

# Confidence and Motivation in Design Thinking

Exploring the differences between seasoned and first time practitioners and their confidence in the process

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## ABSTRACT

With the increasing popularity and application of design thinking we also see an increase in the amount of first time practitioners from various professional and academic backgrounds. This paper set out to uncover the different gaps that may occur between the practitioner and the process, and how to narrow those gaps. Gaps can mean anything from doubts, questions, insecurities etc., that results in the practitioner distancing themselves from the process and in turn might lead to loss of motivation and drive.

Practitioners were divided into four different categories based on their previous experience with design thinking and then interviewed. The four principles of design thinking were used as the basis, in addition, a content analysis was done prior to the interview. The content gathered was closely related to the practitioner on a personal level and to skills and elements beneficial for design thinkers. A sample of 15 practitioners were interviewed in a semi structured, conversational form, one by one.

Central findings were that the the difference between having experience within the field of the problem you want to solve had less effect compared to the difference between having experience with the process or not.

Furthermore, the team plays a big role when it comes to the overall experience.

The team composition and dynamics can create great benefits for all the practitioners by for instance creating a creative environment to thrive in. This was especially true for the first timers. It can however work the opposite way as well, and the results suggest that for instance, one single team member could potentially drag the whole team down and create gaps for all the participants within that team. The ambiguity of the design thinking process played a big part when it came to creating gaps, this however varied depending on the practitioner's background and preference to problem solving. It was also uncovered that the iterative steps of the process and focusing on the process and not the outcome, could help the practitioners stay more connected to the design thinking process.

**KEYWORDS:** Design thinking, Experience, Practitioner satisfaction, Doubt, Skeptic, Creativity, Social skill, Confidence, Team, Atmosphere, Mindset

## 1. INTRODUCTION

Design thinking is becoming more and more adapted by people from different professional and academic backgrounds. Organizations from small start-ups all the way to large companies acknowledge the value it can create, both outcome related and also longer term effects on competences, innovation processes and mindset. [4]. Ideas like lean start up [1], customer development [2] and business model generation [3] are widely spread, implemented and share certain elements directly with design thinking.

Creating teams out of people with different backgrounds, also known as interdisciplinarity is an essential prerequisite for design thinking [5]. This is underlined by the basic principle of radical collaboration [6]. This means that in addition to having people with different backgrounds and perspectives on a team, it is also important to make sure that the whole team work together through the steps of the process. In other words, you do not want to divide up tasks based on what is most suitable for the members of the team. Interdisciplinarity and radical collaborations in practice leads to varying levels of experience and expertise with the process within the team. A lot of the practitioners may be first timers, come from backgrounds with a very different way of thinking and doing, or something in between.

The purpose of this paper is to explore the possible gaps created by the varying experience level of design thinking practitioners. By gaps we mean factors that distance the practitioner from the process. This can for instance happen when the practitioner start doubting the tools used, or they start to question the use of their time. The paper will be in the form of a directed content analysis followed by qualitative interviews of practitioners. The content analysis will consist of prior research and existing theory. The resources are collected from various fields and grouped into clusters. The resources will then be put up against the findings from the interviews and discussed.

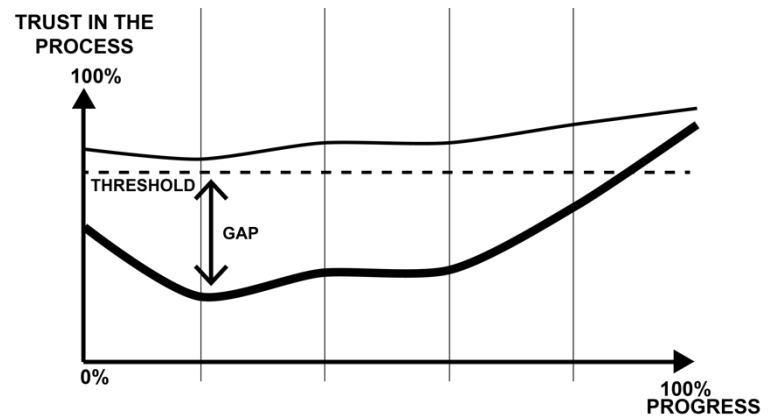


Figure 1 (Original): Illustrating the gap that can occur during the process. The threshold is for adapting design thinking and starting to use it yourself. The thick line illustrates first time practitioners while the thin line is for second time practitioners or more.

### 1.1 How the practitioner feels

This study will focus on how the practitioner feels regarding design thinking. More specifically we focus on their sense of trust towards the process and we will also try to uncover which aspects of design thinking are most likely to raise questions and by whom. The practitioner and their point of view is the priority of this study, meaning that the results from the stakeholders' point of view is less prioritized, unless it is directly linked to how the practitioner feels about design thinking. It is however safe to assume that the satisfaction of the practitioner and the satisfaction of the stakeholders including the end user, are correlated. After all, empathy towards the user is key in design thinking [7]

## 2. DESIGN THINKING TRAITS

The design thinking process is a structured process towards solving problems, creatively navigating through three constraints; 'feasibility', 'viability' and 'desirability' [5]. The process can be illustrated by for instance five iterative steps typical of the process, which are 'empathize', 'define', 'ideate', 'prototype' and 'test' [7]. This is one example of many and different

interpretations can be found all the way from containing seven steps [8], down to a simplified 4 step interpretation [9].

'Creativity', 'ambidextrous thinking', 'teamwork', 'user-centeredness', 'curiosity' and 'optimism' are traits listed as common for design thinking [11]. These traits will be further discussed throughout the different topics of this paper.

In 2010 researchers defined four principles to design thinking [12] which are:

- **The human rule** – all design activity is ultimately social in nature. Studies suggest that successful innovation through design thinking activities will always bring us back to the “human-centric point of view”. This is the imperative to solve technical problems in ways that satisfy human need and acknowledge the human element.
- **The ambiguity rule** – design thinkers must preserve ambiguity. “chance discovery” is not possible if the box is closed tightly. Innovation demands experimentation at the limits of our knowledge, at the limits of our ability to control events, and with freedom to see things differently.
- **The re-design rule** – all design is re-design. Because technology and social circumstances change constantly, it is imperative to understand how needs have been addressed in the past. We can then apply “foresight tools and methods” to better estimate social and technical conditions we will encounter in the future.
- **The tangibility rule** – making ideas tangible always facilitates communication. “Prototypes are communication media” and making them tangible opens up new possibilities. There is potentially more insight to be

gained by making something tangible than just writing the idea on paper and trying to explain it.

Those four principles will be used as a framework for this study including the interview.

## 2.1 Personal practitioner traits

This study's main purpose is to uncover gaps that may occur between the practitioner and the design thinking process. These gaps may be doubt, skepticism, insecurity etc., and may occur from previous experience, academic or professional background and mindset to name a few. Gaps in this context are things that lead to the practitioner distancing herself from the process.

We have the four principles of design thinking serving as a fundament in our mission to find these gaps, but we also need to connect the practitioner to these principles. We need to look even closer at the practitioner as an individual and see how different aspects of them, may affect how they view design thinking and the different steps and measures within the process.

We call these personal practitioner traits, and they will be used alongside the four principles to discuss the results of the interviews.

### 2.1.1 Creativity

There are a lot of different definitions to creativity, but Michael Mumford suggests that: 'creativity involves the production of novel, useful products' [18].

Dr. E. Paul Torrance describes creativity as: 'a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies and so on; identifying the difficulty; searching for solutions, making guesses or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results' [19].

Dr. E. Paul Torrance’s more detailed definition might seem more inline with creativity in design thinking, but Michael Mumford’s statement does not exclude creativity from design thinking either.

When connecting creativity to a personal level and looking at it as a trait, Jeff Dyer, Hal Gregersen & Clayton M. Christensen has done some interesting finds regarding what characterizes an innovator [20]. Through surveys of 500 innovators and 5000 executives in 75 countries and Interviews of inventors, founders and CEOs of innovative, game-changing companies they state that there are five discovery skills essential for innovation

‘Associating’, ‘Questioning’, ‘Observing’, ‘Networking’ and ‘Experimenting’.

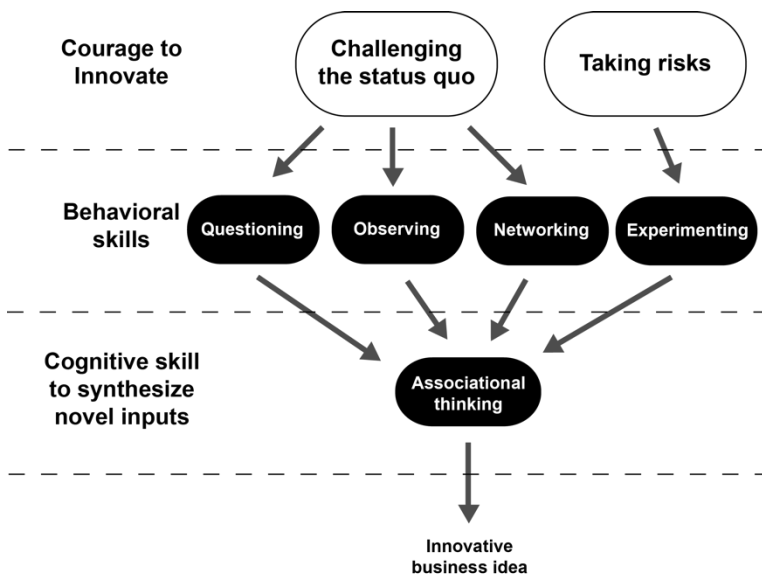


Figure 2: Five discovery skills from the innovators DNA [20]. Please note that all the figures in this paper have been remade in order to fit the format better. The original source will be referred to.

Based on the attributes we found for design thinking we see that they go together well, and do note that the ‘associational thinking’ skill is connected to the rest (see figure 2).

More interestingly Jeff Dyer, Hal Gregersen & Clayton M. Christensen are referring to research done by a group of researchers [21]. By studying creative abilities in 117 pairs of identical and fraternal twins, they found that only about 30% of the performance of identical twins on a battery of ten creativity tests could be attributed genetics. creativity is not a genetic trait, but something that can be acquired. Six other creativity studies of identical twins confirm this number and they point towards 25-40% of creativity attributed to genetics. [22]

So what does it take to become creative if it is not a genetic attribute. According to Teresa Amabile, there are three components to creativity [23]: ‘Expertise’, which is technical, procedural and intellectual knowledge. ‘Creative thinking skills’, which are how flexibly and imaginatively people approach problems and ‘Motivation’, where intrinsic is more effective than extrinsic. By combining all of these three you will have creativity [23].

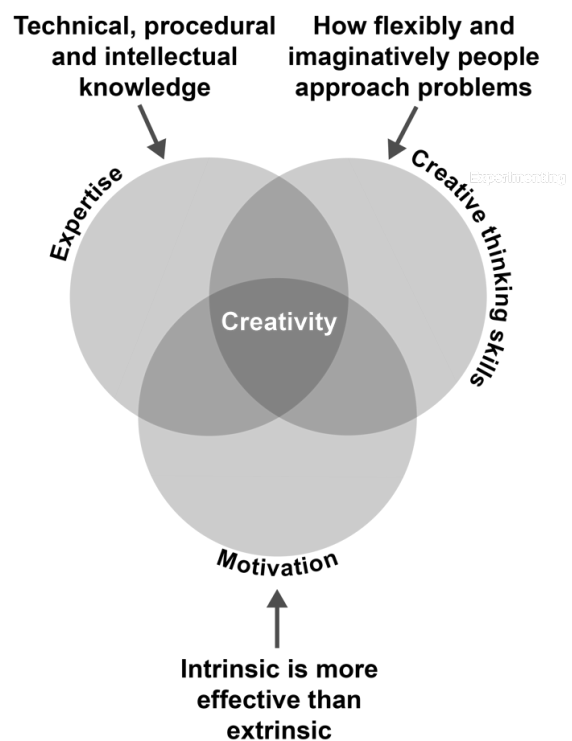


Figure 3: The three components of creativity according to Teresa Amabile [49]

Dan Pink states that ‘most inventions and breakthroughs come from reassembling existing ideas in new ways.’ [24]

Steve Jobs and Albert Einstein viewed creativity as combinatory play or connecting the dots [25]

Do note the similarity between this and Meinel’s ‘the re-design rule’ [12]

### 2.1.2 Constraints

Creativity loves constraints, Caneel K. Joyce suggests that while some amount of choice is important for encouraging creativity, too much can be counterproductive [26]

This is backed by practitioners [27]. And thought leaders like Teresa Amabile [28], David Hansson [29] and David Kelley [30] to name a few.

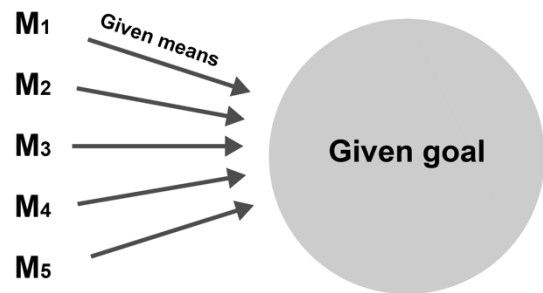
### 2.1.3 Causal vs. effectual reasoning

Saras D. Sarasvathy has done a lot of work with entrepreneurs and what makes them entrepreneurial. As an entrepreneur you have to be creative given the restricted resources like time, money and human. In order to succeed, one needs to be innovative in one way or another.

Saras’ studies points towards two different thought processes and approaches to solving problems.

One is called *causal reasoning* and the other one is called *effectual reasoning*. The latter is a common trait of entrepreneurs and in her words it’s about ‘believing in a yet-to-be-made future that can be shaped by human action and realizing that, to the extent that such action can control the future, one need not expend energy trying to predict it. It is much more useful to understand and work with the people who are engaged in the decisions and actions that bring it into existence.’ [31]

**Managerial thinking:  
Selecting between given means  
to achieve a pre-determined goal**



**Entrepreneurial thinking (effectual):  
Imagining a possible new end  
using a given set of means**

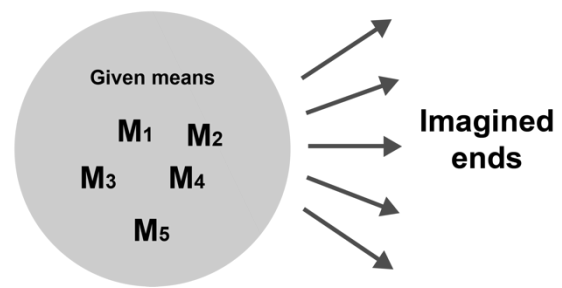


Figure 4: Causal vs. Effectual reasoning [50]

Effectual reasoning is all about using the available resources in the right way to create a path to the solution of a problem, as opposed to knowing the way to the solution before hand and trying to execute in order to get there.

In order to successfully do so, one need to have social and associating skills so one can mobilize people in the correct way, confidence to take the team towards the unknown and creativity to come up with different solution paths.

If we look at entrepreneurs as individuals operating in an environment naturally constrained [32] and that their success and value creation is dependent on their creativity, we can connect that definition to the roles of association and ambidextrous thinking [11][20] and see how effectual thinking may be beneficial for design thinking practitioners.

### 2.1.4 Hunches

Nobel peace prize winner in economics prof. Daniel Kahneman is a pioneer within the field of cognitive psychology and decision making. His work has revealed that there are two systems working in our brain. System 1 and system 2, also addressed as fast and slow thinking. Due to the amount of information our brain has to process throughout the course of a day, we most of the time operate within system 1 or fast thinking. This way of thinking works fast, subconsciously and intuitively. Once we meet a task that can not be solved through system 1, system 2 will kick in, which is analytical and good at solving more complex problems. This is however a more demanding process and our pupils dilate and we become more focused. [33]

More importantly for this study, is to realize that humans operate and are more comfortable within system 1. We are experts at taking shortcuts and making assumptions in order to make life easier. System 1 is a necessity in order to not overload the brain with tasks to be solved from day to day.

System 1 "Fast"	System 2 "Slow"
<b>Defining Characteristics</b>	
Unconscious Effortless Automatic	Deliberate and conscious Effortful Controlled mental process
No self awareness or control	With self awareness or control
Superficial Impulsive	Logical and skeptical Analytical
<b>Role:</b> Assess the situation Deliver updates	<b>Role:</b> Seek new or missing info Make decisions

Figure 5: System 1 and System 2 thinking [51]

Hunches or gut feeling is another topic related to fast thinking, and research shows that acting on hunches can be powerful when used in the correct way [34]. During a study by Gary Klein he interviewed a fire man who's hunch saved his and his squadrons' life from a collapsing house [35].

According to Eugene Sadler Smith intuition informs many ethical decisions; it aids creativity, it is about feelings and it does not speak to us in word, but in imagery or metaphor [36]. We see that this idea is compatible with the tangibility rule of design thinking [12].

Sadler-Smith builds on the work of Nobel prizewinner Herbert Simon, who studied decision making in chess and of chess players with over 10000 hours of practice behind them [37][38].

According to Sadler-Smith, intuition works when long experience is salted away and then instantly recalled by the non-conscious mind.

'There are no shortcuts' he says.

'You have to have had the explicit learning, the expertise, the experiences; your analytical mind compresses all that stuff and feeds it into long-term memory.' [34]

### 2.1.5 Flow

Hunches and fast thinking are sub-conscious processes in our minds. Mihaly Csikszentmihalyi has done a lot of research on what he calls the optimal experience, those times when people report feelings of concentration and deep enjoyment. It has revealed that a state of consciousness called flow [39] is what makes an experience genuinely satisfying. People typically feel strong, alert, in effortless control, unselfconscious and at the peak of their abilities. Both a sense of time and emotional problems seem to disappear and there is an exhilarating feeling of transcendence.

There are three conditions that must be met in order to achieve the state of flow. [39]

1. One must be involved in an activity with a clear set of goals and progress. This adds direction and structure to the task.
2. The task at hand must have clear and immediate feedback. This helps the person negotiate any changing demands and allows them to adjust their performance to maintain the flow state.
3. One must have a good balance between the *perceived* challenges of the task at hand and their own *perceived* skills. One must have confidence in one's ability to complete the task at hand.

In addition, there is also a phenomenon called group flow, that might appeal to design thinking. This happens when flow becomes inherently mutual within a group. Csikszentmihalyi suggests several measures in order to facilitate group flow [40]:

1. Creative spatial arrangements: Chairs, pin walls, charts, but no tables; thus work primarily standing and moving
2. Playground design: Charts for information inputs, flow graphs, project summary, craziness (here also craziness has a place), safe place (here all may say what is otherwise only thought), result wall, open topics
3. Parallel, organized working
4. Target group focus
5. Advancement of existing one (iterative prototyping)
6. Increase in efficiency through visualization
7. Using differences among participants as an opportunity, rather than an obstacle.

### 2.1.6 Creative confidence

Tom Kelley and David Kelley have written a book [41] where they describe creative confidence and how it is the key to unleashing the creative potential within us all.

As we saw earlier in this paper, previous research suggests that creativity is something that can be learned [22]. According to Tom and David the one thing that holds us back is the confidence within ourselves. We are from an early age conditioned to not be creative, but predictable and reliable. Hence most of us disregard the fact that we have creative potential [41].

We will not go too much in depth in the field of creative confidence as there has been done a lot of good research on it, also within the field of design thinking.

One thing to notice is that a study from 2010 suggests that the design thinking process is one of many possible pathways to creative confidence [6].

### 2.1.7 Mindset

Carol Dweck has studied mindset and what she calls 'the psychology of success'. There is a lot of valuable insight in her work and through it she has identified two different mindsets in people. A *growth* mindset and a *fixed* mindset, where the latter is the most common one. [44]

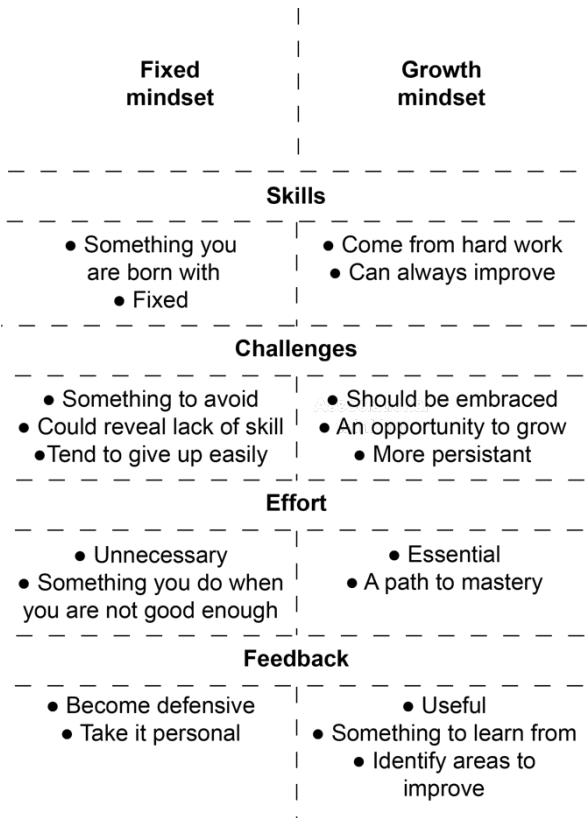


Figure 6: Fixed vs. Growth Mindset [52]

People with a fixed mindset tend to think that our personal skills and abilities is something that has been defined by our genetics and who we are as a person. This implies that people who have mastered a certain skill were destined to do it. They have become great at what they do because it was something they were meant to do.

On the other side, this also implies that it is hard or impossible to learn and master something you were not meant to be good at. With a fixed mindset, trying to become good at something that is initially hard or something that you believe you were not meant to do is discouraging.

Failing with a fixed mindset means that you have proven to the world that you are not one of the gifted ones. Hence gathering the confidence to genuinely try something new and unknown becomes much harder [44].

This is where we see the link to the idea of creative confidence, and given that design thinking facilitates people from a non-creative background to be creative we see that mindset plays a big role when it comes to practitioner satisfaction and potential gaps. Previous research has also shown that design thinking itself may lead to a change in mindset [4].

Having a growth mindset is the opposite of a fixed. With a growth mindset you believe that skills and abilities can be learned and achieved given enough time and motivation. Do recall Herbert Simon’s work and that the master chess players who experienced hunches and the state of flow when playing chess had over 10000 hours of practice behind them [37].

When having a growth mindset, taking on challenges become less intimidating. Failing, meaning not being able to do what you set out to do, just means that you have to work harder and grow. Gathering up confidence in yourself and the process becomes easier as the fear of failing disappears.

Dweck states that the two mindsets are not mutually exclusive and that most of us are in between growth and fixed, with a skew towards a fixed mindset. However, switching to a growth mindset is something that all of us can do and by knowing and being able to distinguish between the two, a lot of work towards a growth mindset has already been done [44].

### 2.1.8 Empathy

Empathy, the capacity to understand or place oneself in another’s position [46] is the key to Meinel’s ‘the human rule’ [12] and the user centeredness in design.

Developing empathy is something that happens at a very early stage of our life [47] and it is essential in order to interact well with other people.

Empathy is not a skill that is learned when practicing design thinking. Developing empathy



skills in design thinking means learning to shift the focus towards the user and implement methodologies that facilitates this focus [7]. Whether or not some people are more empathic than others and how that plays a role in practitioner satisfaction is beyond the scope of this paper.

We will instead focus on how personal experience affects the process of learning empathy in the design thinking context.

### **2.1.9 Communication**

The ability to communicate well is important for a team. In design thinking, to facilitate communicating ideas in a tangible manner is important, hence the tangibility rule [12]

Conceptual prototypes are central in design thinking, but they are also viewed as communication media [12]. This means that making concepts and ideas tangible makes them easier to understand, alter and process.

Having experience from design or a similar field might make the tangibility rule easier to adapt as it is a common practice within these fields. The concept of rapid prototyping, MVPs and the reason we make them should not be unfamiliar for a practitioner with the right kind of experience. The case might be different for someone who are not used to the way of working.

## **3. EXPERIENCE**

### **3.1 Defining experience**

We will define two types of experience based on how experience in combination with the gathered content may affect how the practitioner views the design thinking process.

#### **3.1.1 Process experience**

The first one is experience as a result of having practiced design thinking or a similar process earlier.

This type of experience can be found in for instance design professionals practicing design thinking in a new environment, like for instance innovating a business model. We will call this 'process experience'.

#### **3.1.2 Background experience**

The second type of experience is a result of things you have experienced as a person. For example, you may have never practiced design thinking or a similar design process, but you have acquired experience through your background and story.

To illustrate a practitioner with this type of experience we can imagine an accountant practicing design thinking for business model innovation within auditing.

We will call this 'background experience'.

Keep in mind that a practitioner with a lot of process experience does not necessarily have experience with design thinking as there are other methods that share the same characteristics and attributes.

For example, a professional designer who has practiced industrial design for years, but never applied design methods outside the field of design.

### **3.2 Difference between novice and experts**

The major difference between experts and novices is that experts have accumulated a large number of examples of problems and solutions in a specific domain of interest. [13]

The ability to mentally stand back from the specifics of the accumulated examples and form more abstract conceptualizations related to their domain of expertise is a key competency of an expert. [14].

They are believed to be able to store and access information in larger cognitive chunks compared to novices, and they can recognize underlying principles rather than focusing on the surface features of problems [15][16][17].

The accumulation of experience is therefore critical in the transformation from a novice to an expert [13].

### 3.3 Experience as a confidence booster

In 2002 P.J. Morgan and D. Cleave-Hogg conducted a research on the correlation between experience and confidence in medical students. After providing 144 medical students with a questionnaire and a following test they found that there is a good correlation between clinical experience and level of confidence. There were however no indications on correlation between experience, confidence and performance [45].

We now see how this previous research and knowledge can link back to the role of experience and practitioner satisfaction in the design thinking process.

## 4. METHOD

The interviews were conducted with the content analysis as basis. They were semi-structured with open form questions and aimed towards a more conversational flow.

The reason for this is the effect the content gathered plays on how the practitioner feels about the process. The content is believed to be complex and partly sub conscious. This assumption is based on the content analysis. By easing up on the rigidity and formalness of the interview we aimed to lower barriers and open up for digging deeper into the interviewees mind. Research suggests that interviews can reveal negative aspects better than for instance surveys [48].

The sample of interviewees was divided into four categories depending on the interviewee's experience. These categories were created for this paper and were mainly based on the content analysis (please see chapter 3 for more information).

	<b>No process experience</b>	<b>Process experience</b>
<b>No background experience</b>	<i>Category 1</i>	<i>Category 2</i>
<b>Background experience</b>	<i>Category 3</i>	<i>Category 4</i>

Figure 7 (Original): Illustrates the four different interviewee categories

### 4.1 Interview structure

The semi-structure of the interview was based on the four principles of design thinking. In addition, the gathered material, which is more personal and practitioner related, was used as topics to touch upon if it became natural to the flow of the conversation. A list of the four principles and the subjects were brought by the interviewer, but not shown to the interviewee.

The audio from the interview was recorded and notes were taken along the way. The interview was directed by the interviewer asking questions that came natural to the flow of the conversation, whilst keeping the list of bullet points in mind.

Bullet points brought to the interview:

- **The human rule**
- **The ambiguity rule**
- **The re-design rule**
- **The tangibility rule**
- Personal traits and others:
  - Constraints
  - Causal vs. Effectual reasoning
  - Hunches
  - Flow
  - Creative confidence
  - Mindset
  - Empathy
  - Communication
  - Process
  - End result

#### 4.2 Sample size

The final sample reached was a total of 15 practitioners distributed throughout the different categories. Category 3 was the most represented with 6 practitioners fitting this category.

The interviews were conducted face-to-face, but if that was not possible, video conference, followed by telephone were the alternatives. The length was approximately 35-40 minutes for each practitioner.

The results from the interviews were then gathered and analyzed in order to see if we could uncover if and why gaps occurred, for whom and where in the process.

#### 4. RESULTS

After about half way into the interviews, patterns started to emerge. It became clearer that the four categories that were used were not as significant as one would have thought. The main divide occurred between no process experience and process experience. The difference in background experience seemed to play a lesser role in how the practitioners felt regarding design thinking.

It is interesting to note that all of the practitioners who had completed the process, in hindsight, saw the value of the steps and tools. Usually towards the end of the entire process, when convergence towards the end result was in progress. This stage is illustrated as the later half of stage 4 in figure 7.

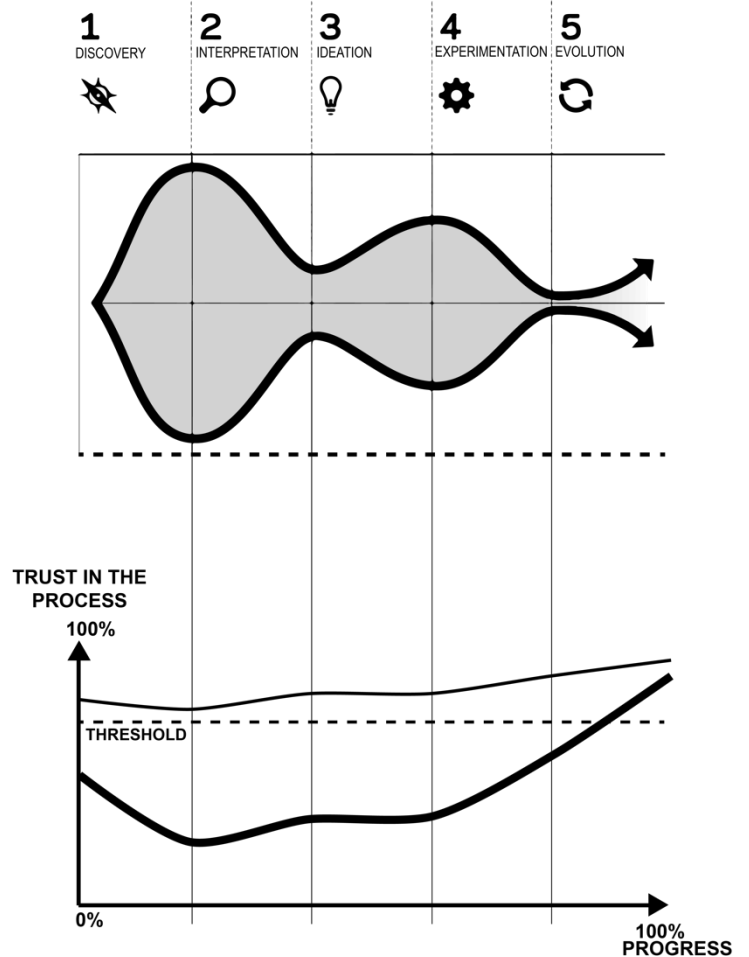


Figure 7 (Part original): Illustrates how trust typically develops throughout the process, for legend, please see figure 1. [53]

The gaps that were discovered only occurred during the practitioner's first encounter with design thinking. In other words, during the transition from no process experience to process experience.

Practitioners with previous process experience were no longer concerned or questioning towards the tools and steps. The tendency was that they during their second or more round of using the process had made preferences and opinions on how to use what and when. Essentially navigating the process more freely, compared to the first time.

Many saw a lot of value experiencing the process again as they saw it from another angle. It was described as seeing the picture clearer, even

though you already have an idea of what the picture looks like. When it comes to the gaps that occurred for the first time practitioners there are a couple of insights.

Unrelated to the mindset the practitioners had when they approached design thinking (some were open-minded and some were more skeptic etc.), most of them seemed to feel more or less distanced from the process at one point or another along the way.

Findings from the interviews suggested that a lot of the first time practitioners felt somewhat distanced by the initial fear of something foreign. This was both equally true for category 1 and category 3 practitioners.

The design thinking process can be very different from what the practitioners were used to, this also depended on their background. For instance, finance tended to focus on the outcome and the measurable end result, while engineering focused on solving specific defined problems.

Collectively it seemed that most questions occurred during the diverging parts of the process. On the other hand, the opposite happened during the converging parts. This was explained by many as “feeling more familiar with the process”, considering that the converging leads the design thinking process towards a more linear and, depending on background, conventional way of working.

When it comes to the ambiguity, it led to some distancing due to the uncertainty of the outcome. Some even felt anxious. The practitioners who felt less distanced by the ambiguity, were the ones who had made the connection between the ambiguity of the process and how things are in the real world.

A very interesting finding was how large of a role the team played when it came to dealing with the ambiguity and creating a creative atmosphere. Practitioners often mentioned that they found confidence from their team and that

the ambiguity and the choices made, were not as concerning when you had a whole team behind them.

There were however mixed feelings regarding the interdisciplinary teams. This generally boiled down to ease of communication and common understanding of different topics. This means that some people experienced friction when trying to present their opinions and views to others from a different background. One practitioner spoke about the curse of knowledge and how certain things that seemed obvious to themselves, was not at all obvious to the other and required thorough explanation.

However, there was a common understanding from all the practitioners on how an interdisciplinary team creates value, especially in a process like this. One thing is the diversity of ideas, but another, more interesting factor was the collective mindset and willingness to explore and have fun.

A pattern that emerged during the interviews was the importance of having a creative atmosphere. As mentioned, the team plays a big role in this, but some people in addition mentioned the classroom setting, the hands on approach (the tangibility rule) and the overall fun and unconventional approach of design thinking. This also relates very well to the state of group flow discussed in chapter 2.1.5

One must also mention that some of the practitioners experienced setbacks related to the team. Typically, one or two members of the group would be more skeptical and less engaged in the creative activities. This highlighted the importance of having a strong and collective mindset, as the practitioners who experienced this reported a major decrease in their own willingness to be creative and playful. Here it might be relevant to look back at Carol Dweck’s two different mindsets discussed in chapter 2.1.7 and consider the possibility of a team member’s mindsets affecting the others on the team.

Especially if they are not aware of the different mindsets to begin with.

Moving away from the team and focusing on the process, it turned out that some of the practitioners, especially from an engineering background initially felt distance from the process when it came to the empathizing part. This were especially true when it came to involving the customer. It was not that they did not see the importance of doing so, but rather the fact that they felt confident that they could figure out all the insights within the team. Interestingly, this opinion did not change even after receiving insights from the different empathy steps and tools. This was early on in the process and it was not until towards the end of the project and seeing the end result that those who were somewhat skeptic acknowledged the value of involving the customer.

The concern was not only due to the mentioned confidence towards the knowledge within the team, but some practitioners expressed concerns regarding the scope of the different observation tools. The POV exercise was explicitly mentioned several times, and some practitioners from business and engineering backgrounds were concerned of the scalability and scope of the tool. They feared it might be too specific.

It was also mentioned by the same type of practitioners that the lack of metrics and measurability of the results felt uncomfortable at first, but as soon as they accepted it, it did not create more distance.

Lastly there was a lot of talk about the time scope of the projects. Most of the practitioners interviewed had experienced design thinking for the first time in an academic course context. The concern here was that they at times felt that there was not enough time to act out the different steps and tools. Combine this with the ambiguous nature of the process and it could create discomfort, especially when it came to setting deadlines. Some felt that the

implementation stage towards the end was forced and rushed.

Practitioners who practiced design thinking in an academic course context also stated that they feel they would have connected better with the process if the intensity was higher, so instead of doing design thinking two times a week for ten weeks, they would prefer 5 times a week for two to three weeks, allowing them to keep the momentum going and build on the created energy and atmosphere.

## 5. DISCUSSION

The first part of the discussion will be regarding potential measures one can take in order to narrow the gaps that occurred for some along the way. These measures were found partly during the interview and partly by analyzing and connecting the gathered content with the results from the interviews.

The first measure is in regards to the members of the team who fell off the wagon and dampened the creative drive of the entire group. Several practitioners highlighted the importance of taking part ownership of the project meaning that they felt better and more connected with the process when they realized that they had a significant role in the progress made.

The ambiguity of the process led to some practitioners doubting the potential outcome. Based on the interviews it became clear that showing examples of real world businesses using design thinking and how it was before and after would motivate them significantly. This can also satisfy the practitioners who were seeking more measurable results and numbers.

One practitioner mentioned that she did gain an increased appreciation towards design thinking after using it as a last resort, having failed by using what was considered the conventional approach within her field.

Another important point is related to the team dynamics, some practitioners felt they gained confidence when they had at least one practitioner with process experience who could serve as a guide throughout the different steps. It is important to mention that the intended function of the guiding practitioner would not be to come up with better results. It would be to serve as a source of confirmation that the team was working the way they were supposed to according to design thinking.

Highlighting the process could also be a powerful measure. Insight from the interview showed that some practitioners found confidence in the process by looking back at the iterative steps they had taken. They would fight the ambiguity by looking back at the progress that had already been made. This way of thinking could lead all the way back to the initial observations and insights, thus connecting the process to the real world.

Another important point besides focusing on the process is to create a suitable atmosphere. In addition to the team, the classroom, teaching style and tangibility of the process to name a few, had an effect on how the practitioner felt towards creative exercises like for instance brainstorming. By creating a space where you were meant to play and explore it would take away the pressure from having to come up with measurable outcomes and results.

Acknowledging the process itself and setting aside concerns regarding the end result and impact of the project also helped many first time practitioners. They would remind themselves that the process itself was a goal and that there was a reason behind them doing it, even though they did not know the reasons more specifically.

Seeing the end result and looking back in hindsight, seemed to be where most of the practitioners became most convinced. With that said, they stressed the importance of having gone through the process and questioning as an ingredient to the realization towards the end.

This connects well with the ideas of there being no shortcut to experience, discussed in chapter 2.1.4 and also the research done on what makes an expert, chapter 3.2

Some highlighted the importance of being prepared to have fun and accept that it is going to be different, while some just decided to go along with the process regardless of their doubts. The ones who did the latter, in the end turned out to become more convinced than they initially expected.

The second part of the discussion is dedicated to discussing the paper and method.

The first factor we need to look closer at is the potential sources of error. Firstly, we need to consider the possibility of biases occurring during the interview process. To begin with it, I was the only person conducting the interviews. This essentially means a risk of confirmation bias as I was also the one who collected the content prior to the interviews.

The structure of the interviews was semi open, conversational and casual. The reason for this was the nature of the topics covered, as mentioned more in depth under the method section of this paper, chapter 4.

There is however a source of bias by having this structure with no strict and uniform questions setup. After having done several interviews and patterns are starting to emerge it might happen that the interviewer unconsciously starts searching for similar patterns when interviewing new subjects, creating a confirmation bias. The questions themselves could also be of a suggestive nature; however this was attempted minimized with pilot interviews.

It is important to consider that there are more factors affecting how practitioners experience design thinking than just the practitioners' view on the process.

How you experience design thinking may also vary substantially depending on factors like context and environment, team members, teachers and tutors, project and so on. The insights gathered from the interviews came from different sources that had experienced different variations of design thinking, meaning that we cannot overlook the possibility of it affecting the results.

There are also a large variety of ways to practice design thinking. This depends strongly on the people who are teaching it and how they want the students to learn it.

A large part of the sample interviewed was international students. This is an important factor to consider. The topic this paper covers may be affected by the fact that some of the practitioners, practiced design thinking in a place where cultural differences and a language barrier might be present. These things could affect how they felt about certain parts of the process, like for instance interviews.

## 6. CONCLUSION

To conclude this study, our major findings were that the prior experience was mostly relevant when it distinguished between people who had experience from the design thinking or similar processes and people who did not. Distinguishing whether people had relevant background experience within the domain of the project was of less relevance to whether practitioners doubted and distanced themselves more from the process.

The team and its composition plays a central role when it comes to the motivation of the practitioners. The team can create a creative atmosphere and serve as a space where one can exchange ideas and build on each other's input. It can also work the other way around and findings suggest that if even only one team member is not sharing the same enthusiasm and

flow as the rest of the team, it can be enough to create gaps for all the team members.

One of the main sources of occurring gaps turned out to be the ambiguous nature of design thinking. This varied depending on the practitioners professional or academic background and it was especially during the first and second diverging parts of the process that.

For some backgrounds like finance and engineering, the lack of measurable outcome could create gaps. For some of the tools within design thinking, especially POV (Point-of-view) and creating a persona, practitioners expressed an initial concern of it being too narrow and not scalable enough. One possible solution to this gap is to shift the focus from the outcome and to the process. Looking at the process itself and the iterative steps could also serve as action to connect and synchronize the practitioner with the process and fight the negative effects of ambiguity.

Furthermore, providing examples that can link the process to the real world were for most practitioners a very effective source of confidence and motivation.

The time span of the project affected how some practitioners experienced the process, some felt that certain steps were forced and rushed. This led to the process not feeling organic or natural, in turn causing a gap.

All of the practitioners interviewed saw the value of design thinking in the end. There were differences as to which parts and tools were more valuable and in which scenarios, but all in all, none of the practitioners failed to see any value at all. For most of the practitioners, the realization of the value from the process occurred towards the end, when the process started to converge towards the end result.

It is important to highlight the fact that there are several factors affecting the practitioner in a design thinking process and that not all of them

were intended to be covered in this study. We have not taken into account the variety of ways you can set up and also teach the process. The different circumstances and team compositions are a few of them.

For further work on this topic, it would be interesting to explore the team and the role it plays in a design thinking context more closely. It could also be of value to further explore the problems presented in this study, as there are sources of error that can potentially be removed for a more accurate result.

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