conversation' (Buur and Larsen, 2010) as a lens, to assess how designing

as a social process takes places in the context of entrepreneurial education. The study found that *qualities of entrepreneurial design conversation* mean that:

1. Coaching happens both on the IDER process and on the IDER content

2. Coaches take up both the role of expert and user and allow to be challenged by the students

3. Students try out new roles while discussing their experiences with the coaches

4. Student goals are enabling constraints for entrepreneurial goals

5. Financial discussions facilitate business proposition development

The findings of this second study relate to the first study both in supporting and opposing ways. The focus in the second study was to understand how designing happens in interaction between students (entrepreneurs) and educators, while the first study only took in consideration how a single entrepreneur 'designs'. Furthermore, the first study investigated first indications that designing the business proposition is more than just designing 'the product', but that designing takes place throughout the whole new venture creation process. The second study developed this understanding. By taking a perspective of sense making in complex responsive processes (Stacey, 2015), the five *qualities of entrepreneurial design conversation* illustrate that developing the business proposition strongly relates to what takes place in the social interaction between coaches and students. The first study focused on constantly (re)designing 'the business proposition' (which was embodied by more than just the product). The second study illustrates that from a social perspective, discussions, perspectives, roles and goals are constantly 'designed' and that in this complex process, the business

proposition develops.

Finally, in the third study, I investigated from an autoethnographic perspective how design activities manifest themselves to an entrepreneurial student. I wrote three autoethnographic texts that all had elements of realistic, confessional and impressionist tales (van Maanen, 1988). In these texts, I investigated three main themes. First, I explored how the very early stages of the business proposition development process can be understood as emerging interdependencies (van Oorschot & Gottlieb, 2015). Second, I explored how the IDER logic is embedded in itself. Throughout the IDER process of developing the business proposition, I identified 'mini IDER processes' that stand on their own but are also part of the larger process. Finally, I explored how the purpose of the business proposition development process changes together with the actual business proposition. Hence, both the business proposition and the purpose of the business proposition are designed.

The third study emphasises that the several design perspectives that a researcher can take to describe the business proposition development process, are still experienced in different ways by entrepreneurial students. Describing the 'mini IDER' processes provided more depth to the findings of the first study. Instead of providing one large IDER visualisation for the overall business proposition development process, it might be useful to address shorter instances using the IDER logic as well. Similarly, the descriptions of 'emerging interdependencies' and 'the development of the purpose' provided more depth to the understanding of the business proposition development as a social design process than the *five qualities of entrepreneurial design conversation* could provide. The descriptions above summarise the findings of the third study but it is important to stress that the autoethnographic texts in full are also part of the conclusion of the research (Chang, 2008). The value of autoethnographic research is in the full texts. Readers can take up

the texts and use it as input for new (autoethnographic) research. The challenge for other scholars is to find similar, different and overlapping elements by describing how the design and entrepreneurial processes relate to each other.

8.2 Contribution to Entrepreneurial processes and activities

The work in this thesis provides new insights into how the business proposition development process for new high-tech ventures looks like. The field of entrepreneurship research has, for a long time, been dominated by research from a positivistic and economic approach (Pittaway, 2005). Moroz and Hindle (2012) proposed to understand the new venture creation process as a general and distinct process, in order to better isolate how entrepreneurial processes are unique. The definition of Dimov of the opportunity as a creative product as: *the progress (idea + action) along a continuum ranging from an initial insight to a fully shaped idea about starting and operating a business*' has most appreciated the creative nature of the business proposition development process. Especially the work of Sarasvathy (2009) on Effectuation introduced a shift in the thinking about new venture creation processes by addressing how entrepreneurial actions lead to unknown outcomes.

By using *the IDER model* and the construct of *quality of conversation* as lenses, I explored how the business proposition development process contains embedded design activities. The two approaches appreciated that design activities are suited to deal with the uncertainties and unknown outcomes as Sarasvathy (2009) addresses them. Simultaneously, by stressing the embeddedness of the design activities, I argued that design activities alone would not be enough to develop a business proposition; design activities are embedded in a wider range of other activities. Some writers on *design thinking* might argue that design could be a solution for all kind of problems. I would stress the important of the embeddedness of design activities to provide solutions.

Furthermore, the first study (Chapter 5) on variations of the IDER model illustrates how a generic model can allow for situational manifestations. It is especially the designerly qualities of visualising processes that allow to communicate the situational processes of new high-tech ventures. This is useful in both theory and practice. I oppose Moroz and Hindle (2012) by stating that it might not be needed to have a model that describes the new venture creation process in a generic and distinct way, so that it describes *all* entrepreneurial processes and *only* entrepreneurial processes. By using the IDER model, I developed the understanding that the model itself might not be generic and distinct, but the situational manifestations are.

Since this 'design approach' takes such a fundamentally different approach to understanding the entrepreneurial process, it would be worth it to investigate it in more depth. The academic field of entrepreneurship is still a field under development, and the design perspective deserves a more prominent role in this development. Therefore, the model that Deakins and Freel (2003) introduced, is adapted to appreciate the impact of the design perspective on the education of entrepreneurship. In the new model, the social behavioural perspective is divided in a perspective focusing on 'pure research' and a perspective focusing on 'practice and education' (Figure 8.2).

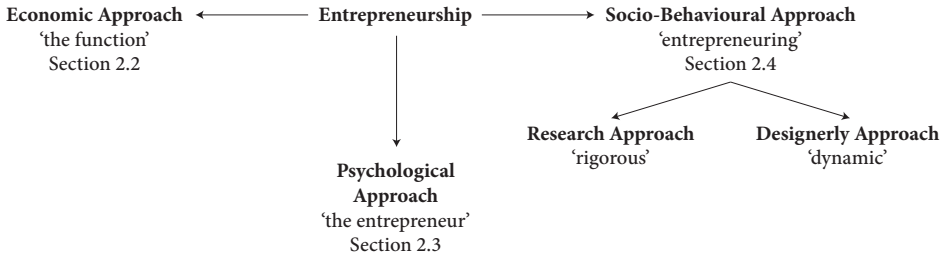

Figure 8.2: Dividing the Socio-Behavioural approach into two: a research approach to reach a rigorous understanding and a designerly approach to research a dynamic understanding suitable for education.

Sarasvathy's (2009) Effectuation already signalled a separation to understand the entrepreneurial process in a more dynamic way. Furthermore, entrepreneurial students use practical process models such as the Lean Start-up (Ries, 2011) and Customer Validation (Blank, 2012), since they have direct practical implications. However, these models are hardly grounded in theory.

I call this the designerly approach, with the aim to develop dynamic models, suitable for entrepreneurial education and practice. A design approach offers possibilities to develop more insights into the entrepreneurial process that can directly be taken up in education, while still having a strong foundation in design theory. In parallel, research could be undertaken in connection to what Moroz and Hindle (2012) propose, to develop distinct and general models to build a rigorous understanding of entrepreneurship as academic construct. I call this the research approach, truly focusing on knowledge creation with the aim to build even stronger fundaments of entrepreneurship as a field.

Combined, these efforts will lead to an academic field of entrepreneurship that has both a strong rigours foundation and can be educated and practiced. As the work in this thesis explored, the designerly approach is especially suitable to develop the understanding of the entrepreneurial process in education through entrepreneurship.

The direct practical contribution of this thesis is that the IDER model is a new 'visual language'. Entrepreneurs can show clients, partners, educators and other stakeholders what kind of processes they go through. Because of the generic qualities of the IDER model, other stakeholders can relate to the specific model of the entrepreneur. Therefore, they can discuss potential improvements on the business proposition development process.

Furthermore, the third study suggested that there might be embedded IDER processes within the larger IDER process. This realisation of deep embeddedness of activities is useful because it stresses how the development process of the business proposition might not be a straightforward process from 'initial insights to fully shaped idea'. Entrepreneurial activities serve not only the purpose of directly developing the business proposition, but are simultaneously also developing the roles, goals and relations of the entrepreneurs. Separating the activities for different purposes is impossible, because of its deep embedded nature. Taking several design lenses offered different perspectives to make sense of the complex process and offered insights in an attempt to better define what a business proposition could be.

8.3 Contribution to Entrepreneurial Education

By introducing different perspectives on embedded design processes, this thesis builds on the work of Glen et al. (2014) in which design logic enriches entrepreneurship education. By taking different perspectives on the activity of design, the studies contribute to different area's of Middleton and Donnellon's knowledge framework on entrepreneurial action in education (Figure 8.3).

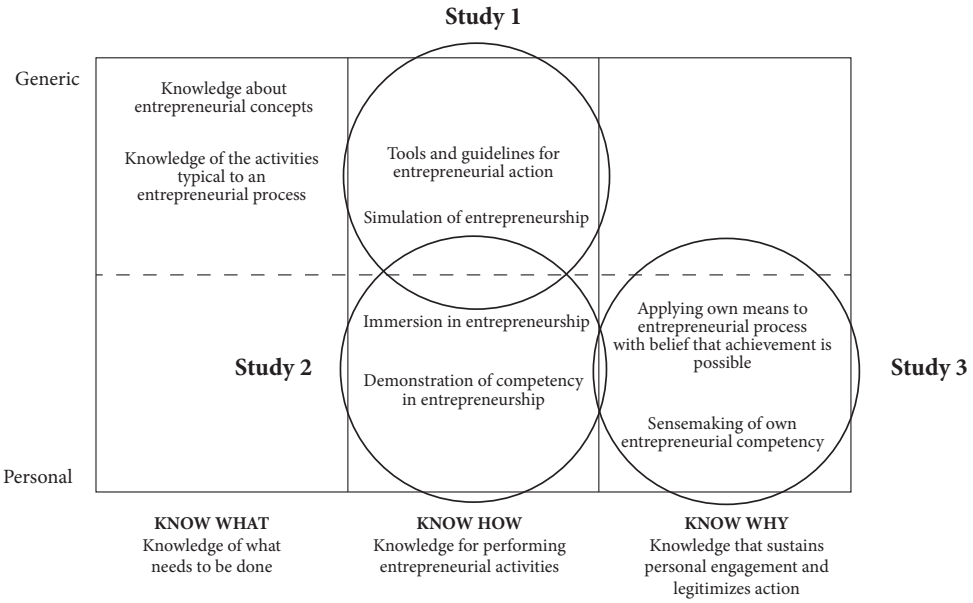

Figure 8.3: Knowledge framework on entrepreneurial action in education (Middleton & Donnellon, 2014)

Study 1 (chapter 5) contributes to generic knowledge for performing entrepreneurial activities. For educators, the IDER model offers tools and guidelines to discuss how the students can engage in different kind of processes of entrepreneurial activities. The different IDER patterns illustrate that design activities have different functions. The combination of the generic and temporal qualities of the IDER model offer educators and students starting points to discuss a personalised business proposition development process for each new venture. The findings

described in chapter 5 are generic in nature and offer possibilities to be adapted to the personal situation of entrepreneurial students.

In study 2 (chapter 6), the construct of '*qualities of entrepreneurial design conversation*' offers guidelines about how conversations in coaching session between entrepreneurial educators and students develop the business proposition. The work of Stacey (2007) on sense making in complex responsive processes and the work of Bucciarelli (1988) on design as a social process, offered new perspectives on understanding the business proposition development process as interactions between students and educators. Even more than in the 'creation view' on entrepreneurial opportunities, the work of Stacey and Bucciarelli stresses how the development of the business proposition *only* takes place in interaction. This notion is useful for educators because it allows for them to pay attention to how conversations, goals and roles are constantly changing in interaction. These specific insights contribute to the Personal – Know How cell in Figure 8.5.

Finally, study 3 (chapter 7) is an example of 'sense making of own entrepreneurial competences'. Especially writing autoethnographic texts can help students to assess for themselves how and why they engage in design activities at certain moments in their development process. These findings were exploratory and only introduced the value of autoethnographic research to entrepreneurship education. Therefore, this approach needs the most further research as I will describe in section 8.5. The findings of the third study offered a framework for writing autoethnographic text in which sensemaking of one's own entrepreneurial comptencies is possible.

Overall, the findings in this thesis assist educators how students could use embedded design activities throughout their educational process. The 'design thinking' tradition has illustrated that designing is not so easily fully taken up by those not educated as designers. This thesis has

explored that entrepreneurship education should not be replaced by design education, but different design perspectives are useful to fulfil the aims of the different cells of Middleton and Donnellon's framework. Simply 'adding Design Thinking' to entrepreneurship education does not provide the necessary understanding for student and educators in the process of business proposition development. Instead, by breaking down design activities into 'designerly thinking' and 'design as a social process' and stress the embeddedness of design activities, the studies addressed the various challenges on both a personal and general level.

The second main contribution of the work in this thesis is a better understanding of what education through entrepreneurship means. Although the notion of education through entrepreneurship is known in theory, it is still poorly taken up in educational practice. Entrepreneurial students can only learn through their entrepreneurial activities when educators allow students to make constant changes in their activities. I refer back to the quote of Vesper (1999) that I highlighted in chapter 2: *So far [entrepreneurship education] has largely been tucked in around the existing core. Its teachers presently must be approved by established faculty of other fields. Its courses currently must fit into the existing curriculum, grading system and calendar. It serves the students who for the most part apply for a conventional business education.*

The struggle that Vesper points out is still present today. Approaching education through entrepreneurial activities is still hard to justify to the existing curriculum where control over the learning is preferred by the educators. Especially my work in the second and third study illustrate the value of understanding business proposition development as a social process in which interactions between entrepreneurial students and coaching shape both the education and the learning.

Building on the perspective of design as a social process, I propose that entrepreneurship through education means that education happens

in interaction between educators and students around the real-life development of the business proposition. Learning happens in the social process of designing in coaching sessions with students and coaches. The work on *qualities of entrepreneurial design conversation* offers a thorough foundation that through coaching conversations, education through entrepreneurship is a fruitful way to fit it into the existing curriculum.

This change in perspective is relevant as theoretical construct but has even more impact in the practice of how entrepreneurial education programs could look like. Looking at the majority of entrepreneurship educations, they still focus on the very early stage of the entrepreneurial education, which is mostly the business proposition recognition. Just identifying a business proposition is in itself not an entrepreneurial activity; it is done in design and innovation education as well.

It is only in the next steps of developing the business proposition that an entrepreneurial process is different from an innovation process. However, these next steps are often only taught in theory (Middleton & Donnellon, 2014) and students only apply this knowledge to a limited extend in practice. The work in this thesis explored that embedded design activities can support entrepreneurial students in the phase after the initial business proposition recognition. I would advise the Delft University of Technology, and all other entrepreneurial minded universities around the world, to use a design approach not *to come up* with the business proposition, but rather *to develop* the business proposition once it is first recognised.

To make this change, there is not only a role for universities in changing their education but also for policy makers on a national level. By employing an approach of entrepreneurship education through design, universities have the potential to take up some of the development tasks of the entrepreneurial incubators, like YES!Delft.

In chapter 2, I explained how institutes like YES!Delft Student are responsible for to encourage entrepreneurship to students. TU Delft then educates the students, so that the students can execute their new venture in YES!Delft. Based on the exploration in this thesis, I would suggest that the TU Delft could take up some of these executing activities as well (Figure 8.4). In this new model, (student) entrepreneurs will already be further in their development once they enter an incubator like YES!Delft.

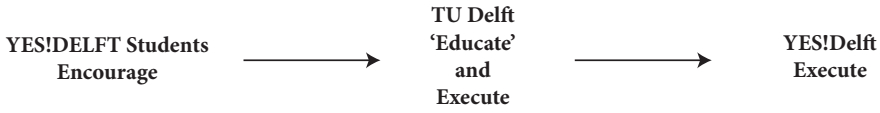

Figure 8.4: By taking up a design approach, the TU Delft does not only educate entrepreneurial students, but also assists these students to execute their business proposition

To make this to work, governments have to assign part of the budget that now goes to incubators, to universities instead, with the aim to support entrepreneurship education through design.

In continuation, I found that one of the most challenging issues for entrepreneurial educators is how to assess entrepreneurial learning of students. This relates to the elements of entrepreneurial becoming (Nielsen and Gartner, 2017). If we appreciate that students learn through entrepreneurial activities, then when is it that a student 'fulfilled' the learning objectives of an entrepreneurial course. A student who worked for two years on a business proposition and had constant interaction with educators learned something, even if the business proposition 'fails' after two years. But also, if the business proposition of a student succeeds after one month of work, it does not necessarily mean that the student also learned why this was a good business proposition development process; the student might have been 'lucky'. It is especially in autoethnographic writing that students can make sense of their own entrepreneurial competences. The findings of chapter 5

and 6 offer good starting points to write their autoethnographic texts. Students could ask themselves questions like: which IDER model am I planning to follow? When a change in IDER activities happens, how can I explain this? How does my IDER process throughout the education compare to the process I had planned? Similarly, students can reflect which 'qualities of conversation' are encountered in their conversations with educators (or with other stakeholders). Taking the understanding of education through entrepreneurship gives responsibility to students to determine how they want educational conversations to develop. Hence, students reflect on their experiences and how certain qualities of conversation come about. The considerations described above provide a robust perspective on assessing the learning of the students that goes beyond the success of their business proposition.

8.4 Contribution to 'Design' processes and activities

The heading of this section puts design between quotations marks to highlight the wider range of design research and practice and its overlap with other fields. Chapter 3 introduced a matrix to map different schools of thought in design research. I differentiate between design(erly) thinking and design as a social process on the one hand, and design processes and embedded design processes on the other hand (Table 8.2).

	Design Process Designing	**Embedded Design process** Designing
Design(erly) Thinking 	How and what a 'designer' does while merely designing	How and what a 'designer' does while designing as one of the activities in an overall 'innovation' process
Design as a Social Process 	How and what happens in interaction between designers and non-designers while merely designing	How and what happens in interaction between designers and non-designers while designing as one of the activities in an overall 'innovation' process

Table 8.2: Matrix to the different design perspectives as explored in this thesis

Throughout this thesis, Table 8.2 was used to define for the different studies which design view was used as a research lens. However, the application of this matrix goes beyond the use of research on the business proposition in new venture creation processes. As Johansson-Sköldberg et al. (2013) point out as the biggest challenges of Design Thinking: "*Design thinking is often equated to creativity: Sometimes the popular version 'design thinking' is presented as a way to make managers think more creatively. But being creative is only part of the competence and practice of the designer's work.*" *(Johansson-Sköldberg et al., 2013, p. 131)* and, *"Design thinking is often equated to a toolbox: Sometimes the popular versions focus on the designer's specific methods taken out of context, as tools ready for use, but the person using the tools must have the knowledge and skill – competence that comes with training – to know when to use them (Johansson-Sköldberg et al., 2013, p. 132).*

Design researchers and practitioners are constantly struggling to find answers to these challenges. The matrix in Table 8.2 is a practical tool to researchers and practitioners to determine which view on 'design activities' they want to take. Chapter 3 offers a summary of the literature in the different cells and offers insights for both researchers and practitioners. Especially the differentiation between 'design processes' and 'embedded design processes' is useful for those researchers and practitioners who aim to bridge the gap between the field of design and neighbouring fields, to describe which function the design activities have in the overall process. It seems that design activities are best understood in their embedded nature in the overall creation process. The empirical studies illustrated that the value of including design activities in a creation process is diverse, depending on the context and actors involved. Choosing the appropriated design lens is essential to deepen the understand on how design activities can enrich the creation processes of neighbouring fields.

Finally, the work in chapter 5 has enriched the understanding of the IDER model (Smulders, 2014). The IDER model was selected as a lens because of its temporal and generic qualities. The coding of the interviews (Appendix 1) enrichid the vocabulary to describe what Initiating, Designing, Engineering and Realising means in the context of business proposition development processes. This vocabulary can be applied in the use of the IDER model for all kind of applications.

Overall, the findings in this thesis should be understood from the perspective that 'design' can indeed improve all kind of processes, and especially business proposition development process for new high-tech ventures. The big challenge for design researchers and practitioners is to be precise about which design perspective they want to take.

8.5 Limitations and suggestions for future research

The research in this thesis has been explorative and mostly descriptive. I chose on purpose to be personally involved in different ways in the three research projects that I undertook (Figure 8.5).

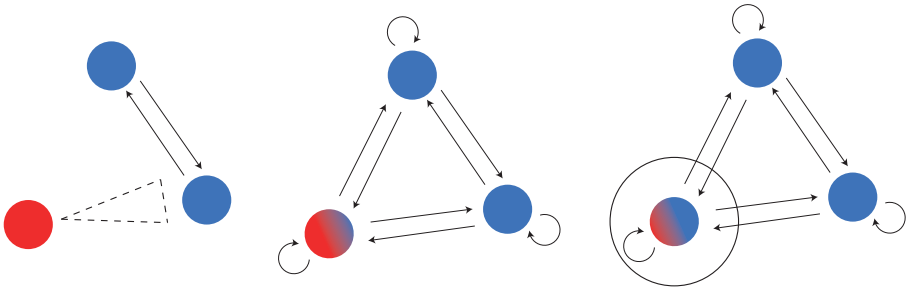

Figure 8.5: From left to right: the first picture illustrates how I (the red circle) took a detached perspective to make sense of the activities of the entrepreneur. The second picture illustrates that I (the red circle with a bit of blue) am part of activities together with entrepreneurs. The third picture illustrates that that I (the red/blue circle) am in the centre of entrepreneurial activities in social interaction with others.

The approaches taken in this thesis have implications for both the fields of entrepreneurship and design. As for every research project, there is the question how the researcher wants to approach the research process. The researcher needs to decide what his role in this process is (if any). The work in this thesis investigated three stages of 'involvedness'. Throughout the thesis project, I found that visualising the three approaches as in Figure 8.5 is clarifying for researchers at especially the MSc and PhD level. At the start of one's academic career, the amount of research perspectives to take can be overwhelming. To take an involved perspective requires courage, because the expected outcomes are almost always uncertain. Figure 8.5 assists to argue for methodological choices in research projects.

For this thesis, the three approaches resulted in rich and deep insights into different perspectives on how design activities enrich the understanding of the business proposition development process in new high-tech venture creation, which was previously poorly explored. These insights are however not very robust yet. The results of all three studies require further validation, and for each of the studies I will recommend several possibilities for further research.

For the first study, I recommend to collect more precise descriptions from a larger sample of new high-tech ventures. The study investigated the activities of ten new high-tech ventures over the period of four years. There were two data points and thus the descriptions of the entrepreneurs were (mostly) based on memory. I aimed to tackle this issue by introducing quotes from the first interview in the second interview. In this way, the descriptions of the entrepreneurs were more accurate. For future research, it would be important to capture the entrepreneurial activities over shorter time intervals, to ensure more accuracy. Study 1 has further specified the IDER terms while working with the data (Appendix A), which enhanced the explorative nature

of the study. With these new insights and specifications, it is possible to code larger data sets, capturing the activities of more high-tech entrepreneurs. A larger study could validate the different IDER patterns in more depth and based on these validations more accurate advice can be given to entrepreneurs and entrepreneurial educators on how to plan (the education of) the business proposition development process.

For the second study, I recommend two directions for future research. First, educational researchers could further explore the notion of quality of conversation in the context of their entrepreneurial conversations with students. I stated how the research methodology in this study values the activities of the researcher as part of the data. I invite other researchers to take the same perspective and see which similar or conflicting qualities of conversation they find. As a second direction for future research, the findings of this study could be verified. By investigating a larger sample of educators and students, it is valuable to verify, from a detached perspective, which of the five qualities of entrepreneurial design conversation are most common. How do e.g. group size, different backgrounds of students within a group or the different moments in the process relate to the five qualities of entrepreneurial design conversation? With this knowledge, educators could organise their entrepreneurial courses accordingly.

For the third study, I would recommend to investigate if it is possible to identify a general autoethnographic method that could be used by entrepreneurial students, or if an autoethnographic method is always context specific. I have explored different autoethnographic techniques in the third study and I have not been specific in choosing one method. This had as an advantage that the study is rich both in its data and research approach, but had as disadvantage that I cannot offer researchers and students one standard way of approaching this kind of research projects. Autoethnographic researchers would question

if it is possible at all to standardise an autoethnographic method, but for educational purposes it would be beneficial to make the effort. Once there is more clarity about which autoethnographic method students could use to make sense of their own business proposition development process, there is the possibility to use autoethnographic texts as main means of assessment of the entrepreneurial learning of students. In many entrepreneurial courses, reflective texts are now often an extra assignment next to a report, business model or other form of examination. It is in autoethnographic writing, that students can reflect on the embedded role of design activities and link their experiences to theory.

One overall recommendation is to include how to measure final success of the business proposition. The first study touches on how several IDER processes lead to successful outcomes, but overall the three studies have explored how embedded design activities have improved the *process* of developing the business proposition. The focus of this thesis has been on the early stage of this process, since design activities were normally associated with this stage. But this thesis found that different design activities have different roles throughout the *whole* business proposition development process. Therefore, a research question worth asking is: how do embedded design activities throughout the whole business proposition development process relate to the success of the business proposition?

Overall, there is still a lot unknown about the impact of design activities on (the education of) the business proposition development process. The exploration in this thesis offers a framework and first insights into how to connect design activities to the understanding and education of the business proposition development process that go beyond 'just applying design thinking'.

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Summary

This thesis takes the perspective that 'a design approach' might help to better understand and educate the business proposition development in new high-tech ventures. This has been observed at the faculty of Industrial Design Engineering at the Delft University of Technology, where design students (without an entrepreneurial education) start their new high-tech ventures. Furthermore, there are some implications in literature suggest that design improves entrepreneurship education. However, it is unknown what this design approach exactly is, and how and why it is helpful. This thesis will explore these questions.

In chapter 1, I define that I will understand entrepreneurship education as education 'through' entrepreneurship, and not as education 'about' or 'for' entrepreneurship. Students learn *through* their own real life entrepreneurial activities. It is the role of educators to guide them in this process.

In chapter 2, I assess the entrepreneurship (education) literature. I conclude that from an economic, psychological and socio-behavioural perspective it is not clear how to best understand and educate the business proposition development in new venture creation. Therefore, a design approach might actually provide new insights. Furthermore, I use a knowledge framework (Middleton & Donnellon, 2014) for entrepreneurship education which will provide guidance for my three empirical studies.

In chapter 3, I explore that in order the understanding and education the business proposition development process, a design approach can help. An often-used construct to apply 'design' in another field is called 'design thinking'. However, I conclude that the design thinking approach is too limited for the purpose of this thesis. Instead, I differentiate between 'designerly thinking' and 'design as a social process'. For both schools of thought I explore how they can be understood as 'design

processes' and as 'embedded design process'. For the different schools of thought I assess which constructs will be used in three empirical studies.

In chapter 4, I introduce three research methodologies: interviews and coding, sense making in complex responsive processes and autoethnography. For each approach, I explore how I want to use it in the empirical studies.

In the first study (chapter 5), I investigate how entrepreneurs are using (or could use) designerly thinking as embedded activity throughout the whole business proposition development process. I use the IDER model (initiating, designing, engineering and realising) (Smulders, 2014) to investigate changes in the activities of ten new high-tech ventures. From the analysis, I identify three IDER patterns. Some new ventures follow a smooth IDER pattern, some ventures follow a Wiggle IDER pattern and some ventures show an R-drop in their IDER activities.

In the second study (chapter 6), I investigate how entrepreneurial students and educators are involved in the social process of designing a business proposition. I analyse video recordings of, and reflections on, coaching sessions of the MSc-level course Clean Tech Launchpad in which I was an educator and coach myself. I use the construct of 'quality of conversation' (Buur and Larsen, 2010) to assess how designing as a social process takes places in the context of entrepreneurial education. The study found that *qualities of entrepreneurial design conversation* mean that:

1) Coaching happens both on the IDER process and on the IDER content

2) Coaches take up both the role of expert and user and allow to be challenged by the students

3) Students try out new roles while discussing their experiences with the coaches

4) Student goals are enabling constraints for entrepreneurial goals

5) Financial discussions facilitate business proposition development

In the third study (Chapter 7), I investigate from an autoethnographic perspective how design activities are experienced by an entrepreneurial student. Based on my experiences in a five-week entrepreneurial summer school, I have written three autoethnographic texts that all had elements of realistic, confessional and impressionist tales. In these texts, I investigated three main themes. First, I explore how the very early stages of the business proposition development process can be understood as emerging interdependencies. Second, I explore how the IDER logic is embedded in itself: throughout the IDER process of developing the business proposition, I identify 'mini IDER processes' that stand on their own but are also part of the larger process. Finally, I explore how the purpose of the business proposition development process changes together with the actual business proposition. Both the business proposition and the purpose of the business proposition are designed.

To conclude, in chapter 8, I explain that the design perspective helps to understand the business proposition development process in new high-tech ventures from a dynamic perspective. Therefore, a design approach would deserve its own section in the field of entrepreneurship research. Furthermore, I conclude that using a design approach helps to better apply the theoretical construct of 'education through entrepreneurship' and I give recommendations to universities about how to do this. As well, I address that understanding designing both as designerly thinking and as design as a social process, offers a framework to apply 'design' in other fields. Finally, I give recommendations for future research in entrepreneurship education through design.

Samenvatting

Dit proefschrift gaat er vanuit dat een 'ontwerpaanpak' kan helpen om de ontwikkeling van business proposities in nieuwe hi-tech bedrijven beter te begrijpen en te onderwijzen. Dit is waargenomen op de faculteit Industrieel Ontwerpen van de Technische Universiteit in Delft, waar studenten (zonder opleiding in ondernemerschap) een eigen high-tech bedrijven zijn gestart. Verder zijn er in de literatuur aanwijzingen te vinden dat 'de ontwerp discipline' ondernemerschapsonderwijs zou kunnen verbeteren. Het is echter onduidelijk wat deze ontwerpaanpak precies inhoud, en hoe en waarom deze nuttig is. Dit proefschrift gaat deze vragen onderzoeken.

In hoofdstuk 1 definieer ik dat ik ondernemerschapsonderwijs zie als onderwijs 'door' te ondernemen, en niet als onderwijs 'over' of 'voor' ondernemerschap. Studenten leren 'door' hun eigen, echte, ondernemerschapsactiviteiten. Het is de rol van de onderwijzer om studenten in dit proces te begeleiden.

In hoofdstuk 2 beoordeel ik de literatuur over ondernemerschaps(onderwijs). Ik concludeer dat er vanuit een economisch-, psychologisch- en sociaalgedragsperspectief geen duidelijke indicaties zijn hoe de ontwikkeling van business proposities in nieuwe high-tech bedrijven het best te begrijpen of te onderwijzen is. Een ontwerpaanpak zou daarom nieuwe inzichten kunnen geven. Verder gebruik ik een model (Middleton & Donnellon, 2014) voor ondernemerschapsonderwijs waarin mijn drie empirische studies geplaatst kunnen worden.

In hoofdstuk 3 onderzoek ik hoe een ontwerpaanpak kan helpen om het ontwikkelen van business proposities beter te begrijpen en te onderwijzen. Als ontwerpen wordt toegepast in een ander veld wordt

vaak het construct 'design thinking' gebruik. Ik concludeer echter dat een 'design thinking-aanpak' te gelimiteerd is voor het doel van deze thesis. Daarom maak ik een verschil tussen 'designerly thinking' (gefocust op het individu) en 'ontwerpen als sociaal proces' (gefocust op de interactie tussen individuen). Vervolgens maak ik voor beide stromingen, een onderscheid tussen het losstaande ontwerpproces en het ontwerpproces ingebed in een geheel. Zo onstaan er vier constructen waarvan ik beoordeel welke gebruikt kunnen worden in de drie empirische studies.

In hoofdstuk 4 introduceer ik drie onderzoeksaanpakken: interviewen en coderen, betekenis geven aan complexe responsieve processen en auto-etnografie. Voor elke aanpak onderzoek ik hoe ik deze wil gebruiken in de empirische studies.

In de eerste studie (hoofdstuk 5) onderzoek ik hoe ondernemers 'designerly thinking' gebruiken, of zouden kunnen gebruiken, gedurende de gehele ontwikkeling van business propositie. Ik gebruik het IDER-model (Initiating, Designing, Engineering and Realising) (Smulders, 2014) om veranderingen van activiteiten van tien nieuwe high-tech bedrijven te onderzoeken. Ik identificeer drie IDER-patronen, sommige bedrijven volgen een geleidelijk IDER patroon, andere volgen een 'wiggle' IDER patroon en sommige bedrijven hebben een 'R-drop' in hun IDER activiteiten.

In de tweede studie (hoofdstuk 6) onderzoek ik hoe ondernemende studenten en docenten betrokken zijn in het sociale proces van het ontwerpen van de business propositie. Ik analyseer video opnames van, en reflecties op, coaching sessies van het MSc vak Clean Tech Launchpad waarin ik docent en coach was. Ik gebruik het construct 'quality of conversation' (Buur and Larsen, 2010) om te beoordelen hoe ontwerpen als een sociaal proces plaatsvindt in de context van ondernemerschapsonderwijs. Uit deze studie blijkt dat 'qualties of

entrepreneurial design conversation' betekent dat:

1) Coaching over zowel het IDER proces als de IDER content gaat

2) Coaches nemen de rol aan van zowel de expert als de gebruiker en worden daarin uitgedaagd door studenten

3) Studenten nieuwe rollen uitproberen terwijl ze hun ervaringen bespreken met hun coaches

4) Studentendoelstellingen zowel stimulerend als hinderlijk tegelijk zijn voor ondernemersdoelstellingen

5) Financiële discussies de ontwikkeling van de business propositie faciliteren

In de derde studie (Hoofdstuk 7) onderzoek ik vanuit een auto-etnografisch perspectief hoe ontwerpen ervaren wordt door ondernemende studenten. Gebaseerd op mijn ervaringen in een zomercursus van vijf weken, heb ik drie auto-etnografische teksten geschreven die allemaal elementen bevatten van realistische, confessionele en impressionistische vertellingen. In deze teksten onderzoek ik drie thema's. Ten eerste onderzoek ik hoe de vroege fase van het ontwikkelen van de business propositie kan worden begrepen als 'emerging interdependencies'. Ten tweede onderzoek ik hoe de IDER-logica is ingebed in zichzelf. Gedurende het IDER-proces van de ontwikkeling van de business propositie, identificeer ik IDER-subprocessen die op zichzelf staan maar ook onderdeel zijn van het hoofdproces. Ten derde onderzoek ik hoe het doel van de ontwikkeling van de business propositie verandert samen met de business propositie zelf. Zowel de business propositie als het doel van de business propositie worden ontworpen.

Concluderend, in hoofdstuk 8, leg ik uit dat een ontwerp perspectief helpt om de ontwikkeling van de business propositie in nieuwe high-tech bedrijven beter te begrijpen vanuit een dynamisch perspectief. Daarom zou de ontwerpaanpak zijn eigen sectie verdienen

in het veld van ondernemerschapsonderzoek. Verder concludeer ik dat het gebruik van een ontwerpaanpak helpt in het beter toepassen van het theoretische construct 'onderwijs door te ondernemen en presenteer ik aanbevelingen voor universiteiten. Ik adresseer ook dat het onderscheiden van 'ontwerpen' in 'designerly thinking' en 'ontwerpen als sociaal proces' helpt om 'ontwerpen' in andere velden toe te passen. Afsluitend geef ik aanbevelingen voor verder onderzoek naar het gebruik van 'ontwerpen' voor ondernemerschapsonderwijs.

About the Author

Robin van Oorschot was born on April 30, 1989 in Eindhoven. Already from the age of 14, he was tutoring and teaching students, something he would continue doing over the years. He concluded his bachelor studies in Industrial Design in 2010 at the Eindhoven University of Technology. He took a semester of entrepreneurship courses and worked at a design consultancy, before he started his master studies in IT Product Design at the University of Southern Denmark, in Sønderborg. As part of that degree, Robin spent four months in Brazil, working at a service design company. After gaining his MSc degree, he worked for some time as innovation consultant. In 2014, Robin was hired by the faculty of Industrial Design Engineering of the Delft University of Technology to do his PhD research on Entrepreneurship Education from a design perspective. As the topic suggest, he was involved heavily in teaching activities next to his research activities.

Over the years, he lectured and presented his work all over the Netherlands, many places in Scandinavia, North America and Canada, Colombia and Brazil.

Currently, Robin works as a post-doc researcher in the research group Innovation, Design and Entrepreneurship at the Technical University of Denmark. He lives in Copenhagen together with his girlfriend, Anette and their son, Topias.

Remember, remember, the fifth of November
And all the support that I got
I know for no reason, why these marvellous people
Should ever be forgot
Adaptation of an English folk verse on Guy Fawkes

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Appendix A: Coding IDER

Coding scheme developed in study 1 (Chapter 5) to determine the IDER activities.

I	D	E	R
background	develop	validate	sale
start	transformation	choose a development and go all-in	sold
make goals	take a course	develop deep knowledge	bring knowledge to the market
A good starting point	apply something new	development activities	grow
first business card	visualise	make a technical drawing	taking over
to have a plan	to develop a market combination	first real test	the business starts to boom
experience as entrepreneur	really become aware	further development	just start to do sales
based on the idea	explore the market	electrical engineering	To market something
Initiated	goal for the concept	set up a protocol	to support the whole process
the idea	to select a profitable idea	to define in detail	To buy material for large production
learn something new	start to build	develop in detail with the customer	truly realisable
give live to an idea	think along with each other	to develop a tool for scaling up	sell a small assignment
to map out	to translate the wishes of the customer into	technically solve	really start to sell
interest	to develop a case	programmer	sell a part of
to convince investors	Solve	test	burn cash
market research	to get feedback from the client	build on existing knowledge	start to have turnover
market testing	make a first decision	to decide on the production process	first delivery
find people	focus	to develop software	we just have to make money!
network	develop	intervene	to deliver
come into existence	explore applications	technical CAD	invest a lot of money
educational background	ask questions	measure	large investment

establish	develop for the investors	the evolution of the technology	sell right away
plan	focus on	start to scale up	being done with it
list of basic requirments	work with the insights from customers	improve the technical aspects	first real client
arrange	make an estimate	develop in detail	scale up
get a sharp image of	choose a direction	do all development based on own knowledge	to launch the product
explore possibilities for subsidies	try out	reach the next level	give discount on a large batch
try out	create value for	develop deep knowhow	in the market
explore different lines of opportunity	draw	to transfer the development to	try to sell the company
vision	product or service?	this is how we develop	first launching customer
set requirements	connecting of ideas	use the knowledge of external parties	the production process
demand from industry	a switch in the way of thinking	a full-scale prototype	grow
what can we do with it	to develop the basics	make it efficient	really become a mature company
	the real design of	develop the details	have a patent
	develop the interest of	to link the design to software	to have a standard product
	really being curious	hard core development	we really have a product now
	translate insights into	make the next step in building	Work together with a retailer
	Link components to each other	screw things together	handle large orders
	Do a small-scale test	tested' in the wild'	This is engraved in stone now
	solve several problems simultaniously	Test in the lab	Work with large budgets
	Try to give advice	Give grounded and tested advice	atomise
	make changes	stabilise	give a discount on large orders
	combine changes	at a level of completion	

	get used to the newness	we start to have more obligations towards..	
	Really getting confronted with the newness	crystallise	
	develop the basic requirements	measure the effect	
	change between possibilities	define the technical boundaries	
	just fool around a bit with the idea	work with functional requirements	
	try out a first version	first step in scaling up	
	get expectations together	calculate	
	to plead	execute numerical simulations	
	to play around with options	integrate parts of third parties	
	to position yourself	prove	
	try out all kind of things		

And if a double-decker bus
Crashes into us
To die by your side
Is such a heavenly way to die

And if a ten-ton truck
Kills the both of us
To die by your side
Well, the pleasure - the privilege is mine

The Smiths, There is a light that never goes out, 1986