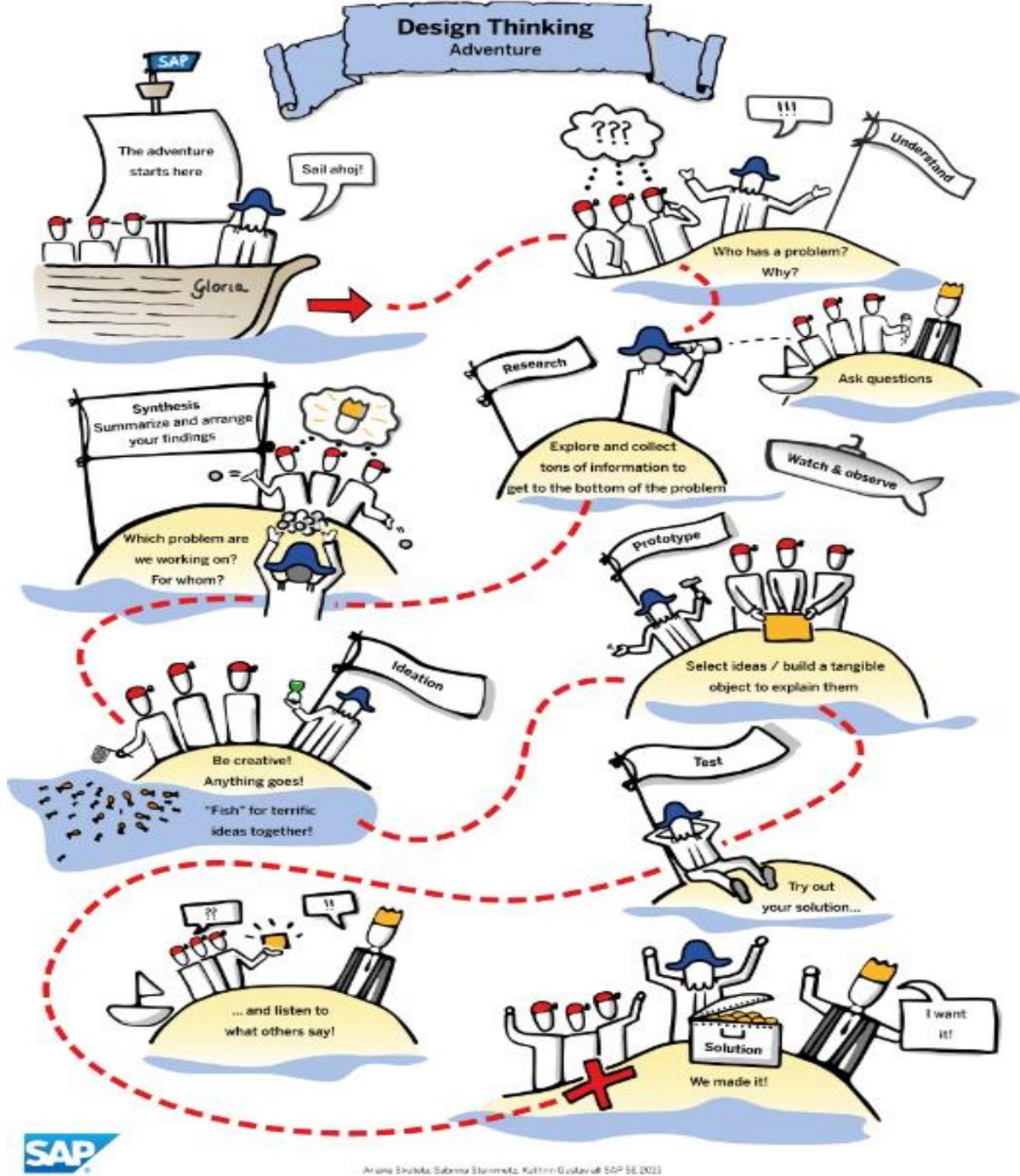


SAP Young Thinkers

Design Thinking Kit for Educational Organizations





¹ This Picture can be used as a poster in the classroom and is available in German, English, French and Spanish

Preamble

This Design Thinking Kit offers you new ways to be empathic and collaborative when you are designing new solutions for your classroom, school, and community. It hones your skills and empowers you to create desirable solutions. In this Design Thinking Kit, SAP has laid out a series of steps that can help you develop new, innovative solutions designed with people at the center.

This Design Thinking Kit equips you with the process and methods of design so you can be more conscious about facing and solving for your own, current challenges. Businesses, social entrepreneurs and other innovators have used these methods for decades to create solutions for many different types of challenges.

As educators, you are already designing every single day— whether it's finding new ways to teach content more effectively, using your classroom space differently, developing new approaches to connecting with parents, or creating new solutions for your school.

We know that your time is precious and demands are high, and it may often feel that the system in which you educate is not as nimble as necessary to keep up with the rapidly evolving demands. However, you already possess the skills to solve for these kinds of challenges.²

The methods in this Design Thinking Kit are adapted specifically for you – to experience Design Thinking (DT) with your students and to coach them in a way that they will be able to solve complex problems.

This is an invitation to experiment with design processes. Let it inspire you to approach challenges differently and experience how Design Thinking adds a new perspective to your work with young people.

² ED Toolkit Ideao, Attribution-noncommercial-Share Alike 3.0 Unported license (CC By-nc-SA 3.0).

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About this Document

(What is it and how teachers can use it)

You can use this Design Thinking Kit to set up Design Thinking Workshops and to learn what is required to do this.

For ease of use you can jump from the content page directly to each chapter.

Links are provided in the chapters, the link leads you to the other chapter (forward) and also back to the place you started (backwards).

Whenever possible you'll find additional tips and examples (**violet colored letters**) for each phase. Chapter 7 (which describes all the Design Thinking phases) has a consistent structure. Templates are also available for certain methods in the DT Kit (zip file).

The Appendix offers you additional information and descriptions of Energizer games, as well as a list of book recommendations.

The Design Thinking Kit is enhanced by Agenda Examples, Design Thinking slide decks and templates for your use. The poster mentioned in the preamble is also a part of the package we offer you.

We offer you also all download material mentioned in this guide – all provided in the zip file (for usage without having internet access).

We hope that this material will help you to have successful and enjoyable DesignThinking workshops.

This Design Thinking Kit is divided in the following chapters:

Chapter 1 - Design Thinking (DT) - An Overview:

In this chapter you will find an overview about Design Thinking and where it is used.

Chapter 2 - What you need to know about taking on the Role of a Coach:

There is a difference between being a teacher and being a coach – in this chapter you will learn about what the role of a DT coach is.

Chapter 3 - What You Need to Know About Collaboration:

Collaboration is an essential part of Design Thinking and in this chapter you will find all the information you need to know about it.

Chapter 4 - What you can do to prepare the Classroom Setup:

This chapter provides you with information on how to prepare the classroom and what you need for a DT Workshop in a classroom.

Chapter 5 - What you need to Know about the In-Class Design Thinking Lesson and Project Delivery:

This chapter provides examples for the in-class delivery (suggestions for DT workshops and a checklist).



Chapter 6 - Understanding Design Thinking:

To understand DT a lot of things are important – in this chapter we explain the DT Process as well as what is needed to understand DT.

Chapter 7 - The Design Thinking Process (6 phases):

In this chapter the whole DT process (6 phases) is introduced and we suggest methods and energizers for each DT process step.

The structure of the chapter is ordered in the following structure:

- Explanation of the process phase
- Recommendation of energizer games for each phase
- List of phase activities
- Checklist of the outcome of the phase
- Explanation of different methods to use for each phase (**you need not to read all method descriptions at the beginning - only the essential ones**)
- Tips for the coach

Appendix:

- Supplementary information for each chapter
- More Methods (Chapter 7)
- Energizer Game description (Chapter 7)
- Book recommendations

1. Design Thinking - An Overview

1.1 Where does Design Thinking come from³?

The notion of design as a "way of thinking" in the sciences can be traced to Herbert A. Simon's 1969 book *The Sciences of the Artificial*, and in design engineering to Robert McKim's 1973 book *Experiences in Visual Thinking*. Peter Rowe's 1987 book *Design Thinking*, which described methods and approaches used by architects and urban planners, was a significant early usage of the term in the design research literature. Rolf Faste expanded on McKim's work at Stanford University in the 1980s and 1990s, teaching "design thinking as a method of creative action." Design thinking was adapted for business purposes by Faste's Stanford colleague David M. Kelley, who founded IDEO in 1991. Richard Buchanan's 1992 article "Wicked Problems in Design Thinking" expressed a broader view of design thinking as addressing intractable human concerns through design.

1.2 What is Design Thinking?

Design Thinking is a people centered way of solving difficult problems. It follows a collaborative, team based, cross disciplinary process. It uses a toolkit of methods and can be applied by anyone – from the most seasoned corporate designers and executes to school children.⁴ Watch short videos (you can also use them in workshops):

DTprocess: <https://www.youtube.com/watch?v=a7sEoEvT8l8>

DT@SAP: <https://www.youtube.com/watch?v=vvu5mgocfjg>

DTprocess with kids: <https://www.youtube.com/watch?v=Ee4CKIPkIik>

1.3 Design Thinking in Practice

Meanwhile Design Thinking is used not only at Universities – but also in companies. At SAP SE we use Design Thinking as an approach in our development units – to understand our end users better and to collaborate with our customers, so that we can deliver solutions which fit for end users. Our experience is that we deliver better solutions – the customers want. Solutions based on DT process are much more successful compared to solutions for which we did not collect customer and enduser feedback before we developed them.

³ Wikipedia article about Design Thinking: https://en.wikipedia.org/wiki/Design_thinking#cite_note-ReferenceB-48

⁴ Design Thinking Pocket Guide, Robert Curedale p. 9 ISBN: 978098246859

The University Alliances unit provides different programs for universities and schools - like the „Young Thinkers” program. In this program we support schools to establish Design Thinking in schools and other educational organizations.

To ensure that a Design Thinking Workshop will be successful, you need Design Thinking Coach (es), interdisciplinary teams and room for creativity (a room in which you can work but also time and opportunity to work creatively). In the following chapters you'll find detailed information for whom Design Thinking is applicable (due to the fact that Design Thinking will not fit for every person and situation) as well as what you will need to prepare and execute a Design Thinking Workshop.

1.4 Design Thinking in Education⁵

Design Thinking in education typically takes three forms: helping school administrators solve institution-based problems, aiding educators develop more creative lesson plans, and engendering Design Thinking skills in students.

In addition to enriching a curriculum and expanding student perspectives, Design Thinking can also benefit educators. Researchers have proposed that Design Thinking can enable educators to integrate technology into the classroom.

Design Thinking as a viable curricular and systemic reform program is increasingly being recognized by educators.

"Much of today's education system guides students towards finding the correct answers to fill-in-the blanks on standardized tests, as this kind of instruction facilitates streamlined assessments to measure success or failure... "

It is critical that, particularly in under-served schools this model of learning does not continue to prevail. Students need both the skills and the tools to participate in a society where problems are increasingly complex and nuanced understandings are vital.

1.5 Preconditions for a Design Thinking Workshop

Enable Design Thinking by experiencing it First Hand.

SAP encourages you to participate in a Design Thinking Workshop, before you organize Design Thinking workshops in your school. SAP offers many types of workshops, both physical and virtual sessions, some as short as 1 hour in length. University Alliances encourages you to participate in one, ideally in a physical workshop (length 3 - 5 days).

⁵ Wikipedia article about Design Thinking https://en.wikipedia.org/wiki/Design_thinking#The_languages_of_design

1.6 Benefits of Design Thinking⁶

- Pragmatic approach to tackle „mystery“ areas.
- Flexible and adaptable to all kind of challenges.
- Puts people’s needs and wishes in the foreground and avoids expensive redesigns in later implementation phases (“fail early”).
- Systematic innovation approach with a structured process, which helps to leverage creativity potential.
- Overcomes limitations caused by hierarchy and too much formality.
- Does not need much more than a [room](#) a team and sticky notes...

⁶ DT presentation provided by Thomas Eckert, SAP SE 2015

2. Role of a Coach

2.1 For whom is Design Thinking applicable?

Design Thinking is best suited for teachers who are able to change their teaching style:

From	To
Frontal lesson delivery	Team facilitation
Controlled instruction	Team work
Being an educator	Being a coach
Being serious	Being creative and motivating

“Moderate as much as possible however lead as little as necessary.”

And reflect the following:

People are taught at school that each of them should be better than others, their classmates. Design Thinking emphasizes that the opinion of each individual counts.

The competition thinking continues during professional education. Such thinking is usually important for professionals to make the next step in their own career – but teamwork is also required because at the end a single person is only successful if the team behind him/her is it also. In Design Thinking the team counts more than the individual, so team cooperation should be encouraged.

A Design Thinking coach doesn't need to know the details about the challenge – his main task is to decide which methods to use, to create an agenda ⁷and ensure that the team(s) follow the Design Thinking process. In the next sections we explain the specific characteristics and tasks of a coach.

2.2 Characteristics of a successful Design Thinking Coach⁸

In the Design Thinking process a lot of different creative methods are used. Each coach should be familiar with the different methods – but knowing the methods is not enough. To be a successful coach you need to have the following characteristics:

⁷ You'll find example agendas in the zip file 'DT Educator Kit'

⁸ Read also comments about Characteristics in: Design Thinking pocket guide / Robert Curedale / p 53 -> source: Gerd Waloszek, SAP SE, SAP User Experience 2013

Characteristic	Description
Empathetic⁹	See the world from a different perspective and yield insights that can then be used to inspire innovation
Attentive¹⁰	The ability to hear and understand what is being said is the most important communication skill of all.
Experimental¹¹	A willingness to explore constraints in creative ways, helps move the conversation in entirely new directions.
Collaborative¹²	The best solutions come from the interactions of multiple disciplines and groups.
Curious¹³	The curious mind is constantly learning new things, making new connections to what is already known, and devising new solutions to persistent problems.
Experienced¹⁴	Previous success working with real people to solve real problems speaks volumes about future success.
Facilitative¹⁵	A good facilitator motivates the team, stimulates discussion, and channels group energy to achieve the desired outcome.
Optimistic¹⁶	Confidence is contagious and helps build the kind of group chemistry required to get things done.

⁹ Design Thinking pocket guide / Robert Curedale / p 53

¹⁰ Design Thinking pocket guide / Robert Curedale / p 53

¹¹ Design Thinking pocket guide / Robert Curedale / p 53

¹² Design Thinking pocket guide / Robert Curedale / p 53

¹³ Design Thinking pocket guide / Robert Curedale / p 53

¹⁴ Design Thinking pocket guide / Robert Curedale / p 53

¹⁵ Design Thinking pocket guide / Robert Curedale / p 53

¹⁶ Design Thinking pocket guide / Robert Curedale / p 53



As mentioned earlier it's easier to crush ideas than to create them. Each coach should be careful to use the right terms.

Five Thumb rule for coaches:¹⁷



Don't forget the little things: Sometimes the smallest details can trip us up. Watch for the little things, and the rest will take care of itself. (pinky finger)

Commitment: to the team, to the situation, to the game. (ring finger)

It's all about respect: Everyone deserves respect. Everyone! (the middle finger)

Don't point the finger at someone: Be responsible for yourself. It is human nature to make mistakes now and then but we are terrible at covering them up. When you make a mistake, own up to it, and do your best to make it right. (the first finger)

Be positive: There is enough negativity in the world. You only have to watch TV or read a newspaper to find it. Let's focus on the good things happening around us.

Choosing the correct phrases as a coach:

Tip: Avoid sentences like this:

¹⁷ Adapted from: The big book of low-cost training games, Mary Scannell & Jim Cain printed in the United States of America 2012, McGraw Hill, ISBN: 978-0-007-177437-6

„sounds good, but..“ / „...will be too expensive“ / „...is not realistic“ / „...will not function“ / „...makes no sense“ / ...

Remember that in the beginning an idea is not perfect. Your students are just beginning to incept an idea. Allow the student teams to see how the process will support the right decision in the end. This is how you teach students creative confidence.

2.3 The Languages of Design Thinking¹⁸

Conventionally, Design Thinkers communicate mostly in **visual or object languages**. Most designers might use drawings, scale models, or prototypes as their primary means of design, in practice an unlimited range of visual and verbal design tools is being used for design thinking. Symbols, signs, and metaphors are used through the medium of sketching, diagrams and technical drawings to translate abstract requirements into concrete objects¹⁹. In other words encourage team members to sketch their ideas rather than use lots of words.

2.4 Tasks of a Design Thinking Coach

During a Design Thinking workshop the team counts! Ideally, we recommend interdisciplinary teams, to ensure a 360 degree view and interconnected thinking. We suggest: Mix pupils from different grades and maybe invite some external participants.

The teacher acting as Design Thinking Coach needs to facilitate the team – the teacher must take a background and supporting role. She/he **only** facilitates **if the team** cannot:

- Make progress or
- have questions related to the methods or
- are frustrated
- request advise; but try to maintain a neutral opinion

It the team is brainstorming and collaborating successfully, do not interrupt or interject no matter how tempted you may be to assist. What you can do is:

Build the team:

¹⁸ Wikipedia article about Design Thinking: https://en.wikipedia.org/wiki/Design_thinking#The_languages_of_design

¹⁹ Book recommendation for books to learn visualization: Bikablo: Visual dictionary ISBN-13: 978-3940315212 or www.bikablo.com, Das brauchst Du! 232 Materialkarten zur Visualisierung ISBN-13: 978-3834612939; Lebendige Strichmännchen zeichnen ISBN-13: 978-3939817642

- Establish a good team spirit²⁰
- Talk directly to participants and ensure each member feels comfortable participating – even the introverts!
- Ensure that each participant is able to finish their thoughts and one person speaks at a time. Teammates should not cut each other off or interrupt.
- Moderate those participants that speak too long (e.g. longer than 2 minutes)
- Motivate the team(s) who have difficulties defining team rules
- Ensure that the team rules are observed by its members.

Support the challenge:

- Introduce the challenge and explain what is needed so that the team can complete the challenge successfully
- Support each Design Thinking step and ask teams if they need more information
- Lead with questions, not with answers
- Listen and try to understand
- Be the time keeper for the team or handover this task to a team member
- Ensure that team coaches document the process (e.g. by taking photos), the created results after each Design Thinking phase
- Ensure teams evaluate the results of their project. Have them use I like (things that worked) and I wish (things to be improved) statements.

Develop your Design Thinking Skills Continuously:

- Learn step-by-step different methods for each Design Thinking process step
- Learn step-by-step coach methods
- By the time you have learned different methods, stay up-to-date don't, stop learning
- Participate in and provide Design Thinking Workshops continuously to get deeper experience
- Collect feedback for your coaching skills to improve them from other DT coaches
- Exchange your experiences with other DT coaches
- And organize several DT workshops

²⁰ Refer to the team rules in the Appendix

2.5 Preparing a Design Thinking Workshop

Great workshops can make a difference in the Design Thinking process and lead to better results:

- Planning the workshop and creating a detailed agenda will help you as a coach to support the team to focus on the topic
- Think about the environment, the flow of the Design Thinking process
- Plan availability of interviewees and time for iteration meetings.

The following questions will help you create an optimal setting.

Who makes up a team²¹?

Invite people with different backgrounds especially when you know there will be a substantial effect on the understanding of the challenge. It is important that the people are available the whole time and that they are open to work in a team in a collaborative process where all people are on the same level. More information is available in the next chapter talking about interdisciplinary teams.

What should the format be²²?

As a rule of thumb, more viewpoints are generally better than fewer at the early stages. With five to eight participants or more, you can explore several alternatives in parallel by working in groups of four or five. Smaller teams need to explore alternatives – which can be used for different prototypes. Use peer presentation to bring all participants to the same knowledge and to facilitate them to build on the ideas of others.

How can space be used as an instrument²³?

If possible step out of the classroom and offer another room with team areas for the Design Thinking workshop. A different environment with more, open space and walls which can be used for drawings and sticky notes, bar tables or moveable furniture will change the mood of the participants. You will find more information in section 5 (Facilities)

What tools and material are needed²⁴?

Prepare a self-service area with brown papers, pencils, crafting stuff, post it's, markers, and other tools so participants can help themselves with what they need.

²¹ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 166 - 167

²² Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 166 - 167

²³ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 166 - 167

²⁴ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 166 - 167

More information is available in [chapter 3](#) of this document (Material needed for a Design Thinking Workshop).

What else is needed²⁵?

Equip your team with a common Design Thinking language to overcome “Blah, blah, blah”. Conduct more creative conversations by running ice-breaking exercises. This will lead to more enjoyable and energetic workshops that produce actionable outcomes that can truly solve complex problems (maybe beyond a pure focus on technology and features like app development).

Before the workshop²⁶:

You will help your team best if you plan and organize the workshop accurately:

Step	Activity
1	Create a workshop agenda with a clear thread that shows participants how the new or improved solutions with its value proposition(s) will emerge (agenda templates are available in section 4.1)
2	Ensure that all material is available
3	Reserve a room (if necessary) or make a plan how to change the classroom into a DT room (information how to change the classroom is available in section 3.1)
4	Organize DT coaches (you need one coach for a team of 6 people)
5	Send out the invitation 10 days before
6	Assure that for the planned interviews time, enough people of the target group are available. Create also a time schedule for the interviews (think about where your students can meet target group participants for first interviews as well as later on for interactions)
7	Create an interview schedule

During the workshop²⁷:

Step	Activity
1	Take participants on a journey of many steps by focusing on one simple task at a time.

²⁵ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 166 - 167

²⁶ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 168

²⁷ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 168



2	Avoid to shoot the bull and favor structured interactions with tools like the Empathy map , Experience maps , Business Model Canvas ,... (in each of the following sections you'll find creative methods you can use).
3	Alternate between working in small groups (5-10) people and plenary sessions for presentations and integration.
4	Strictly manage time for each phase, in particular for prototyping. Use a timer visible to all participants (in the next section you'll find information about this). It could be helpful to have one time keeper for all coaches.
5	Avoid slow activities after lunch – use energizers game (you will find energizers in the appendix) to 'wake up the people'.

After the workshop:²⁸

Step	Activity
1	Plan five – ten minutes to clean the room
2	Collect the feedback of the participants (I like: what was good? I wish: What can be improved?)
3	Provide all workshop material and documented results to workshop participants and stakeholders you might have (target group participants).
4	Get going with testing your solution in the real world. Encourage the team to realize the solution ²⁹ .

²⁸ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 166

²⁹ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 169



2.6 What you need to know about collaboration

To find solutions for (complex) issues or problems it's helpful to work with experts from different disciplines.

For example: If a group of athletes work on a problem, all of them use the same perspective and the solution will probably be very unilateral.

As mentioned before – for innovative and creative solutions a 360 degree view is needed. Working with an interdisciplinary team – people with different background, competencies and experiences, will ensure this.

For example: A designer, an **economist, a lawyer, a developer and a book keeper will jointly create a comprehensive** understanding of the problem than a team of a pure athletic team. In an interdisciplinary team ideas will be created which are surprising, multi-faceted and in a best case innovative.

People³⁰:

Without people, there is no team. An ideal team consists of 5 – 8 people who will work together during the whole Design Thinking process supported by 1 coach.

Interdisciplinary Team(s):

It's useful to work together in a team with people from different backgrounds (culture, age, gender, country,...) and with diverse competencies and experiences (education background, hobbies, family, travel, social activities,...) to create innovative ideas.

Each of them will have a different view on the problem or challenge and will suggest ideas based on his/her background. And all the others can build on this ideas and will then come to another solution, nobody has thought about before. To visualize the different backgrounds you can work with the **T-shaped approach**³¹ (especially in the Understand phase):

T-shaped people

- Everyone has some **broad knowledge** (crossbar of the “T”) based on liberal education and experiences
- Everyone has some **deep knowledge** (vertical part of the “T”) based on your education – schooling and qualification or based on deep experiences.

Challenge: ³²

- At school people are often I-shaped (have deep knowledge in one discipline)

³⁰ Andre Stern, DT Senior Coach SAP SE / Presentation for internal DT trainings 2013

³¹ <http://chiefexecutive.net/ideo-ceo-tim-brown-t-shaped-stars-the-backbone-of-ideo%E2%84%A2s-collaborative-culture/>

³² Design Thinking Pocket Guide / Robert Curedale/ p 63

- If someone is a really popular member, others might follow too much his/her ideas

Why can T-shaped people help to create innovative solutions³³?

T-shaped people usually are versatile and often all-rounders. They are able to contribute different point of views to a discussion and have the ability to take on a variety of roles. Based on their broad knowledge they do not fall into the trap of silo thinking. They enjoy more than others to work in a collaborative and knowledge sharing environment.

³³ Design Thinking Pocket Guide / Robert Curedale/ p 63



3. Classroom Setup

3.1 Creative Environment³⁴

Great workshop spaces are an often-overlooked instrument to create outstanding workshops with exceptional outcomes. Choose a space that is sufficiently large and offers large walls or working areas. Set up the space to support creativeness, collaboration and productivity. For breakthrough results, choose an unusual and inspiring venue if possible (e.g. unoccupied factory).

To change your classroom into a DT workshop room you can do the following:

- If possible move all chairs in one corner (pile them) and use the tables to form group areas
- Hang up posters to the walls, but reserve enough space for brown paper or just to use it to stick post-its on it.
- Think about the usage of the corridor or other spaces e.g. for energizer games
- Use the windows to stick post-its on them
- Provide all material needed especially post-its and handicraft material
- Ask your students to bring some handicraft material from home (for the prototyping phase)

Very often we get the feedback from SAP people and customers **that such creative rooms change the mood of the persons** due to the fact that the atmosphere in such a room is so different. It's easier to leave all the operational rush behind and relax and open the mind in this environment. We received very positive feedback from workshop participants who felt that it was easier to be creative and think differently.

The ideal workshop environment

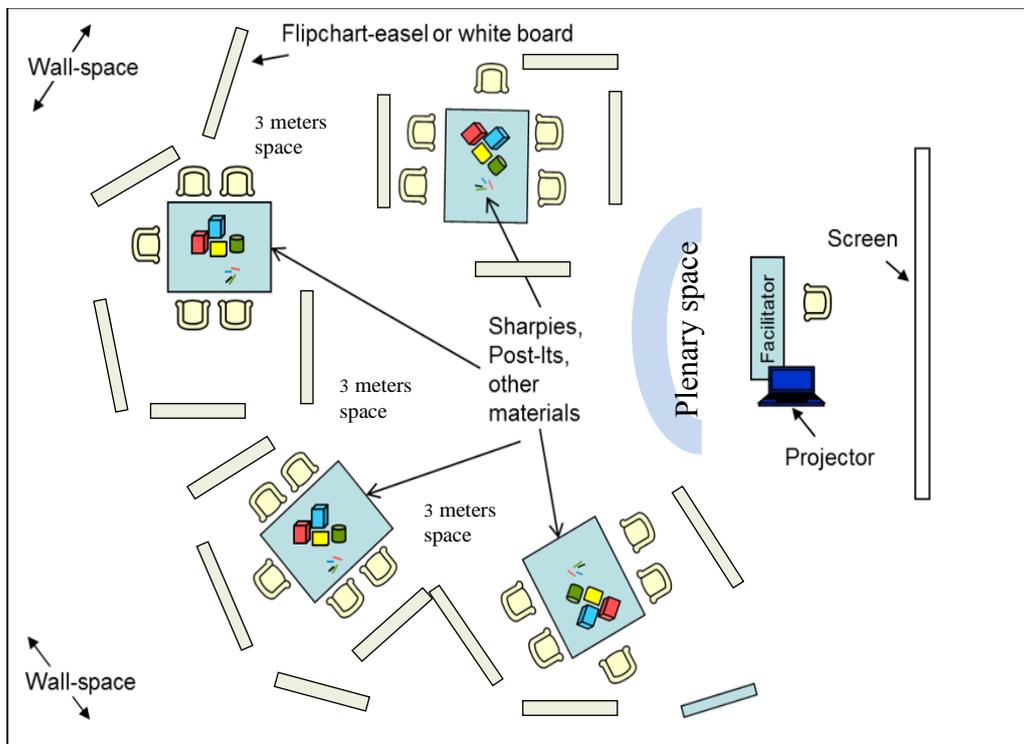
Walls³⁵:

Large vertical surfaces are indispensable, whether they are movable or part of the building. Make sure you can stick large posters, post-its, brown paper or flip chart paper on them.

³⁴ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 167

³⁵ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 167

Room Example³⁶:



Workspaces³⁷

This is where work gets done. Five to eight people per group is best. Do not use chairs or tables unless required for specific work. Keep working groups in the same room if possible rather than a break-out room to retain high energy level throughout the workshop. Provide movable furniture that the team can adjust e.g. using mobile tables for group working can be placed around in the room³⁸.

Projector and Screen³⁹

This is used to show slides or customer videos. It should be easily viewable by all. Ensure that you can dim the lights.

³⁶ Carsten Becker, SAP Deutschland SE&Co KG, DT internal material 2014

³⁷ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 167

³⁸ Robert Curedale / Design Thinking Pocket Guide ISBN: 8780989246859 / p 66

³⁹ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 167

Plenary space⁴⁰

Everyone can meet here for plenary presentations and discussions. Set it up without tables but with comfortable seats (sofa, armchairs,..). Could be the same area where the projector and screen is placed.

Venue Size, Look and Feel⁴¹

As a rule of thumb, calculate **10m² per 10 participants**. Favor inspiring venues over boring hotel meeting rooms.

Ensure that there is enough space for 'Energizer games'⁴² – in the same room or in the corridor or adjacent room.

⁴⁰ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 167

⁴¹ Value Proposition Design / Alexander Osterwalder, Yves Pigneur, Greg Bernada, Alan Smith / p 167

⁴² Energizer Games: Refer to Appendix



3.2 Material needed for a Design Thinking Workshop

Material you will need for a Design Thinking workshop:

Time Timer

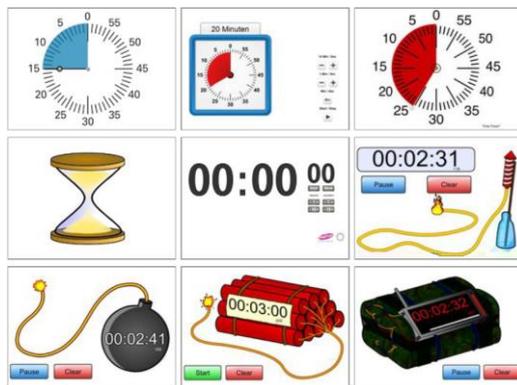


You can also use online versions:

Time timer: http://www.ict-cks.be/website/images/tools/tt_virtual.swf

Stop watch: <http://www.online-stopwatch.com/countdown-timer/>

Other watches: <http://www.schoolbordportaal.nl/timers.html>



Post-its

- Calculate 3 post-it pads per person per day:
- 1 x post it pad (127 x 76 mm)
- 2 x post it pads (76 x 76 mm)



Sticky dots



Felt pens (one Package colour pens for each team if possible, 1 black pen with a broad leading edge, e.g. Stabilo **pen 68**, for each participant):



Board Marker (one set for each team) participant)



Notepads (one for each



Craft stuff

Pipe cleaners



Brown paper



Styrofoam



Cardboard



All Kind of **Packaging material** (can be collected in households)



- **Foils**



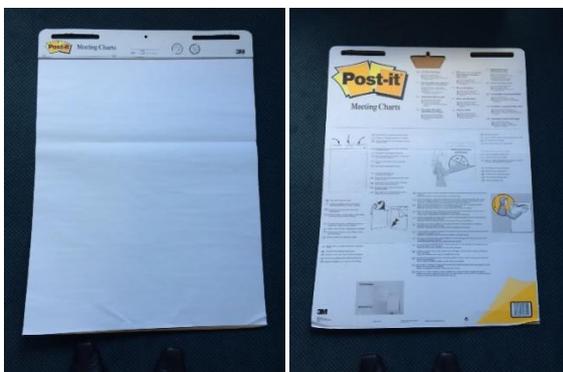
Tapes and Glue Sticks (2 per team)



Flip Chart (2-3 per Team) & **Paper** (1 block for each Flip Chart) or **Whiteboards** (2-3 per team)



Alternatively Post-it Meeting Charts



Pairs of scissors (2 for each team)



Fabric



Balloons



Blow Bubbles



As a minimum package you'll need:

Post-its (as mentioned above)
Notepads (for the Research phase – the interviews)
Sticky Dots (for the prioritization in different phases)
Brown Paper and Tape (to stick it on walls) or Post-it Meeting Charts
Pens to write on Post-its (with a broad leading edge e.g. Stabilo pen 68) and board marker to write on Brown paper or charts (as mentioned above)
All kind of tapes and glues (as mentioned above)
Pairs of scissors (as mentioned above)

Crafting staff (for prototyping) -> **Tip:** Ask each Design Thinking workshop member to collect 3 – 5 things from home (they do not expect to get it back) and to bring it to the workshop

Stop watch or Time Timer (one for each team + one for the leading coach)

Cardboard or packaging material (as mentioned above)

4. In-Class Design Thinking lesson and project delivery

4.1 Example Agendas and Design Thinking Project Plan

In this section we explain different Design Thinking Workshop formats and for what they are good for. You can see this workshops also as your education path to become a Design Thinking coach. Additionally it makes sense to create a Design Thinking project plan (for planning your Design Thinking activities aligned with a schedule).

DT in 1 hour:

Awareness Workshop based on the Wallet exercise of Stanford University⁴³. The target of this workshop is to let participants experience DT – without explaining the different process steps and methods. It's just a quick hands-on experience. You'll find in all this material in the DT Kit for Educational organizations (zip file)

- Example Agenda
- Slides

DT in a ½ day (4 hours):

Experience Workshop based on Gift Giving exercise of Stanford University⁴⁴ including a longer research part and time schedule for interviews. The target of this workshop is to let participants experience interviewing others. They learn how valuable it is to collect requirements and to find out the pains and gains of other people. They get a high level understanding of the process.

- Example Agenda
- Slides

⁴³ Origin material available at: <http://dschool.stanford.edu/wp-content/uploads/2013/10/METHODCARDS-v3-slim.pdf>

⁴⁴ Origin material available at: <http://dschool.stanford.edu/wp-content/uploads/2013/10/METHODCARDS-v3-slim.pdf>

DT in 1 day:

Experience Workshop based on a real challenge e.g. “How might I develop students to be active seekers of knowledge in subjects that they have little knowledge of?” In this workshop you give short introduction to the different DT process steps and use one creative method for each step. At the end the participants create a prototype to explain their solution idea.

- Example Agenda
- Slides

DT Project plan

- Example for Adaption

4.2 Generic Methods you can use in each DT Phase

4.2.1 Time boxing



Time boxing is used in a DT workshop to ensure that the team do not waste time and that they reach their target to find a solution. For each phase and activity an accurate timeframe should be planned.

Such plan is created by the coach prior to the workshop, for example when teams present their results to each other, we use only 10 minutes: <cross presentation 2 x 5';3' presentation; 2' Q&A>.

- The team thereby only uses the time planned for each step.
- That **requires a high discipline** from the participants as well as from the coach. This is being done to avoid that a team drops away by using time for chatting, texting via mobiles, or any other nonsense.
- Having the team working with **time pressure** they will **focus on** what they need to.
- As a coach however you work as a time keeper for the team.

In almost every Design Thinking Workshop we got feedback that participants want to have more time, no matter how much time they got! But on the other hand they were surprised what they have achieved and created in such a short time.

Therefore **do not hesitate to interrupt the participants when the time is over**. It is more disappointing for the participants if they cannot continue with the next steps or if they leave the workshop without a result. You need a **Time Timer which can be seen by everyone**. And you need to make sure that your team understands the task before timing it.

Dot Voting

Dot Voting is used as a method to collectively prioritize options, for example ideas generated from a brainstorming session within a Design Thinking workshop. It helps to sort out the ideas that are most “popular” very quickly.

Instructions:

Each person has a number of small dot stickers to “bid” for their favorite ideas. The group collaboratively decides on the best idea.

- Each person gets a set of small dot stickers (a set of 3 or 5 dot stickers work best, they can also use colored markers.)
- The ideas are put up on the wall/ flip chart/ whiteboard, and each person uses their stickers to “bid” on the ideas. They may put each sticker on a different idea, or they may put more than one on a single idea.
- When the bidding is over, stand back and look at the clusters of dots. Call out the ideas that had a significant number of votes. (Can also gather all ideas that had at least one vote.)
- Prioritize by using the number of dots posted
- Have a discussion around this smaller set of ideas

Very often the voting result is surprising – due to the fact that ideas get a higher vote which have not been popular when they have been introduced.

4.2.2 Usage of Post-its

Tips for writing post-its: Write meaningful post-its! Write in block letters – one aspect on one Post-it. Use a pen with a broad leading edge. Especially when you are in a hurry, the Post-its tend to be too short, unreadable and meaningless. Therefore constantly remind yourself about your writing style. Be visual!

Tips for peeling off post-its: Watch out this video:

<https://www.youtube.com/watch?v=Zj8EFqVoqYE> or refer to this resource:

<http://www.bartvermijlen.com/how-to-peel-of-a-sticky-note/>

Energizer game with post-its: <https://www.youtube.com/watch?v=Z171Jr1jB8s>



Color coding using Post-its

A color code is a system for displaying information by using different colors. Color Coding helps to dedicate the insights to the different users/customers. The color visualizes in a simplified way which input belongs to e.g. a topic or to a person.

E.g. you can choose for each topic or interviewee one color of Post-its (e.g. yellow for the 1st topic, pink for the 2nd topic, and so on) when you fill out the Experience Map or do story telling after conducting interviews.

Please have in mind: Color codes are often difficult for color blind and blind people to interpret.

4.2.3 Brainstorming

In each phase you can do [Brainstorming](#)⁴⁵. **Brainstorming** is a group or individual creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its member(s). Brainstorming is more effective than individuals working alone on generating ideas.

Refer to facilitating brainstorming⁴⁶ in the IDEO Educators guide.

Instruction

Review the context information for the problem you want to solve with the team. Start the Brainstorming by generating ideas for one topic at a time. Write down ideas on post-its (one idea per post-it, drawings welcome!). Read out the post-its and stick them to the wall. Others can build on top of these ideas by quietly writing additional ideas on post-its and reading them out in the next round. Take turns until all ideas are out on the wall or until time is up. Cluster the ideas to find themes. Identify the most promising ideas by dot voting or discussion.

Purpose:

Rapidly generating a large quantity of ideas. The goal is to generate as many ideas as possible and get those ideas out of people's heads so others can build on them. Brainstorming can be used in all stages of the process.

What to use:

Post-its, pens, Whiteboard or Flip Chart

Duration:

⁴⁵ Follow the [link](#) to different Brainstorming Methods

⁴⁶ Design Thinking for Educators 2015/ p 52 / available online: <http://www.designthinkingforeducators.com/toolkit/>

10 minutes

What do your students learn?

To stay focused on the topic, to build on the ideas of other and to defer judgment.

4.3 Checklist for DT Workshop

As mentioned above a Design Thinking coach is responsible to organize the workshop. Therefore a lot of things should be considered:

1.	Define a challenge and decide who will work on it (e.g. which group of students, teachers)
2.	Prepare the agenda, the slides you'll need and the hand-outs for the Design Thinking workshop participants, together with all coaches
3.	Reserve a room for the workshop (or plan time to prepare a room with the Design Thinking workshop participants)
4.	Announce the Design Thinking Workshop and invite the Design Thinking workshop participants
5.	Invite additional coaches (if the group is bigger than 10 people)
6.	Ensure that all material you'll need is available in the room
8.	Prepare the Energizer games ⁴⁷ together with all coaches
9.	Create an agenda flip chart – visible for the Design Thinking workshop participants
10.	All coaches meet 30 minutes earlier in the room on the workshop day for last minute alignments

Now you know all you need to set-up a Design Thinking workshop. In the next chapter you learn what Design Thinking is, the Design Thinking process, the different phases and methods to use. You find also exercises and step-by-step descriptions to do Design Thinking.

⁴⁷ You'll find energizer games for each phase in the appendix of this document

5. Understanding Design Thinking

5.1 What is Design Thinking⁴⁸?

“Most project-based/problem-based learning examples I ran into (or created myself) still treated school and the real world as distant allies, not as rigorous partners that had to work hand in hand. It wasn’t until I discovered the concept of design thinking (DT) that I could finally see a new way to challenge our students to become agile thinkers and collaborators in an effort to solve meaningful problems anchored in authentic experience. Even better, DT demonstrated how my students could create their own learning from beginning to end.”⁴⁹

Design Thinking is a solution oriented process as well as a toolbox with different methods.

- Design Thinking teaches people **to think like designers**: Before designers start to create a product, they try to understand the problem or issue by observing and talking with customers.
- Usually they create models or prototypes which they validate with their target group.
- The creative part of design is to create ideas to solve a problem – sometimes to change an existing product which is a shelf warmer or outdated.
- And one important point in Design Thinking is: Fail early and often – meaning that before a product goes to market several tests have taken place and the feedback leads to changes.

“And yet, when we really look at what learning in the digital age is about— fostering multidisciplinary collaboration to solve increasingly complex problems with no clear answers — it seems impossible to imagine that an educational culture built on confirming “right answers” within predictable training scenarios offers our students a viable way forward. Perhaps in the past when learning outcomes were more static, we needed students to be predictable. Tomorrow, however, we’ll need agility, divergent thinking patterns, and an ability to test ideas in messier ways. In other words, we need digital age learners to be comfortable with failure. And we need learners who know how to fail better.”⁵⁰

How can we describe Design Thinking? See the following aspects of Design Thinking, created by Stanford University⁵¹

²⁴ <http://eric.ed.gov/?q=Design+Thinking>

⁴⁹ Christian Long/ Article: Teach your Students to Fail Better with Design Thinking 2012/ p 17 article available: <http://files.eric.ed.gov/fulltext/EJ982832.pdf>

⁵⁰ Christian Long/ Article: Teach your Students to Fail Better with Design Thinking 2012/ p 17

⁵¹ Design Thinking for Educators 2015/ p 11 / available online: <http://www.designthinkingforeducators.com/toolkit/>

5.2 Design Thinking is a mindset⁵²:

Design Thinking is about believing we can make a difference, and having an intentional process in order to get to new, relevant solutions that create positive impact. Design Thinking gives you faith in your creative abilities and it is a process for transforming difficult challenges into opportunities for design.

And Design Thinking is a **solution oriented process** – the mindset of Design Thinkers is that for each problem a solution can be found.

It's Human-Centered⁵³:

Design Thinking begins from **deep empathy** (stepping into the shoes of others) and **understanding of needs and motivations of people** (their goals and pains) — in this case, the students, teachers, parents, staff and administrators who make up your everyday world.

It's Collaborative⁵⁴:

Several great minds are always stronger when solving a challenge than just one. Design Thinking **benefits greatly from the views of multiple perspectives**, and others' creativity bolstering your own.

It's Optimistic⁵⁵:

Design Thinking is the **fundamental belief that we all can create change** — no matter how big a problem, how little time or how small a budget. No matter what constraints exist around you, designing can be an enjoyable process.

It's Experimental⁵⁶:

Design Thinking gives you permission to fail and to learn from your mistakes, because you come up with new ideas, get feedback on them, then iterate. Given the range of needs your students have, your work will never be finished or “solved.” It is always in progress.

Yet there is an underlying expectation that educators must strive for perfection, that they may not make mistakes, that they should always be flawless role models. This kind of expectation makes it hard to take risks. It limits the possibilities to create more radical change. But educators need to experiment, too, and Design Thinking is all about learning by doing.

⁵² Design Thinking for Educators 2015/ p 11 / available online: <http://www.designthinkingforeducators.com/toolkit/>

⁵³ Design Thinking for Educators 2015/ p 11

⁵⁴ Design Thinking for Educators 2015/ p 11

⁵⁵ Design Thinking for Educators 2015/ p 11

⁵⁶ Design Thinking for Educators 2015/ p 11

In short, Design Thinking is the confidence that new, better things are possible and that you can make them happen. And that kind of optimism is well-needed in education.

What can I use Design Thinking for⁵⁷?

There is a consistent set of **challenges** that teachers and schools seem to face, and they **center around the design and development of learning experiences** (curriculum), learning environments (spaces), school programs and experiences (processes and tools), and system strategies, goals and policies (systems).

Sometimes these challenges are tackled by a central team — especially for the more complex challenges that involve multiple stakeholders; sometimes challenges are addressed at the school level, with a core team of representative educators driving the process; and sometimes these challenges are addressed by educators or small teams of educators themselves... **which is where grassroots change begins to happen.**

Curriculum⁵⁸:

Every day you design ways to interact with your students around content. You can follow a design process **to be more intentional** about connecting this content to the interests and desires of today's learners **by finding out more about the things that they do outside** of school and connecting that to the content you are bringing to them.

Spaces⁵⁹:

The physical environment of the classroom sends a big signal about how you want your students to behave. Right now we tend to think of our classroom spaces as standard... kids in rows, sitting at desks. **By rethinking the design of our spaces, we can send new messages to our students about how they should feel and interact in the classroom.**⁶⁰

Processes and tools⁶¹:

Your school has already designed a set of processes or tools that may or may not be setting up your school for success. This is **typically outside of the classroom** and specific interactions around learning, and more around how the system operates. **Every process is already designed, and thus can be redesigned!** Sometimes creating tools can be essential to supporting newly designed processes.

Systems⁶²:

⁵⁷ Design Thinking for Educators 2015/ p 12

⁵⁸ Design Thinking for Educators 2015/ p 12

⁵⁹ Design Thinking for Educators 2015/ p 12

⁶⁰ Refer to section 3.1 of this document: To change your classroom into a DT workshop room you can do the following things

⁶¹ Design Thinking for Educators 2015/ p 12

⁶² Design Thinking for Educators 2015/ p 12



Not everyone can always make decisions for the system that they exist within, but **everyone can contribute to the design of that system**. Designing systems is about balancing the complexity of many different stakeholder needs with the operative needs. When designing systems, we're often setting high-level strategy such as stating visions, priorities, policies, and key communications around these **ideas**:

- How might I inspire students to engage in environmental issues?
- How might I engage my students in compelling ways around learning world history?
- How might I develop students to be active seekers of knowledge in subjects that they have little knowledge of?
- How might I help children from disadvantaged backgrounds increase their vocabulary?
- How might I use my classroom space in different ways to help set my students at ease?
- How might I create a comfortable space that meets the many needs my students have throughout the day?
- How might we reorganize and restructure our school's library for the needs and interests of today's learner?
- How might we create an exciting and effective space for teachers to collaborate?
- How might we design our high school campus to best engage and support today's learner?
- How might I engage parents as an integrated part of their students' learning experience?
- How might we recruit the best teachers?
- How might we redesign the arrival and departure procedures at our school?
- How might we design ways to keep ourselves balanced and well?
- How might we redesign our school schedule to be centered on the needs of today's families and teachers?
- How might we redesign the curriculum for an entire district while providing for individual schools' differences?
- How might we track the development of students' character traits over time to help shape our school philosophy more intentionally?
- How might we connect more effectively with our neighborhood community?
- How might we use our school as a Research & Development hub for schools nationwide?



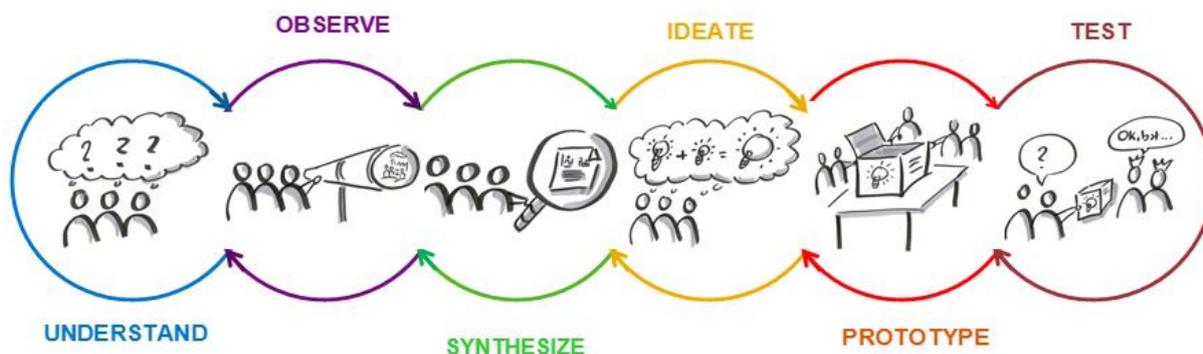
6. The Design Thinking Process (6 phases)

The design process is what puts Design Thinking into action. It's a **structured approach to generating and evolving ideas**. It has six phases that help navigate the Design Thinking team from identifying a design challenge to finding and building a solution.

After you **iterated your prototypes** and when you think you and your target group are satisfied you can step into the 'implementation phase' – which is not a Design Thinking phase, but the next step to **bring your solution proposal into real life**.

It's a deeply human approach that relies on your ability to be intuitive, to interpret what you observe and to develop ideas that are emotionally meaningful to those you are designing for — all skills you are well versed in as an educator.

The process is iterative - which means you collect for each outcome (phase result) and if necessary you can start at each phase again or go back to each phase.



The first 3 steps of the design thinking process helps us find the right question.

The last 3 steps of the design thinking process helps us pinpoint solutions.

Understand: in this phase your team gets a common understanding of the problem or challenge the team will deal with.

Research: Research your user by doing observation or conducting interviews – try to step into the shoes of the people (your target audience).

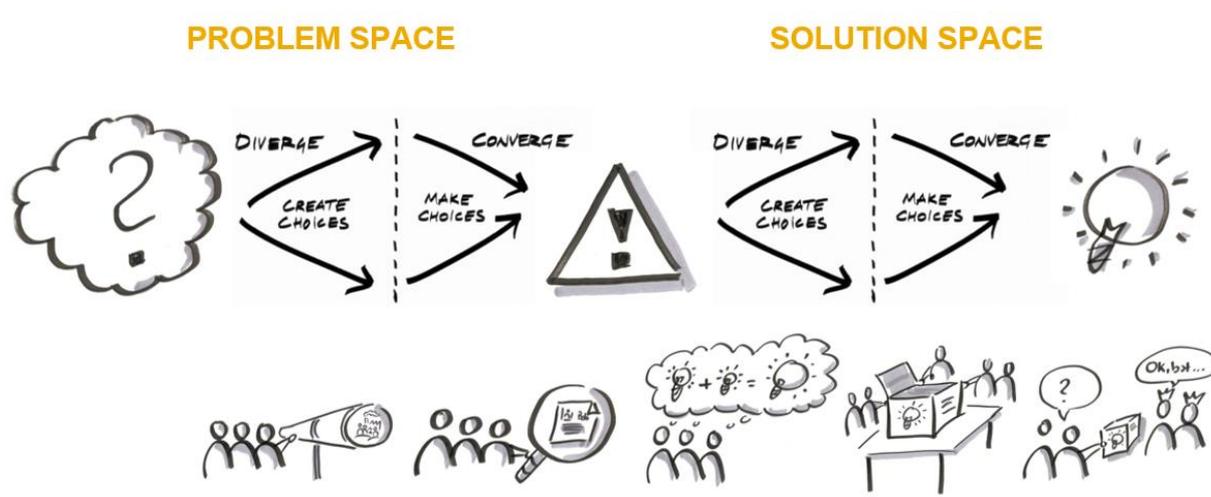
Synthesize & PoV: Summarize your findings by speaking about pain points, patterns and unexpected results, formulate the Point of View of your target persona.

Ideate: Now you can create ideas – wild, crazy and abstruse, all ideas are allowed!

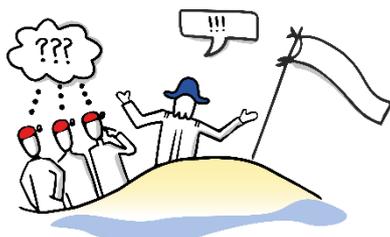
Prototype: Decide which idea you would like to test and build a prototype to explain this idea (Storyboard, role-play, mock-up, and process charts – whatever shows the solution idea).

Test: Collect feedback for your prototype – avoid to defend your prototype – each feedback is beneficial and should be used for improving the prototype. Very often target group users explain things they did not explain before, when they ‘experience’ the prototype.

A bird’s-eye view of the design thinking process



Notice that both the problem space and the solution space **contain diverge (collecting of content) and converge (prioritization of content topics) phases**. The diverge and converge phases are also some-times referred to as “flare” and “focus”. In other words: The Design Thinking team collects a lot of input during the understand and research phase. And it is very hard for the team to summarize and to prioritize the whole content. The same happens in the ideation and prototyping phase – **the Design Thinking team will go through the experience to make hard decisions and to leave things behind.**



6.1 Understand

Tip: Before you start with the understand phase **use an energizer game**⁶³ for the participants, **we recommend** to use one of the following:

- [Scissors, Paper, Rock](#)
- [Howdy Howdy](#)⁶⁴
- [Juggling Ball Game](#)⁶⁵

In the understand phase the overall target is to create a **common understanding** in the team – which skills the team provides, what does the challenge or problem means, who will be the target audience, how does the context and environment of the target users look like, and about the terms and definitions used for the challenge description.

Activities:

- Team building
- Creation of an overview of team skills
- Ensure that all team members knows the target of this phase
- Brainstorm on the challenge
- Creation of a common understanding of the challenge
- Team define, scope and refines challenge
- Creating a DT project plan (only if the DT Workshop is longer than 1 day)
- Setting up of a research plan

The outcome of the understand phase:

- A team 'picture'
- A reframed challenge
- A description of underlying process or the situation of the challenge
- A Design Thinking project plan (only if necessary refer to above)

⁶³ You'll find them in the appendix of this document

⁶⁴ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNxsx909VoHmp6ZQhcQw&bvm=bv.96339352.d.bGQ

⁶⁵ dito

- A research plan

Recommendation: Use all results of the understand phase and iterate them with your target group (if you misunderstood your target group you'll find out).

Methods to use in the Understand Phase

6.1.1 Check which skills are in the team (essential)

To better understand who is in the team and which skills each one has, you can do a **short exercise**: [T-shaped people](#)

Instruction:

Divide the team into pairs. Let them talk about their T-shape (by filling out the template you'll find in the zip file) in a 5 minutes interview for each of the two. When the time is over, stick the T-shape forms on a wall, visible for all during the workshop.

Purpose: Build understanding in the team, 1st experience on interview techniques

What to use: T-shape form, pens

Duration: 15 minutes + 1 minute T-Shape presentation per participant (5 minutes to explain the T-Shape concept and template, 10 minutes for the 2 interviews, 1 minute for presentencing T-shape per person)

Participants: All workshop participants

What do your students learn? Students will learn how valuable it is for a group or team to have different people in the group and that everyone has more knowledge than they expect.

6.1.2 Define your challenge (essential)

The design challenge is the starting point. Describe the problem you would like to work on. It's important that the description is not too broad so that the team will not be confused or get lost.

A method we recommend for defining the problem statement is **Assumption Dumption**⁶⁶ (essential).

Instructions:

Workshop Participants state their assumptions (may include: perceptions, requirements and/or constraints) about a situation or the problem. Then they try to **reverse** the assumptions to see if new opportunities are revealed.

⁶⁶ Adapted from SAP SE DT Toolkit Framework / Meta Patell 2013

- Reverse assumptions to give a fresh perspective on ideas, values and beliefs – not unlike standing on one’s head!
- Generate a rich discussion to help team members understand each other’s point of view
- Help the team dive more deeply into the problem to discover its true source.

Tips for holding a successful session:

- Be sensitive to emotions that can be attached to beliefs when “unpacking” assumptions.
- One dumped assumption may reveal others to be explored.
- Write assumptions in large print and keep them visible (e.g. write the assumption on a large post-it and stick it to the wall, or on a brown paper.

Purpose:

Challenge your assumptions of what you believe to be true, expand view points and open minds.

- Explore things your target group people may not have considered
- Create additional questions to ask based on the insights from the exercise

What to use: Whiteboard, Post-its, pens, Time Timer

Duration: 20 minutes

What do your students learn? They will learn to examine a topic from different perspectives

6.1.3 Reframe your challenge (optional)

In case you get your challenge/topic to work on with Design Thinking from a stakeholder, you as a coach should ensure that everybody in the team understands what is meant.

The **Thesaurus**⁶⁷ Method can help achieve this goal:

Instructions: Motivate the team to:

- Examine the problem statement and identify the keywords
- Change the key words so that they are close but different

Change each key word 5-10 times by thinking of words that are similar.

Example

⁶⁷ Adapted from Instant Creativity 2007 p 38 / ISBN-13: 978-0749448677

“Redesign the experience of arrival and departure procedures at our school”

Appear? To come across? To approach?/ To derelict? To leave? To go away? Action? Case?

Mix and match the new words to make new problem statements and post them up where everyone can see them

Use the new statements to enhance the understanding of the problem

If you come up with solutions, go ahead and park them separately, but try to “stay in the problem”.

Purpose: Problem Framing

What to use: Whiteboard, Whiteboard Marker, Time timer

Duration: 7 – 15 minutes

What do your students learn? To play with different meanings and to think laterally

Example of a broad challenge:

“Redesign the experience of people in an official building using state-of-the-art technology to optimize their daily work”

This challenge should be re-framed – questions which come up reading this challenge:

- Which people do you like to focus on (people working in the building? Customers?)
- Which kind of government building is meant?
- What is “state-of-the-art technology”?
- What does “optimize” mean?

6.1.4 Alternative Reframing Method - Creative Reframing⁶⁸:

Each team member has an individual view on the challenge. Invest time to discuss in a structured way using Creative Reframing (**exercise**): You intensively talk about the challenge

- Write down your challenge
- Underline keywords
- Brainstorm thoughts per keyword and optionally discuss constraints

Reframe the challenge

Instruction:

- Write the challenge on a whiteboard or flipchart.

⁶⁸ Adapted from SAP SE DT Toolkit Framework / Meta Patell 2013

- Underline key words.
- Create a table (for each keyword one column).
- Provide post-its for each team member; now let them reflect about the 1st key word – what does this mean for each of them? Let them mark down their thoughts on post-its.
- After 5 Minutes let each group member stick his/her post-its into the column on the whiteboard by explaining the thoughts if necessary.
- At the end let the team decide which definition will fit for them all. Do this for each key word.
- Let them also think about constrains – what could be a limitation or a barrier?
- At the end reframe your challenge.

Purpose: To create a common understanding of the challenge, to formulate the challenge that everybody in the team confirms that he/she works know with the definitions created.

What to use: Whiteboard, table, post-its, and Time timer

Duration: Underline Keywords: 3 minutes; Brainstorm each key word 10 minutes, Discuss potential constraints 5 minutes, and rephrase the challenge 7 minutes.

What do your students learn? They learn to clarify and precise content.

Example of the broad challenge from above now reframed

“We will redesign the immigration process office in Mexico from duty to pleasure for applicants who want to travel to the US”

6.1.5 Define the scope for your challenge and define project plan (essential)

Scoping means you need to define what the problem space is and what you need to know to make insight-based decisions. Sometimes it is useful to describe **what is in and what is out** – e.g. on which scenario or process step or target group you would like to focus and on which part of the problem you will not work.

The outcome of the scoping should be a problem statement (reframed challenge) and your project plan (how you would like to work on the challenge – a Design Thinking project plan). And you should identify the areas where you need to learn more to understand the whole challenge.

Using our reframed challenge example from above:

“We will redesign the process of the immigration office in Mexico from duty to pleasure for applicants who want to travel to the US”.



In scope: First application for immigration and target group applicants in Mexico who want to travel to USA.

Out of scope: The immigration officers, other processes e.g. updating of immigration papers, other countries (for departure and arrival).

Next step will be to describe the process (visualize it by using an **Experience Map** or the **CFB Method**).

6.1.6 Use the Experience Map⁶⁹ (optional)

The goal of a User Experience Map is to **understand the experiences of people going through a 'Journey' using the current solution**. Ideally the Experience Map is done together with the target audience. It's important that they explain the different steps of the process (called actions), which is the starting point for the process description (in the middle of the template).

If you use it in the 'Understand phase' describe the process using assumptions – **but mark all assumption** (e.g. with a different color or sign on the post-its). You also add the touch points and the mindset of the person who is doing the 'journey' to find out where process gaps or fractions might exist. The Experience Map includes a short target group and target person description (on the left) and a parking lot for ideas (on the right).

Instruction: Define the person, which is doing the journey. Ask the participants to write the scenario of journey on post-its. Use 3 different colors (one color for each row) and swim lanes **for the actions** (start with them), **the touch point** (continue with them) and for the mindset (ask people what they think when they do this action) of the **target person**.

Whenever ideas for the future solutions appear (e.g. suggestions for improving the process) post them to the ideas section, but focus on the experience of the person. Try to walk into the shoes of this person. Present the map to additional target persons and collect feedback.

Actions: are the process steps

Touch points: are other persons, systems, artifacts used doing a process step

Mindset: Are the thoughts or comments persons say when processing an action

Purpose: Tool to explore the journey your target persons go through during a specific event. Find out human meanings, uncover unknown problems and generate new ideas. The Experience Map is a good preparation for the research phase.

What to use: [Experience Map Template](#), Post-its in different colors, pens

⁶⁹ Adapted from: Gamestorming: A Playbook for Innovators, rulebreakers, and Changemakers/ 2010/
ISBN-13: 978-0596804176

Duration: 45 minutes

What do your students learn? Your students learn to visualize a process and to discover what will be additionally used in a process. This supports holistic thinking. By doing an iteration of the map (presenting it to additional target group persons) they learn to accept with feedback.

6.1.7 Current / Future / Barrier Method (CFB)⁷⁰ (optional)

Using this method could be very valuable for the workshop participants.

They first are allowed to describe the current situation – with all critical aspects. Very often that helps them to realize what the problems are and to look forward.

Especially when they, in the next step, can create a picture of the future. This could be seen as a wish list or vision how the situation would be (without having any constraints, like effort or money), when they think about the future.

As a third step the participants collect the barriers they see today. When the [CFB template](#) is filled out, you can formulate challenges from the current and barriers column and a vision from the future column.

You can use the CFB method for processes as well as for all other issues.

Instruction:

- Use the CFB template and use vertical flip chart paper, taped in a row.
- Title the 1st column **Current** the 2nd **Future** and the 3rd column **Barriers**
- Use post-its to note everything that the group knows about the current and future situation and the barriers.
- Use Dot Voting for the ideas which are in the barrier column – to let the team decide for which barriers they would like to work on.

If you work in different teams you can do peer presentations to compare the outcomes.

Tip: The ideas which you collect for the future, can also be used in the ideation phase.

Purpose: To develop the problem statements and clear understanding of current situation

What to use: CFB Template, post-its, pens

Duration: 30 minutes (10 minutes for each column)

⁷⁰ Cracking Creativity, Michel Michalko

What do your students learn? To think about the future (e.g. what will the situation look like in 10 years) which is something they usually do not do. They also learn to create a vision.

If your time allows it, it would be **meaningful to iterate the outcomes:** The Experience Map as well as the CFB form. You can iterate both forms with your target audience. They will give you feedback if the Experience journey matches their processes and if the current situation and barriers are properly described or not.

6.1.8 Create your Research Plan⁷¹ (essential)

The last step in the 'Understand phase' is to create a research plan. You now have a common understanding of the challenge and the target audience. It is now time to go out and talk to people. There are many things to juggle when you are out in the field. The more you plan ahead of time, the more smoothly the process will go. However, be prepared to frequently adjust your plan. Often, new ideas will take you in a different direction from what you initially anticipated. The process of planning is as important as its result.

Create a [Research Plan](#) by using a time table (or the suggested template).

- Describe the people you want to meet
- Plan interaction and logistics
- Invite participants or decide where you can meet your target persons
- Track your progress
- Create a calendar with meetings and responsibilities

Tip: Create a shared online document with access for all team members.

Before you go to the next phase **iterate your results of this phase with your target audience** (except the research plan).

You'll find further Methods for Understanding (e.g. [Charretting](#), [Business Model Canvas](#), and [Gameplan](#)) in the [Appendix](#).

⁷¹ Adapted from Observation Field Guide p. 4/ SAP SE/ Sabrina Steinmetz 2014

Troubleshooting:

Situation	Solution
People using Cell phones or other devices during the group work ⁷²	Encourage them to use the breaks or to step out of the room – or if the participant disrupt the team, it is O.K. to them to leave – so that the rest of the team can fully experience the workshop.
People leaving early ⁷³	Not much you can do – if a team is significantly reduced by early departures, the coach can temporarily fill on open spot – and if the decimation is known early on, you can move persons from another team
All team members are on the quiet side ⁷⁴	Draw them out by specifically addressing questions to them. You may have to stay more engaged with that type of participants
Participants ask many questions about the challenge and launch a discussion about what each understand before executing the first scoping exercise ⁷⁵	Especially in the beginning of a project, the team has no collective mindset yet. This mindset has to be created by discussions and sharing thoughts within the team. Airtime for everyone is pivotal
Team members come back late after a break.	Start each session on time – do not wait for people who are late.
Teams are questioning, whether the challenge is really a challenge or believe, they know the solution already (“I know the solution...”) ⁷⁶	Step in, if teams try’s to solve the challenge already in the scoping phase. Explain the purpose and importance of scoping and deep understanding of the problem
Teams want to reframe the challenge ⁷⁷	Sometimes playing around with the challenge can be a really creative exercise. Therefore, reframing is allowed and natural as long as the team and stakeholders agree with it
Team memebers do not know where they can meet the target persons	Consult them to find it out – suggest places where they can meet target persons (in the street, on public places, universitites, social oraganizations, churches, shopping malls,

⁷² Tips & Tricks for DT Coaches Version 2.0, Martina Schuh/Claudia Diesner, SAP SE 2013

⁷³ Tips & Tricks for DT Coaches Version 2.0, Martina Schuh/Claudia Diesner, SAP SE 2013

⁷⁴ Tips & Tricks for DT Coaches Version 2.0, Martina Schuh/Claudia Diesner, SAP SE 2013

⁷⁵ DT presentation provided by Thomas Eckert, SAP SE 2015

⁷⁶ DT presentation provided by Thomas Eckert, SAP SE 2015

⁷⁷ DT presentation provided by Thomas Eckert, SAP SE 2015



6.2 Research⁷⁸

As a `Design Thinker` you need to understand the people for whom you are looking for a solution. The problems you are trying to solve are rarely your own - they are those of particular target persons; in order to design for those, **you must build empathy** for who they are and what is important to them.

Watching what people do and how they interact with their environment gives you clues about **what they think and feel**. It also helps you to learn about what they need. By watching people you can capture their experiences, what **they do and say**. This will allow you to interpret intangible meaning of those experiences in order to **uncover insights**. These insights will lead you to innovative solutions. The best solutions come out of the best insights into human behavior. There are different methods of observation to develop empathy:

- Ask and listen – Interview users.
- Watch and observe – View users and their behavior in the context of their lives.
- Try and do – Immerse yourself to better understand the situation that your users are in and whom you are designing for.

Recommended Energizer Games for the Research Phase:

- [Alter Ego](#)⁷⁹
- [Interview freeze tag](#)⁸⁰
- [Observed accurately](#)⁸¹
- [Who are you?](#)⁸²

Activities:

- Team starts to prepare the research (prepares the material, decides if they will do interviews, observation,..)
- The team creates a questionnaire

⁷⁸ Adapted from Stanford d.school's Bootcamp Bootleg and many others

⁷⁹ Adapted from Martina Schuh/ DT Games / SAP SE 2013

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⁸² 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHmp6ZQhcQw&bvm=bv.96339352.d.bGQ

⁸² dito

- Conduct an interview dry-run
- Executes interviews
- Summarizes after each interview (what was common? What is surprising?...)

The outcome of the Research phase:

- Questionnaire
- Interview results
- Empathy Map (essential)
- Experience Map (optional)
- Stakeholder Map (optional)
- Storyboard (optional)

Methods to use in the Research phase:

6.2.1 Identify People to Speak with⁸³ (essential)

A deep understanding of peoples' motivations and needs is the best foundation for any solution. Engage with a **broad spectrum of people** who will be affected by what you will create.

For research meant to inspire new opportunities, it is useful to **find people who represent "extremes"** and understand their needs and gain insights into their lives. You can also draw inspiration from their workarounds and frameworks. When you speak with and observe extreme users, the needs are amplified and their workarounds are often more notable. However, the needs that are uncovered through extreme users are often also needs of a wider population.

By **including both ends of your spectrum** as well as some **people in the middle**, the **full range of behaviors, beliefs, and perspectives** will be heard even with a small number of participants. Including this full range will be important in the later phases, especially in constructing good frameworks and providing inspiration for brainstorming.

- Additional Sources of Inspiration
- Subject Matter Experts (e.g. Alumni's, students of pedagogy, and people working in school government department,)
- Competition (other schools)
- Inspiration and Trends (e.g. www.trendwatching.com)
- Analogous Situations (e.g. use Method [Visual Analogy](#) or think about an analog environment)
- Stakeholders (neighborhood of your school, parents, teachers in retirement,...)

⁸³ Adapted from Observation Field Guide p. 3/ SAP SE/ Sabrina Steinmetz 2014

6.2.1.1 Visual Analogy ⁸⁴(optional)

Once the problem statement is well defined you need to open up people's thinking and creativity. Let them find analogous situation (from the e.g. flora and fauna, physical things, other environment). An **analogy** denotes similar situations or objects which are related to each other. An analogy exists if one attribute is very similar, also if they are very different in all the other attributes. Example: Think about a team in the school environment and compare it to a rugby team.

Instruction:

Sketch your problem or customer as if it were a physical thing or environment. Make connections between the parts of the physical thing and the elements of the problem.

- Ask each person to sketch the target person, situation, or problem as if it were a physical thing or environment. Be specific: "If this person was a car, what would it be like? Take 5 minutes to sketch a picture of your car – what features does it have? Add those and label them"
- If needed, ask questions about the parts to help people break it down. "Who or what is the steering wheel/ passengers/ chassis/ motor/ wheels/ fuel?" If you have time or want to direct focus, ask about other parts of the environment. "What is the street like?" "What are the other cars like?"
- Have each person show and explain their sketch while the rest ask questions.
- Capture key insights in large format (whiteboard / flipchart/ stickies) as the conversation unfolds.

Examples of physical objects and environment: car, playground, meal, amusement park, airplane, house, restaurant, mall, submarine, city, kitchen, cruise ship, building, animal, store, living room, board game, zoo

Purpose: The purpose of this method is to bring new insight to an existing problem and to let people be candid about their views

What to use: Pens and paper for the sketches, Flip Chart or Whiteboard, post-its

Duration: 10 – 30 minutes (5 minutes for drawing, rest of the time for showing and explaining)

What do your students learn? They will get new perspectives and understanding of the problem space and experiment with creative thinking.

⁸⁴ Adapted from 75 Tools for Creative Thinking by Booreiland <http://75toolsforcreativethinking.com/>

Analogies often lead to surprising solutions. Changing the environment or thinking about different situations, helps to open the eyes for solutions you have never thought about.

6.2.1.2 Create Stakeholder Map (optional)

Stakeholder⁸⁵ mapping defines the roles of people and their relationships in a “human-centered system” view. It provides a way of visualizing the various dynamics in play, including motivations, influence and relationships in this system.

Instruction:

- Work with your challenge and identify the stakeholders
- On individual post-it, capture all of the relevant stakeholders that may be affected by or have an impact in the challenge/scenario. Think internal : external
- Select either a single stakeholder or a group of stakeholders that best represents the center of focus for the challenge/scenario
- Place stakeholders on your stakeholder map appropriately, visually displaying their relation to the problem and to each other?
- Use the identified stakeholders to determine whom to interview and observe during the research phase

Purpose: Understand key stakeholders and how they interact and influence each other

What to use: [Stakeholder Map Template](#)⁸⁶, pens and post-its

Duration: 30-60 minutes

What do your students learn? To visualize a network / stakeholder eco-system, to help identify other opportunities. There are always people who influence others (that is also true for their own life).

6.2.2 Build a Question Guide⁸⁷ (essential)

Time with target persons is precious; **we need to make the most of it!** While we always must allow room for the spontaneous user-guided conversation, **we should never neglect our responsibility to prepare for interviews.** You may not get to every question you prepare, but you should come in with a plan for engagement.

Tips: While preparing the questionnaire consider the following aspects which influences the number of your questions:

⁸⁵ A Stakeholder is a person, group or organization with an interest in a project

⁸⁶ more info: <http://www.stakeholdermap.com>

⁸⁷ Observation Field Guide p. 5/ SAP SE/ Sabrina Steinmetz 2014

- You'll always have a certain time to ask questions but also for consolidating/ summarizing the answers. The number of teams and the number of interviews per team influence how many questions you will be able to ask.
- All members in a team should use the same questions so that the answers can be compared during the consolidation
- Due to these facts 3 – 5 questions are enough and don't forget to ask 1 to 3 times: WHY? When you'll get an answer (which will expand your number of questions but will let you find out more about what motivates the person)

Tip: You can test the questionnaire in the team to determine how much time the interview will consume.

Exercise: Brainstorm questions and frame them as **open questions**⁸⁸, such as:

- Tell me about an experience...
- What are the best/worst parts about...?
- Can you help me understand about...?
- What is your most time consuming activity?
- If I am a fairy and you have 3 wishes – what will they be?
- Don't be shy to ask 'why' if you got the answer, sometimes you need to ask 'why' 3 times
- Encourage people to tell you their whole story and **avoid yes/no** questions. Organize your questions using the following structure: Start specific: Begin with questions your participants are comfortable answering.
- Go broad: Ask more profound questions about hopes, fears and ambitions.
- Probe deep: Explore your challenge or any interesting theme you picked up during the conversation in more depth. Consider prompting thoughts with "what if" scenarios.
- Build tangible conversation starters.
- It can be helpful to share early ideas or concepts in your conversation, particularly when you are working on an abstract challenge.
- You can create a sketch, build a simple cardboard representation, and describe a scenario (e.g. the Experience Map from the 'Understand phase' that your participants can respond to.
- Your idea does not have to be realistic - it only serves the purpose of gaining a better understanding of your topic.

Tip: Create a question guide that is very readable, so you can glance at it quickly during your Conversation. Prepare also a sheet of paper for the notetaker – to easily edit the answers to each question.

⁸⁸ Adapted from Observation Field Guide p. 11/ SAP SE/ Sabrina Steinmetz 2014

6.2.3 Prepare for Fieldwork⁸⁹ (essential)

Fieldwork activities run smoother with thoughtful preparation.

Checklist:

Step	Activities
Confirm your plans	Confirm date, time and location for your research activities (use the research plan created in the Understand phase, update it if necessary)
Prepare Your Equipment	Agree on logistics, including transportation, with your team. Make sure to gather materials (like pens, notepads, paper, camera (check batteries, to take pictures,...) for your fieldwork ahead of time.
Question guide	Ensure that the question guide is available for each team
Contact data	Make sure that Participants' contact details, Team members' contact details as well as Mobile phones are available in each research team.
Directions to location	Remind each team that they have a map or something similar at hand.
Prepare for the end of an interview	Don't forget to say 'Thank you' and if applicable hand over a thank you gift to the participants

6.2.4 Ask and Listen⁹⁰ (essential)

We want to understand a person's thoughts, emotions, and motivations, so that we can determine how to innovate for him or her. By understanding the choices that a person makes and the behaviors that a person shows, we can identify their needs and design for those needs. **No more than three people should attend any single interview** not to overwhelm the participant.

Assign the following **roles** so that each person has a clear purpose visible to the participant:

- one person to lead the interview
- a note taker
- a photographer (if the interviewee is ok with this)

Exercise: Experiment with your team first after your team has written the question guide; practice the individual interview by partnering in teams of two. One person plays

⁸⁹ Observation Field Guide p. 6/ SAP SE/ Sabrina Steinmetz 2014

⁹⁰ Observation Field Guide p. 7/ SAP SE/ Sabrina Steinmetz 2014

the role of the interviewer and the other the interviewee. Discuss and give feedback: Are there any topics or questions that are missing? Or alternatively you can do a trial run with one of the candidates on your interview list. This also helps to check whether you have too few or too many questions and to determine the time required for the interview.

6.2.4.1 Interview for Empathy⁹¹ (essential)

Talking with persons about their needs and observing them in their work/daily context helps to envision solutions that are desirable for them. Before an interview is conducted it should be carefully prepared. Using the right questions and interview approach determines if people will be open and share their experience. Ideally, the interviews are conducted at the person's regular environment.

Instruction: Plan and schedule the interview sessions with your team. Ideally, one interviewer and one note taker.

- Use the questionnaire you created
- The interviewer talks 20 % of the time, the interviewee 80%
- On site, start with an introduction and the goal of the interview.
- Ask for real examples, triggers, frequency, and occasions.
- Ask if you are allowed to take pictures, collect artifacts, and / or record the session.
- The interviewer leads the session, asks questions and guides the interviewee. He/she is responsible for the quality of the talk. He needs to keep eye contact, observe, and react flexibly, if needed.
- The note taker listens, observes, and captures the information and takes notes. The note taker can ask clarifying questions if the situation allows.
- End with a short debrief. Summarize what you learned and what surprised you the most and ask for feedback from the interviewee.
- Kindly thank the user for their time (a little gift for the user or their team is often appreciated).

In general: Don't suggest answers, don't be afraid of silence, don't ask binary questions, don't ask long questions, be aware of body language.

Purpose: For data collection during research and if users are available and directly accessible

What to use: Questionnaire, paper and pencil for note taker, camera or smart phone

Duration: 10 minutes per interview (minimum), can be much longer

⁹¹ Adapted from DT Method Cards SPM SI p 11 / SAP SE 2012

What do your students learn? They learn to listen, to collect information without criticizing it and to focus on the conversation without distractions.

6.2.5 Interview Behavior⁹² (essential)

Ask why, even when you think you know the answer, ask people why they do or say things. The answers will sometimes surprise you.

Never say “usually” when asking a question. Instead, ask about a specific instance or occurrence, such as “tell me about the last time you _____”

Encourage stories. Whether or not the stories people tell are true, they reveal how they think about the world. Ask questions that get people telling stories.

Look for inconsistencies. Sometimes what people say and what they do are different. These inconsistencies often hide interesting insights.

Pay attention to nonverbal clues. Be aware of body language and emotions.

Don't be afraid of silence. Interviewers often feel the need to ask another question when there is a pause. If you allow for silence, a person can reflect on what they've just said and may reveal something deeper.

Don't suggest answers to your questions. Even if they pause before answering, don't help them by suggesting an answer. This can unintentionally get people to things agree with your expectations.

Ask questions neutrally. „What do you think about buying gifts for your spouse?” is a better question than “Don't you think shopping is great?” because the first question doesn't imply that there is a right answer.

Don't ask binary questions. Binary questions can be answered in a word; instead you want to host a conversation built upon stories.

Don't correct people. Understand their perceptions and why they may perceive things differently than you. Remember: The participant is the expert!

⁹² Observation Field Guide p. 8/ SAP SE/ Sabrina Steinmetz 2014

6.2.6 Do an Observation⁹³ (optional, but if possible do it)

To gain a deeper understanding of target persons and stakeholder experiences you can do an observation. It helps you to tell an empathetic and relevant story later on and challenge your assumptions (in case you did assumptions in the Understand phase).

Instruction: During Your Observations, Look for:

- Personal details (age, gender, job, family size...)
- Direct, unfiltered quotes
- The expressions and feelings of the person, not just their words
- Ways they interacted with others and things in the environment
- Things they care about most
- Moments or things that triggered emotional responses, positive or negative

Purpose: Shift the perspective to be human centric

What to use: Pen and paper for note taker, camera, Questionnaire

Duration: Plan ½ to 1 day for the observation of the target personas in their environment

What do your students learn? They learn to study what a person does in their usual environment, to concentrate on this person for a longer time (longer than a few minutes) and to write down what they observed (hopefully precise and crisp).

6.2.7 Try and Do (optional, but if possible do it)

It is often very powerful to experience a process first-hand. Whenever possible, **put yourself in the shoes of a target person** and experience their activities directly. Putting yourself in someone's shoes enables you to get beyond what people say to what they think and feel.

We begin to take on the perspective of the person we create a solution for which enables us **to make decisions with their perspective in mind**. Of course, we always go back to see if we made the right choices and how we can improve the decisions we have taken.

Think of certain aspects of your experience you want to capture, such as:

- What emotions do you experience (surprises, frustrations, motivations, decision making factors) and why?
- What interactions do you have and how do they feel?
- What was your predominant feeling? Look for details you may have overlooked before. Consider the entire journey of your activity. Think about the actual start and end points of this experience.

⁹³ Observation Field Guide p. 9/ SAP SE/ Sabrina Steinmetz 2014

6.2.8 Document Research⁹⁴ (essential)

It is a good idea to **record the details of your research while they are still fresh**. When you step out of an observation or interview, it is easy to feel overwhelmed by the amount of information you have taken in.

Tip: Use the half hour immediately after the session to summarize what you have learned. It is important to capture the experience, **to bring it back** to the office, and to **share with team** members who were not present. Capture your observations in a notebook or on post-it. **Writing them on post-it will make it easier to reorganize them later**. Illustrate your thoughts with drawings.

You can capture your research results using the template for Interview summary.

After each interview the interview team should get together and share the information on post-its and hang them on the wall.

Empathy Mapping⁹⁵ (essential)

It can help tee up a discussion about the needs a user has. The discussion will be centered around what was observed, and what can be inferred about these target group persons' beliefs and emotions. The Empathy map helps to structure what you found out during the interviews or observations.

Instruction:

Identify the person the map is being created for

Label large areas around the person with:

“Thinking”: *What counts for the user? What is motivating the user?*

“Saying and Doing”: *With whom does the person interact? How does the person interact with others? What is the person actually doing?*

“Seeing”: *What can the person observe? What is visible / not visible to the person? How is the environment?*

“Feeling”: *What is frustrating? What are the worries and aspirations?*

“Hearing”: *What do the others say?*

“Pain”: *What are pain points? Is there a lack of efficiency? Why? Are there Obstacles? Why?*

⁹⁴ Observation Field Guide p. 11/ SAP SE/ Sabrina Steinmetz 2014

⁹⁵ Adapted from Gamestorming: A Playbook for Innovators, Rulebreakers and, Changemakers/Dave Gray 2010/ ISBN-13: 978-0596804176

“Gain”: *What are the goals of the person’s tasks? What are the needs of the person?*

Check if:

- Have the group describe from the point of view of the person what the person’s experience is in each section.
- Have the group synthesize what this person really wants, what are the forces motivating this person and what can we do for this person?

Purpose: Categorize insight from interviews and observation

What to use:

[Template Empathy Map](#), pens, interview and/or observation notes

Duration: 5 minutes per interview (e.g. between 20 minutes and 1 hour)

What do your students learn? Empathy for the situation of persons different from themselves

At the end of the research phase it make sense to **iterate the Stakeholder Map, the Empathy Map** and all other outcomes with your target audience. They give feedback if you understand them right and maybe they fill some information gaps you might have. It is also a very good opportunity to ask further questions and to get deeper information. After this iteration you are well prepared to go to the next phase.

6.2.9 Create a Story Board (optional, e.g. for a process)

Storyboards help to add real-world context. People, places and e.g. devices will be involved and it is easier to keep your mind on the flow. Based on the knowledge the Design Thinkers gained in the interviews they know enough about the scenarios of their target audience.

Instruction: Describe the scenarios of the target audience / target persons – but now with the new solution. Each team is handed a scenario with a **start frame** and an **end frame**. They need to fill in the gap with a story and explain how to arrive at the final frame.

Preparation of “Start & End” Storyboard:

Describe the PROBLEM (start frame):

I am trying to: _____ (users’ goal)

BUT _____ (users’ problem).



Purpose: You are working on a problem, or challenge and want to find out how to best get from where you are now (**start**) to your desired solution (**end**).

What to use: [Storyboard Template](#), pens, paper

Duration: 30 minutes

What do your students learn? To visualize a whole cycle of activities (scenario) of a target person.

All artifacts created in this phase are something the Design Thinking Team can iterate with the target persons to check if they understand them right. Very often, when such artifacts are shown, the target persons tell you additional facts and problems.

Troubleshooting:

Situation	Solution
First question of interview guide is a direct question for solving the challenge. ⁹⁶	<p>Explain that a good interview guide has the following structure:</p> <ul style="list-style-type: none"> • Easy questions to make your interviewee comfortable • Questions about the topic to set your interviewee in context • Questions that require creative answers to get some inspiration of what people want/ don't want
The team did not think about the user types ("I have three colleagues upstairs, which I will interview. I know them very well.") ⁹⁷ .	Explain that research is an explorative phase, where new perspectives and choices should be created. Therefore, make sure your teams embrace different user types (e.g. young and old people,..)
Team members are reluctant in doing interviews, as they do not like this kind of exercise. ⁹⁸	Make clear, that getting inspiration from users is a necessity and the mother of innovation (even if it might feel odd sometimes).

⁹⁶ DT presentation provided by Thomas Eckert, SAP SE 2015

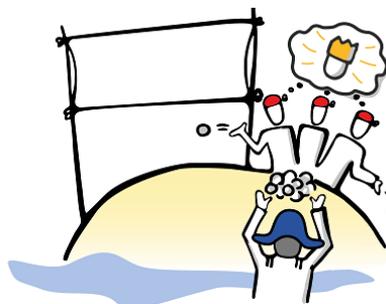
⁹⁷ DT presentation provided by Thomas Eckert, SAP SE 2015

⁹⁸ DT presentation provided by Thomas Eckert, SAP SE 2015



Team members won't take notes

State clearly that without notes, they will have no input for the next phases. Motivate them to write just down what they hear without thinking about it.



6.3 Synthesize and Point of View

Synthesis is about **structuring the unstructured Data**. The goal is to share and structure the information collected during the 360° Research phase. Additionally it is about setting the information in relation to different stakeholder types, those might be personas. Different techniques help to come to a convergent state of mind without jumping to the solution just yet.

Activities:

- Share raw data by storytelling
- Look for patterns and themes
- Saturate and Group
- Cluster results
- Derive insights
- Use your persona and create scenarios
- Create Point of View and 'How might we help...' question

Recommended Energizer Games for Synthesis:

- [Danish Clapping](#) (especially after lunch break)
- [The sun shines on](#)⁹⁹
- [Group Statues](#)¹⁰⁰
- [Fruit Salad](#)¹⁰¹
- [I'm going on a trip](#)¹⁰²

⁹⁹ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=ria&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHMP6ZQhcQw&bvm=bv.96339352.d.bGQ

¹⁰⁰ dito

¹⁰¹ dito

¹⁰² dito

Outcome of the Synthesis Phase:

- Clustered insights (patterns, themes)
- Persona
- Point of view
- How might we help...? Question

Methods to use in the Synthesize phase:

6.3.1 Do Storytelling¹⁰³ (essential)

The goal of storytelling sessions is to get the team on the same level of knowledge about the research findings. All team members should participate in the user research and the storytelling. The storytelling includes research findings, rich background information, and the research approach. During the session, team members take turns in sharing their stories of the research.

Instruction: Prepare the research findings before the storytelling activity. Outline the research approach, methods, and circumstances at the beginning of the session to summarize the effort.

Tell the story and characteristics of your first interviewee. Read your post-it to the audience and stick them to the wall. **Images, movies, anecdotes, and quotes** are useful to support your story and engage the audience. Encourage the audience to ask questions. Hand over to the next storytelling. **Share all research stories in one meeting** to achieve a broad overview. By doing storytelling:

- The note taker tells the story and the interviewer complements if necessary
- Be short and precise
- Walk in the shoes of the user
- Be visual
- Use images and examples
- One conversation at a time
- Defer judgment
- Provide a broad overview

The rest of the team who follow the storytelling will try to find patterns (what a lot of persons said), pain points and unexpected statements while they are writing on post-it what they hear.

Purpose: To get the team on the same level of knowledge about the research findings.

¹⁰³ Adapted from DT Method Cards SPM SI p 13 / SAP SE 2012

What to use: Interview or observation notes taken; post-it, pen -> Use color coding (one color for each person)

Duration: 5 minutes for each story

What do your students learn? They learn to focus on the important outcomes and to summarize the findings for a short time slot. And they learn to find patterns.

6.3.2 Saturate and Group¹⁰⁴ (optional)

First saturate the space around you with all the findings. In other words stick photos, artefacts, and other collected objects around you. This will help to unpack thoughts and experiences into tangible and visual pieces of information. The surrounding information will inform and inspire the team. Afterwards **group these findings** to explore, which **themes and patterns** emerge. This will inspire the team to move toward identifying meaningful needs of people and insights.

Instruction:

- Saturate your wall space (or work boards) with post-it headlining interesting findings plus pictures from the field of users you met and relevant products and situations.
- In order to begin to synthesize the information, organize the post-it and pictures into groups of related parts. You likely have some ideas of the patterns within the data from the unpacking you did when producing the notes.
- The end goal is to synthesize data into interesting findings and create insights which will be useful for creating respective solutions.

It is common to do the grouping with post-it **headlining interesting stories** from field work. But grouping is also useful in terms of thinking about similarities among a group of products, objects, or persons.

Purpose: Structuring of findings

What to use: post-it, pens, white boards or flip charts

Duration: 30 minutes + - depends on the data collected, interviews taken

What do your students learn? Structuring of information by identifying patterns and themes

¹⁰⁴ Adapted from DT Method Cards SPM SI p 15 / SAP SE 2012

6.3.3 Clustering (essential)

Clustering is a further step after transferring the research findings to post-it and sharing the stories with the team. **During this activity, the team revisits all findings and sorts them in new clusters.** This activity will help the team in making sense of a large amount of information.

Instruction:

- Look at the research findings written on the post-it (across all research activities) and group similar statements into clusters.
- Label the clusters (e.g. "pain points, "feelings towards security", tools used).
- If a cluster is getting large, try to break it into sub-clusters.
- Review your clusters and identify themes.
- Potentially re-cluster.
- If a post-it belongs in more than one group copy it and place it in both groups.
- Avoid too many discussions during clustering or even cluster in silence! All team members should participate.
- As a team discuss the themes and identify relationships. This might lead to meta-patterns, emerging trends, or opportunities. Discuss the impact of the themes on the target person(s).

Purpose: The goal of this activity is to get a visual overview across all research findings and to identify all relevant themes.

What to use: post-it, pens, whiteboard or flipchart

Duration: 20 minutes

What do your students learn? Structuring of information and building of clusters

6.3.4 Create a Persona¹⁰⁵ (essential)

A persona is a **representative target person** that enables creative teams to develop shared understanding and empathy. When you create the solution **always have this persona in mind** – imagine this persona is sitting in front of you, excited what you will do for him or her.

Instruction: Identify a type of person who is important in the problem you are exploring. Choose a specific person to represent that group (think about persons you have interviewed – try to create an average character).

Create a picture of this person (a sketch), put the **persona's specifics** - name, age, gender, family situation into the background field. Describe the job title and

¹⁰⁵ Adapted from Gamestorming: A Playbook for Innovators, Rulebreakers and, Changemakers/Dave Gray 2010/ ISBN-13: 978-0596804176

responsibilities in the field 'key responsibilities'. Edit the **main goal** as well as the **competencies** in the suitable fields. In the 'thoughts' section put the internal feelings of the person, desires, mindset etc. Formulate the **needs and pain points** and add them into the section on the right hand side. Use the last field for the stakeholders (if this information is available).

Use the **persona** and **his/her context to discuss your ideas** in the ideation phase as well as in the implementation phase.

Make sure you call your persona by name! E.g. "What would [Name] do? How would this make [Name] feel?"

Purpose: Create a focus on the humans at the core of the problem or situation. Help teams develop empathy and a shared understanding of the target person

What to use: [Template Persona Description](#), pens, interview and/or observation notes

Duration: 5 – 20 minutes

What do your students learn? Empathy and a focus on the human side of the problem, people context for discussion.

6.3.5 Create Point of View¹⁰⁶ (essential)

The point-of-view is one sentence that creates an image in your mind. Based on an understanding of a target group and insights into a specific need, it narrows down the problem space and focuses on a specific problem. The Point of View describes what the persona expects.

Instruction: Formulate the Point of view by using the persona, his/her needs and add insights. Write it down starting with

'I, as <persona name>...need....because I want to.....(insight)'

Purpose: To understand target person expectations

What to use: [Point of View Template](#)

Duration: 10 minutes

What do your students learn? To understand needs and insights and to step into the shoes of another person – to see the world from another slant.

¹⁰⁶ Adapted from Gamestorming: A Playbook for Innovators, Rulebreakers and, Changemakers/Dave Gray 2010/ **ISBN-13:** 978-0596804176

6.3.6 Create “How might we help...”¹⁰⁷ Question (essential)

Based on the Point of View of our persona we create a “How might we help...” question to concentrate again on the goal and needs we found out.

Instruction: Think of questions that start with

“How might we help <persona> to...<goal> while <current pain point>.....?”

In order to expand the group’s thinking on the problem area and create a framing question.

- Title a sheet of paper “How Might We”
- Discuss the problem area and the difficulties that are faced.
- For each difficulty, think of a “How might we..?” question that could overcome the problem. E.g. we don’t have enough money could turn into “How might we get more money?” and/or “How might we do it with less money?”
- Write and post every “How Might we..?” question, no matter how strange or silly. Try to get them in the sweet spot between too narrow “HMW decrease distribution costs to small vendors in non-urban markets?” And too broad, “HMW double our distribution?” Focusing on people often helps: “HMW build better relationships with distributors?”
- Once the group has slowed down, have everyone categorize the HMW questions by moving the stickies into groups. Name the groups and discuss priorities.
- Use discussion (or a fast method like Dot Voting) to narrow down the questions and choose one.

Purpose: To frame and find the real problem

What to use: [How might we help Template](#), pens, Point of View

Duration: 10 minutes

What do your students learn? To create a framing question and to focus on a person’s goals.

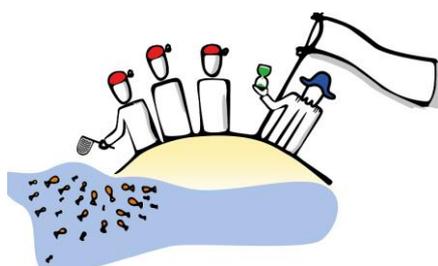
Synthesis is the hardest part of the Design Thinking process. The workshop participants are very often overwhelmed by the input they got. The Clustering and structuring can be rather exhausting. And the team mood goes down. As a coach you need to support the team to go through this phase and to motivate the team(s) to **do iterations with the Point of View and the ‘How might we help’ question**, even if the people are afraid to again get feedback.

But the good news: Ideation is more enjoyable and the “How might we help...” question is the starting point for the ideation.

¹⁰⁷ Source: Adapted from Stanford d.school’s Bootcamp Bootleg and many others

Troubleshooting:

Situation	Solution
Team is in an emotional valley and is questioning everything about the workshop. ¹⁰⁸	Explain that this is a typical phenomenon, but it is worth to overcome this valley of uncertainty. To be creative, context is required and synthesis is a key step to create inspiring context.
Team is questioning how synthesis exercises are related to previous exercises. ¹⁰⁹	Explain that Design Thinking is not an $a + b = c$ approach. Trials and iterations are part of it and in many cases, the value of an exercise gets obvious at a later stage.
Team is extremely slow in creating e.g. a persona or choosing the framework to work with. ¹¹⁰	Make it clear for the team that it is not required to start perfectly. Just start! Step in if participants get stuck in a detailed discussion and/or one participant takes too much time to share her/his thoughts.
Team become goofy and silly ¹¹¹	This will happen and is O.K to a point. Try to focus them back on topic – a good pressure point is to mention the presentation at the end
Team members do something that is totally contrary to what you recommended, e.g. does not do Storytelling but interpret what they've observed ¹¹²	It is O.K: to tell them: "I observed that you used/did... Which may color/distort the results because.../We found what typically works well is..."



6.4 Ideate

Ideation is about brainstorming ideas. The goal is to generate as many ideas as possible. Use the "How might we help" questions (and maybe also some ideas from

¹⁰⁸ DT presentation provided by Thomas Eckert, SAP SE 2015

¹⁰⁹ DT presentation provided by Thomas Eckert, SAP SE 2015

¹¹⁰ DT presentation provided by Thomas Eckert, SAP SE 2015

¹¹¹ Tips & Tricks for DT Coaches Version 2.0, Martina Schuh/Claudia Diesner, SAP SE 2013

¹¹² Tips & Tricks for DT Coaches Version 2.0, Martina Schuh/Claudia Diesner, SAP SE 2013

the CFB Method, from the 'Future' column) and do an ideation round for each 'How might we help' question.

At this point the team starts to imagine possibilities. Do not check for feasibility and viability at the beginning of ideation, this is done later during prioritization.

Activities:

- Prepare space
- Apply ideation tools & generate ideas
- Move from problem to solution space
- Prioritize and filter ideas using dot voting
- Develop first design concepts

Recommended Energizer Games for Ideation:

- [What if?](#)¹¹³
- [Word Chain](#)¹¹⁴
- [I am a tree](#)¹¹⁵
- [Clap exchange](#)¹¹⁶

Outcome of the Ideation phase:

- Sketched ideas for a prototype

Methods to use in the Ideation Phase:

6.4.1 Use Brainstorming to create Ideas (essential)

6.4.1.1 Silent Brainstorming

Silent Brainstorming gives **shy team members** the **chance to speak out** and is a good method to prevent alpha leaders to speak too much.

Instruction:

¹¹³ SAP SE DT Jam page / Games / 2014

¹¹⁴ dito

¹¹⁵ dito

¹¹⁶ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHMP6ZQhcQw&bvm=bv.96339352.d.bGQ



- All team members get post-it to write down their solution ideas for the ‘How might we help...’ question (start with the first question and collect ideas, continue with the next question and so on,...).
- Give the team 5 minutes to write down their ideas and then let each of the team members stick their post-it on a brown paper or a whiteboard or a flipchart by introducing and explaining what is written on the post-it in 30 seconds.
- At the end of this brainstorming round the team clusters the ideas for each ‘How might we’ question.

Tip: Dot Voting can be used, if enough solution ideas are created – to enable the team to decide for which idea(s) they would like to create a prototype.

Tip: Let the team vote on one realistic / pragmatic idea and additionally on one wild idea to have some influence on the prototype.

Purpose: To create as many ideas as possible (“go for quantity”)

What to use: post-it, pens, brown paper or whiteboard or flipchart, Time Timer

Duration: between 30 – 40 minutes (depending on the number of ideas and team members).

What do your students learn: They learn to create ideas by focusing on a specific topic

6.4.1.2 Relaxed Brainstorming

Relaxed Brainstorming helps if the **team is tired or inactive** and they are not able to come up with new ideas. The aim of this method is to take one’s mind off things for a short time.

Instruction:

- Give each team member a balloon and let them inflate it (alternatively blow bubbles).
- Then let them play with the balloons for 1-3 minutes without thinking about the problem.
- Just playing and looking what comes to mind. The team members need to say what comes into their mind, the coach writes the ideas on the whiteboard or flipchart.

Purpose: To support the team in a “phase of fatigue” to create more ideas

What to use: Balloons or blow bubbles, Whiteboard, Whiteboard marker

Duration: 5 minutes

What do your students learn: Another brainstorming method



6.4.2 Use 6-3-5 Method to build on the ideas of others (optional)

The 6-3-5 method is a way that **everyone can brainstorm without talking over one another**. Actually, there is no talking at all — only writing!

Instruction:

- With 6 people per group, each person writes down 3 ideas on one large sheet of paper within 5 minutes (hence the name 6-3-5).
- After 5 minutes, everyone passes their paper to the next team member.
- Everyone then reads the ideas on the piece of paper they just received and adds 3 new ideas to the list. This pattern continues until the lists make their way back to the person who started them.

Tip: You can use this method also with less or more than 6 people

Purpose: This way, everyone can build on the ideas of others without interruptions!

What to use: [6-3-5 Template](#), pens

Duration: You need 30 minutes for this exercise with 6 people (more or less with a bigger or smaller group)

What do your students learn? Your students learn to create a lot of ideas in a very short time.

6.4.3 Dreamer/Realistic/Critical (leverage with Superhero, Politician.../optional)

If you have a **short time** to go through a full idea generation exploration-evaluation cycle this method helps you to create ideas in a short time.

Instruction: As the dreamer, imagine that you could ask a genius to solve your problem. What would you wish for? Select a wish and play the realist to work it into a practical idea. Then put on the hat of the critic, to poke holes in the idea.

- Be the **dreamer**: What would you ask a genie for in order to solve your problem? List at least 3-5 wishes, especially things not normally possible. Try to make each wish more improbable than the last.
- Select one of the wishes.
- Be the **realist**: Extract some of the features, aspects or principles of the wish
- Take one aspect and engineer it into a practical idea.
- Be the **critic**: Poke holes in the idea. Why won't it work? What are the obstacles?
- How might they be overcome?
- Go back to being the realist and engineer another aspect of the wish, then play the critic again.



- When you feel that the ideas have been exhausted, then move on to the other wishes.

Purpose: You want to use a mainly discussion-based method, and to create expansive ideas, practical ideas and evaluation, all in one tool

What to use: Whiteboard or Flipchart, post-it, pens

Duration: 40 – 70 minutes

What do your students learn? They learn to change their perspectives and to think more holistically.

Walt Disney used to use this to work through his ideas. In the end, he would often choose the idea that has the least insurmountable problems.

6.4.4 Facts / Lies (optional)

With this method you **enable** the Design Thinking Team in **expansion of thinking** about what's possible. Many "blue ocean"-style imaginative ideas arise.

Instruction: Explore the core of a situation, and understand how your perceptions and assumptions influence your ideas about it.

- Draw 4 columns on a large area of paper. Label them: Facts, Lies, Consequences and What If?
- Start in the Facts column: list the things you know about the situation or problem. What does the target audience do? What do other persons do? What is common knowledge? E.g. "students don't like to learn vocabulary".
- Next to every Fact, put up at least one corresponding lie that reverses the fact. E.g. "students love to learn vocabulary"
- Next to every lie, put up the consequences. What would happen if the lie was true? E.g. "There would be better test results."
- During the process, use "What if?" to spark ideas (inspired by the lies or consequences) that everyone posts in the fourth column, e.g. "What if we turn the learning process into a joyful experience?"

Purpose: To challenge and break current assumptions

What to use: [Template Facts & Lies](#), post-it, pens

Duration: 10 – 30 minutes

What do your students learn? They learn to explore truly new territory and to generate new ideas in old, well understood fields as well as an expansion of thinking about what's possible.



6.4.5 Solution Distortion (optional but very helpful to create wild ideas)

If the Design Thinking team gets stuck this method brings a little lightness to the room. You can also use it to rapidly create ideas.

Instruction: Come up with only silly, outrageous and impractical solutions. Weed out anything sensible. Modify each silly suggestion to make it more attractive or practical without losing the spark.

- State the problem area (e.g. ‘How might we help?...question), and write it up where everyone can see it.
- Spend just 5 minutes coming up with only totally silly, outrageous and impractical solutions.
- As you go, ruthlessly weed out anything practical or sensible.
- Take each silly suggestion and see how you can modify it to make it more attractive or practical

Without losing the spark and watering it down too much.

Optional: Can be played as a game with one team suggesting the wild ideas and the other team. Making them practical (use an impartial judge).

Purpose: Break up people’s current views, rapid idea generation

What to use: whiteboard or flipchart, post-it, pens

Duration: 5 -20 minutes (depends on how many “How might we help...?” questions the team works)

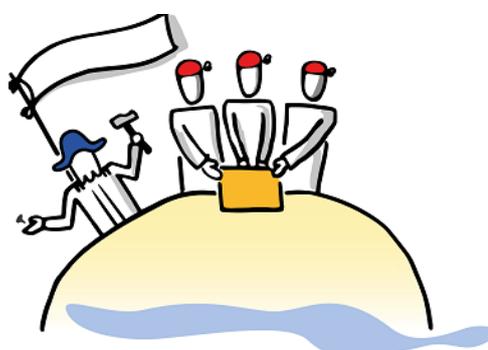
What do your students learn? They learn to think differently and that it is o.k. to have ‘silly’/ crazy ideas

For the prioritization of ideas you can work with [Dot Voting](#). At the end of this phase the Design Thinking team needs to decide which idea they would like to follow – for which they want to create a prototype and which ideas they left behind.

Troubleshooting:

Situation	Solution
The team has started brainstorming, but does not generate sufficient ideas or only no-brainers.	Care about good questions to deal with. A good set of questions will inspire good ideation. Ideation is exhausting. Care about the energy level in the team. If the team is struggling with creating ideas, push them and use techniques like “What would Superman do...” Encourage wild ideas.

<p>The team has started brainstorming, but ideas do not really address the challenge.</p>	<p>Remind the team, of what their challenge is and what they “get paid for”, if they ideate outside the scope. Put the Persona and the challenge visible into their workspace.</p>
<p>The team has done brainstorming, but finally cannot agree on top 3 ideas.</p>	<p>Use voting techniques for prioritization or “How would you spend 100 €?” question.</p>



6.5 Prototype

Prototyping is the first step to actually develop an idea. The goal is to develop quick prototypes in order to create a first user experience of how the idea might feel, look like and work. Avoid creating ‘perfect’ prototypes – an imperfect or low fidelity one will work better and it is easier to improve such a low cost prototype. The prototype that the team develops, depends on the ideas the team came up with (e.g. for a process a role play or a storyboard can be useful)

Activities: Choose the prototype which will be best to explain your solution

- Do paper prototyping or
- Create an technical prototype or
- Create solution models or
- Sketch solution and scenarios (Storyboard, Process Model) or
- Show your solution idea in a Role Play

Recommended Energizer Games for Ideation:

- [Human Car](#)¹¹⁷
- [Spaghetti Tower](#)¹¹⁸

¹¹⁷ SAP SE DT Jam page / Games / 2014

¹¹⁸ SAP SE DT Jam page / Games / 2014

- [Paper Airplane contest](#)¹¹⁹
- [Knees up](#)¹²⁰

Outcome of this Phase:

- One (or more) prototype(s)

Methods to use in the Prototyping Phase

6.5.1 Do Paper Prototyping (Mock-up)

A good way to show a solution to the problem is by using a paper prototype (also called a mock-up) It is useful to use paper prototyping **to explore an interface, a process flow**, an experience, etc.

Instruction:

- Clearly post the idea(s) for exploration.
- Spread out lots of different sizes and colors of paper.
- Work in small groups of 2-3 people to create a version of the idea with the paper.
- If the groups are looking at the same idea, it can be interesting to ask each group to approach it from a different priority, or from a target person's / stakeholder's point of view.
- As you go, make sure that your prototype is "functional" and shows the changes over time. Post-it are especially good for this, as they are pre-glued and can be easily moved to show changes in a process or interface.
- Each group will present to everyone else at the end. Make sure they actually show the experience of the idea as well as explaining it. Be sure to plan time for this!
- Document these presentations! Video is a great tool for this. Make sure to keep close-up photos of the prototypes as well.

Purpose: Makes a solution idea tangible

¹¹⁹ SAP SE DT Jam page / Games / 2014

¹²⁰ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHmp6ZQhcQw&bvm=bv.96339352.d.bGQ

What to use: paper in different colors, foils, pens, scissors and glue

Duration: 20 – 45 minutes

What do your students learn? They learn to create a visual mock-up to explain their solution idea or concept – to support deeper exploration of the value of the ideas, and a first step towards creating requirements. [Note: The reasoning behind a feature is more important than the exact form it takes.]

6.5.2 Create Solution Models

Another possibility to explore ideas is the usage of solution models. **Making models in physical space leads to deeper understanding.** It is very helpful to use physical prototyping to explore a user experience, a process flow, a roadmap, etc.

Instruction:

- Clearly post the idea(s) for exploration.
- Spread out lots of materials on the table. The more wacky, the better, because unusual materials trigger new ideas.
- Work in small groups of 2-3 people to create a version of the idea with the materials.
- Encourage the group to let the materials and the physical relationships inspire the direction of your idea. What's possible?
- If the groups are looking at the same idea, it can be interesting to ask each group to approach it from a different priority, or from a different target person / stakeholder's point of view.
- Each group will present to everyone else at the end. Make sure they actually show the experience of the idea as well as explaining it. Be sure to plan time for this!
- Document these presentations! Video is a great tool for this. Make sure to keep close-up photos of the prototypes as well.

Purpose: To provide a tangible representation of the idea(s)

What to use: craft stuff ([as described in 3.2](#)) like foam, string, Popsicle sticks, play-dough, small balls, pipe cleaners, etc. also scissors and glue.

Duration: 20 – 45 minutes

What do your students learn? They learn to create tangible model to explain their solution idea or concept. Use it as a creative iteration object on the ideas and a deeper exploration of their value. [Note: Don't let the absurdity of this process stop you from valuing its deep insights. Sometimes people need to get absurd to be truly innovative.]



6.5.3 Role Play

Another kind of prototype is a role play. It's ideal to show a solution for a process or a situation where a mock-up or a model makes no sense. The Design Thinking team acts out the story of people engaging in an experience. This can also be used in the Understand Phase – to gain better understanding of the problem.

Instruction: Rather than talking about the experience, pretend to be the people involved, and perform it.

- Clearly post the idea(s) for exploration.
- Divide into groups of 2 or 3. Each group will act out the story of an experience by pretending to be the people involved.
- If the groups are all exploring the same idea, ask each group to approach it from a different perspective, or from a different target person / stakeholder's point of view.
- Create the environment with what you have: use tables to create the space; use paper sketches for props; or mime anything extra.
- Each group will perform for everyone at the end. Make sure they actually show the experience of the idea instead of just explaining it. Be sure to plan time for this!
- Use video and photos to document the presentations. Make sure to keep close-up photos of any artifacts that are created.

Purpose: To tell a story of how ideas will impact the lives of people

What to use: Maybe some clothes to get dressed up in, paper and pens to write notes about the story

Duration: 20 – 30 minutes (to prepare the role play, the role-play duration is no longer than 3 minutes)

What do your students learn? An exploration and deeper understanding of the human side of the process. An understanding of the human experience.

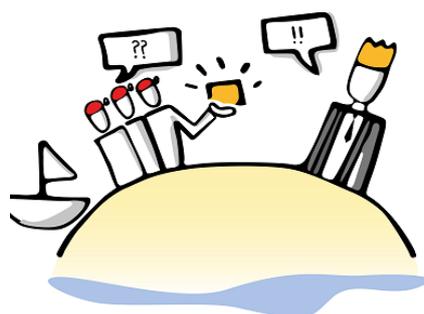
Tips for the coach:

Situation	Solution
The team does not start to work. There are only discussions, how to move forward. ¹²¹	Observe carefully during the first eight minutes: Do teams start discussing ➡ o.k. Do teams gather material ➡ o.k. Do teams start emailing ➡ Alert After 5 minutes the teams should start building
Some team members start to do mails. ¹²²	Remind the rules of engagement. Be in or out!

¹²¹ DT presentation provided by Thomas Eckert, SAP SE 2015

¹²² DT presentation provided by Thomas Eckert, SAP SE 2015

The team gets lost in details. ¹²³	Explain that showing the customer experience of your solution is more important than 'polished metal'.
The team is creating just power point like drawings. ¹²⁴	Request something in 3D from the team.



6.6 Test

To **avoid wasting time** with ideas that won't work **start very early with testing** to validate your prototype.

Testing is about grounding the feasibility of ideas **with the target persons** and stakeholders. At this point it is about gathering feedback on concepts and prototypes so that only the best ideas and concepts get implemented. Make sure the presentation is full of emotion in order to check on feasibility, viability and desirability with the target persons and stakeholders.

Don't fight for your prototype. Feedback is just Feedback – do not justify – listen and ensure that a note taker will write down what your target audience say.

Apply activities, tools and techniques from the previous phases to iterate if necessary.

After certain iterations implement your solution and observe how people will use it.

Activities:

- Plan and conduct validation sessions
- Check on feasibility, viability and desirability
- Capture feedback

¹²³ DT presentation provided by Thomas Eckert, SAP SE 2015

¹²⁴ DT presentation provided by Thomas Eckert, SAP SE 2015

- Incorporate feedback and iterate prototype

Techniques:

Capture feedback:¹²⁵

- Let the prototype do the talking.
- Don't defend your idea (it is for the user, not for you).
- Be aware what you want to know – stay on topic.
- Be open for new ideas and insights.
- Be receptive and thankful for your users feedback – your aim is to learn.

And go back to Synthesis and/or Ideation.

Recommended Energizers for Testing:

- [Balloon Tower Contest](#)¹²⁶
- [Countdown](#)¹²⁷

Outcome:

- Structured validation feedback
- Improved prototypes

Methods do use during Testing:

7.6.1. Interview for Empathy (as described in section 7.2.4.1)

7.6.2. Five Why? Questions

Instruction

Decide how to collect feedback for the prototype:

¹²⁵ DT presentation provided by Thomas Eckert, SAP SE 2015

¹²⁶ SAP SE DT Jam page / Games / 2014

¹²⁷ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKVc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHMP6ZQhcQw&bvm=bv.96339352.d.bGQ



- Who will present the prototype?
- Who will do an observation?
- Who will take notes?
- Can the prototype be tested? If so how is the testing and the observation organized?
- When the team presents the prototype to a target person (tester) they should ask questions to find out if the solution idea will
 - be understood
 - fit the target person's needs

Very often a tester's answers that they think the solution (idea) is nice or super or that they like it (they want to be polite) – in this case it is very important to ask: Why?

The team should do this up to five times to find out what the testers like in detail.

The same is true when a tester dislikes the solution idea. The team should also ask 5 times: Why?

And it is also important that the note takers do their job properly and collect all what they hear.

Purpose:

Validation of the solution (idea) and testing of the prototype.

What to use: Prototype, pens, note pads, camera

Duration: 1 hour or more

What do your students learn? They learn that a solution can fail, to release some ideas (that is the hardest thing to learn – to leave a won idea behind) and to improve the prototype.

Troubleshooting:

Situation	Solution
The Team is too shy to present the prototype	Remind them that the prototype does not need to be perfect, that it is o.k. if they'll fail and that the gathered feedback will improve the solution.
The Team justifies the prototype	Remind them that feedback is just feedback and that they should be grateful about it.

After the Testing phase the Design Thinking process is done. If possible implement the solution created.

7. Appendix

7.1 Additional Information for Chapter 1

7.1.1 Eight Principles for a Great Design Thinking Workshop¹²⁸

There are some principles for a great Design Thinking workshop supporting creative work:

- **SHOW DON'T TELL**¹²⁹: Communicate your vision in an impactful and meaningful way by creating experiences, using illustrative visuals, and telling good stories.
- **FOCUS ON HUMAN VALUES**¹³⁰: Empathy for the people you are designing for and feedback from these users is fundamental to good design.
- **CRAFT CLARITY**¹³¹: Produce a coherent vision out of messy problems. Frame it in a way to inspire others and to fuel ideation
- **SUPPORT ITERATION**: Motivate the team to iterate each workshop result (understanding result, process description, persona(s), point of view, mock-ups, story boards,...) during the design thinking phases – each early feedback will ensure that the team is on the right track.
- **EMBRACE EXPERIMENTATION**¹³²: Prototyping is not simply a way to validate your idea; it is an integral part of your innovation process. We build to think and learn.
- **BE MINDFUL OF PROCESS**¹³³: Know where you are in the design process, what methods to use in that stage, and what your goals are.
- **BIAS TOWARD ACTION**¹³⁴: Design thinking is a misnomer; it is more about doing than thinking. Bias toward doing and making over thinking and meeting.
- **RADICAL COLLABORATION**¹³⁵: Bring together participants with varied backgrounds and viewpoints. Enable breakthrough insights and solutions to emerge from the diversity.

¹²⁸ Stanford University, d.school / bootcamp bottlenegg / p 3 /available online:

<http://dschool.stanford.edu/wp-content/uploads/2013/10/METHODCARDS-v3-slim.pdf>

¹²⁹ Stanford University, d.school / bootcamp bottlenegg / p 3

¹³⁰ Stanford University, d.school / bootcamp bottlenegg / p 3

¹³¹ Stanford University, d.school / bootcamp bottlenegg / p 3

¹³² Stanford University, d.school / bootcamp bottlenegg / p 3

¹³³ Stanford University, d.school / bootcamp bottlenegg / p 3

¹³⁴ Stanford University, d.school / bootcamp bottlenegg / p 3

¹³⁵ Stanford University, d.school / bootcamp bottlenegg / p 3



7.2 If you only remember a few things...¹³⁶

You are a design thinker:

- Become more intentional about your design thinking process.
- Be confident in your creative abilities.
- Be strategic about what needs attention first.
- Listen to your stakeholders and be inspired to design a solution for them.
- It's your opportunity, and your responsibility, to have an impact on the lives of your students and be part of changing and growing the system.

Embrace your beginner's mind:

- Approach problems as a novice even if you already know a lot about them.
- Let yourself learn.
- Be willing to experiment.
- Be ok with not having the "right" answer. Trust that you'll find one.

Stepping out of your zone of comfort = learning:

- Get unstuck.
- Break your routine.
- Use the world outside your classroom to invigorate your work.
- Analogous inspiration is your best friend.
- Leave your classroom.
- Collaborate with others.

Problems are just opportunities for design in disguise:

- Have an abundance mentality.
- Be optimistic.
- Believe the future will be better.
- Start with, "What if?" instead of "What's wrong?"

7.3 Further Information for Chapter 6

¹³⁶¹³⁶ Design Thinking for Educators 2015/ / available online: <http://www.designthinkingforeducators.com/toolkit/>

7.3.1 Understand – further Methods

7.3.2 Charretting¹³⁷

Instruction:

- Write the design challenge on a whiteboard and paint a table with three columns.
- Brainstorm relevant user/context and pick the most important user (column one).
- Brainstorm about potential issues/insights you can learn from the user. Pick one issue/insight (column two).
- Brainstorm potential solutions based on the insights to solve the issue (column three).
- Ask yourself: What did we discover? What are the most important insights? Potentially rephrase the challenge.
- Potentially iterate on other user/context.
- Facilitation needed if: The team has difficulties in rephrasing a challenge.

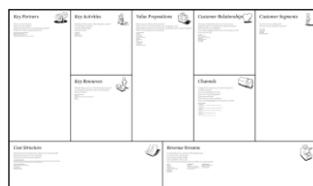
Purpose: Helps project teams to gain clarity about the challenge and find out how much the team knows already about the topic. Can also be used to discuss scope with project sponsor, if scope is fuzzy.

What to use: Charetting Template

Duration: Thirty minutes to one hour

What do your students learn? Your students learn how to gain clarity about the challenge and find out how much they knows already about the topic.

7.3.3 Business Model Canvas¹³⁸



Instruction:

Use the guidelines provided in the canvas to generate to visual representation & collaborative, common understanding of the customer's businesses model including:

¹³⁷ DT Method Cards SPM SI, SAP SE 2013 Origin: French *charrette* cart (used to transport drawings), from Old French, cart, from *char* wheeled vehicle + *-ette* — more at [chariot](#) adapted by [d.school@Stanford](#) and many others;

¹³⁸ Business Model Generation, Alexander Osterwalder, 2011 **ISBN-13:** 978-3593394749

- Customer Segments (for whom are we creating value?)
- Customer Relationships (What type of relationship do we establish to meet the expectations of our customers?)
- Value Propositions (Which of our target group's problems are we helping to solve?)
- Channels (How are we reaching our target group?)
- Revenue Streams (For what value are our customers willing to pay?)
- Key Activities (Which key activities do our value proposition require?)
- Key Resources (What key resources do our value proposition require?)
- Key Partners (Who are our key partners? Who are our Key suppliers?)
- Cost Structure (Which key activities, resources are most expensive?)

Tip: Start with customer segments and move from right to left through the canvas

Tip: This could also be completed collaboratively with the customer

Tip: Can also turn these into questions during discovery

Reference: www.businessmodelgeneration.com

Purpose:

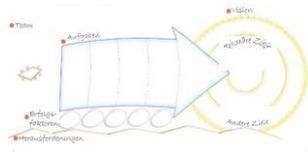
Get a deeper understanding of customers/target group using a guided map that explores all areas of an organization.

What to use: [Business Model Canvas Template](#), pens, post-it

Duration: 45 – 60 minutes

What do your students learn? They learn what is important for any business – a holistic view on key activities of an organization.

7.3.3.1 Gameplan



Instruction:

The Gameplan is an DT team internal project plan (useful if the DT phase is longer than 2 days). It makes the team activities transparent and can be used for alignments.

- Define the team



- List all tasks and activities
- Create a team vision
- Define primary targets and if necessary additional targets
- Think about and write down your success factors
- Describe your challenges

Purpose:

To create a common understanding in the team about the next steps and challenges.

What to use: Game Plan Template, pens, post-it

Duration: 45 – 60 minutes

What do your students learn? To create a plan, a vision and targets – to plan a project in a structured way.

7.4 Understand: Energizer Games

7.4.1 Scissors, Paper, Rock¹³⁹:

Rules:

- Rock breaks scissors --> Rock wins!
- Scissors cut paper --> Scissors win!
- Paper covers rock --> Paper wins!
- If both players do the same gesture,

quickly repeat.

1. Round:

Find a partner and play against this colleague.

2. Round:

The winner of the first round looks for another winner and repeats the game. The “losers” become the biggest fans of their winners and cheer for them. Play until final winner is determined.

7.4.2 Howdy Howdy¹⁴⁰:

- Participants stand in a circle.

¹³⁹ SAP SE DT Jam page / Games / 2014

¹⁴⁰ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

- One person walks around the outside of the circle and taps someone on the shoulder.
- That person walks the opposite way around the circle, until the two people meet.
- They greet each other three times by name, in their own language.
- The two people then race back, continuing in opposite directions around the circle, to take the empty place.
- Whoever loses walks around the outside of the circle again and the game continues until everyone has had a turn.

7.4.3 Juggling ball game¹⁴¹:

- Everyone stands in a close circle. (If the group is very large, it may be necessary to split the group into two circles.)
- The facilitator starts by throwing the ball to someone in the circle, saying their name as they throw it.
- Continue catching and throwing the ball establishing a pattern for the group. (Each person must remember who they receive the ball from and who they have thrown it to.)
- Once everyone has received the ball and a pattern is established, introduce one or two more balls, so that there are always several balls being thrown at the same time, following the set pattern.

7.5 Research: Energizer Games

7.5.1 Alter Ego¹⁴²

- Group is divided into teams of 4-6 participants.
- The teams stand in a circle and get a picture.
- Each team is asked to tell a story related to the picture they got. The speaker should always take the perspective of one person in the picture.
- The first person chooses a character and starts with “I am ...” and tells the first 1 or 2 sentences of a story. For example: “I am Susan. I am sitting in a meeting with two of my colleagues. I really hate it, when they stand behind me staring at my screen.”
- The next person takes over, either as the same character or another one and continues the story with “I am...” and 1 or 2 more sentences of the story. For example: “I am Brian, and currently I have to wait until Susan finishes the update. I really don’t like that I am so dependent of her”.

¹⁴¹ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

¹⁴² SAP SE DT Jam page / Games / 2014

- next person takes over, ...
- After two turns, the game is over.

7.5.2 Interview Freeze¹⁴³

- Group is divided into teams of 7-8 participants. Each team has a moderator.
- The teams stand in circle.
- Two people stand in the middle, facing each other. One is the interviewer, one the interviewee.
- The interviewer asks the interviewee questions about his/her morning rituals and activities (e.g. When do you get up? What is the first thing you do after waking up? Why do you use 3 alarm clocks? And so on).
- The interviewee gives a short answer - sometimes only yes or no.
- Other people in the circle observe, if they want, they can tag interviewer or interviewee and take their place and continue.

Variations

Talk about other routine activities, e.g. the “when I get into my classroom ritual” or the “when I come home from school” ritual.

Debrief

In the teams, share observations about good questions, insights, learnings, how easy it is to deviate to non-related topics and lose focus.

7.5.3 Observed accurately¹⁴⁴

- Ask the participants to sit down in the classroom.
- Distribute questionnaires with 10 questions.
- Ask the participants to answer the questions in writing – no talking in the class (3 min).

Debrief

Debrief with the whole group. Participants should discuss how accurate or inaccurate their observations about common things often are. Use this to point out the importance of detailed observations and post-research debriefs.

Questions you can use:

- How many buttons does the coat have that you are wearing today?
- How many steps does the stairway to your classroom have?

¹⁴³ SAP SE DT Jam page / Games / 2014

¹⁴⁴ SAP SE DT Jam page / Games / 2014

- How many males/females are in your class?
- What type of roof is on the house we are in today?
- What is the first name of your sister/brother/grandpa...?
- What is your friend's phone number?

7.5.4 Who are you¹⁴⁵?

- Ask for a volunteer to leave the room.
- While the volunteer is away, the rest of the participants decide on an occupation for him/her, such as a driver, or a fisherman.
- When the volunteer returns, the rest of the participants mime activities.
- The volunteer must guess the occupation that has been chosen for him/her from the activities that are mimed.

7.6 Synthesis Energizer Games

7.6.1 Danish Clapping¹⁴⁶:

- 2 persons stand face-to-face
- They start with clapping on their thighs with both hands and then lifting their arms to the left or to the right or in the middle - each of them in the direction he/she likes and then clapping again the thighs.
- If the 2 people happen to both move their arms in the same direction e.g. both up in the middle, then they need to clap their thighs and additionally then clap their hands in front of them.
- After 30 seconds try to do the whole clapping faster.
- End after 2-3 minutes.

Short video to show how it works:

<https://vimeo.com/27098943>

7.6.2 The sun shines on...¹⁴⁷

- Participants sit or stand in a tight circle with one person in the middle.
- The person in the middle shouts out “the sun shines on...” and names a color or articles of clothing that some in the group possesses. For example, “the sun shines on all those wearing blue” or “the sun shines on all those wearing socks” or “the sun shines on all those with brown eyes”.

¹⁴⁵ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

¹⁴⁶ SAP SE DT Jam page / Games / 2014

¹⁴⁷ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

- All the participants who have that attribute must change places with one another.
- The person in the middle tries to take one of their places as they move, so that there is another person left in the middle without a place.
- The new person in the middle shouts out “the sun shines on...” and names a different color or type of clothing.
- Stop after 5 minutes

7.6.3 Group statues¹⁴⁸

- Ask the group to move around the room, loosely swinging their arms and gently relaxing their heads and necks.
- After a short while, shout out a word.
- The group must form themselves into statues that describe the word. For example, the facilitator shouts “peace”. All the participants have to instantly adopt, without talking, poses that show what ‘peace’ means to them.
- Repeat the exercise several times.

7.6.4 Fruit salad¹⁴⁹

- The facilitator divides the participants into an equal number of three to four fruits, such as oranges and bananas.
- Participants then sit on chairs in a circle.
- One person must stand in the center of the circle of chairs.
- The facilitator shouts out the name of one of the fruits, such as ‘oranges’, and all of the oranges must change places with one another.
- The person who is standing in the middle tries to take one of their places as they move, leaving another person in the middle without a chair.
- The new person in the middle shouts another fruit and the game continues.
- A call of ‘fruit salad’ means that everyone has to change seats.
- Stop after 5 minutes

7.6.5 I’m going on a trip¹⁵⁰

- Everyone sits in a circle.
- Start by saying “I’m going on a trip and I’m taking a hug”, and hug the person to your right.

¹⁴⁸ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

¹⁴⁹ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

¹⁵⁰ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

- That person then has to say “I’m going on a trip and I’m taking a hug and a pat on the back”, and then give the person on their right a hug and a pat on the back.
- Each person repeats what has been said and adds a new action to the list.
- Go round the circle until everyone has had a turn.

7.7 Ideation Energizer Games

7.7.1 What if? Chain¹⁵¹

- The team shall stand up, form a circle.
- Anyone can start (the first who volunteers).
- The actor and the person standing next to her/him close their eyes.
- The actor asks a question starting with „What if...?”
- The question challenges any rule of the world, it can be about anything.
- The next person in the circle answers with closed eyes, and then asks a new „What if...” question, that can be both related or unrelated to the question before.
- It goes on until wild ideas start to come.

Example Questions:

- What if horses would ride on people?
- What if there were no gravity?
- What if rain would melt anything?
- What if elephants could fly?
- What if a 6 year old child chosen randomly would become the president of the USA?

7.7.2 Word Chain¹⁵²

- Participants stand in a circle
- The facilitator starts the game by saying a term that consists of 2 nouns, e.g. database
- The next person picks up the second noun and creates a new noun starting with the second part, e.g. basecamp.
- The next person goes on, that way nouns like these might come up: campground – groundwork – workstation ...
- End after 5 minutes

¹⁵¹ SAP SE DT Jam page / Games / 2014

¹⁵² dito

7.7.3 I am a tree¹⁵³

- The group is divided into teams of 6-8 participants.
- The teams stand in a circle.
- One person starts the game.
- (S)He steps in the middle of the circle and says: e.g. “I am a tree” and stands tiptoeing with his arms widely spread out.
- A second person steps in the middle and builds on what was said before, e.g. by saying “I am an apple that has fallen from the tree.” and crouching underneath the tree.
- A third person steps in the middle and builds on what was said before, e.g. by saying “I am a worm eating from the apple” and bowing down to “eat from the apple”.
- When 3 people are in the circle, the round is over, tree and apple leave the circle, the worm stays and the next story starts with the worm.
- ... and so on

Variations

The variations of the story are developed during the game by the participants. The story flow only depends on the people’s creativity.

7.7.4 Clap exchange¹⁵⁴

- Participants sit or stand in a circle.
- They send a clap around the circle by facing and clapping in unison with the person on their right, who repeats the clap with the person on their right, and so on.
- Do this as fast as possible.
- Send many claps, with different rhythms, around the circle at the same time
- Stop after 5 minutes

7.8 Prototyping: Energizer Games

7.8.1 Human Car¹⁵⁵

- Group is divided in teams of 5 participants.
- The teams build a human car

¹⁵³ dito

¹⁵⁴ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./ http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKVc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHMP6ZQhcQw&bvm=bv.96339352.d.bGQ

¹⁵⁵ SAP SE DT Jam page / Games / 2014

- o where everyone is connected
- o only 3 feet and 2 hands touch the ground
- o which moves and makes sounds
- The teams spend 10 minutes prototyping
- Each car demonstrates how it moves through the race track over 5 Meters.

7.8.2 Spaghetti Tower¹⁵⁶

- Each team gets 20 pieces of spaghetti, one marshmallow and 1 m of tape.
- The teams build their towers from the spaghetti and tape (10 min).
 - o The marshmallow has to be on the top of the tower.
 - o It has to be as high as possible.
 - o It has to stand without support for at least 10 seconds
- Each team presents the tower and demonstrates that it can stand without support for at least 10 sec. The moderator measures the height.
- The team with the highest tower wins.

7.8.3 Paper Airplane Contest¹⁵⁷

The participants split into groups of 3-4 people

- They have to build a paper airplane together according to the following rules:
 - o Silent – no talking allowed!
 - o With only one hand: right-handed people use their left hand and vice versa
 - o They get 3 sheets of paper so that they can iterate their airplane prototype
 - o They should tag their final prototype with a team name
- After 3 minutes, all teams come together and let their airplane fly. The team that could build the plane flying the longest distance wins!

7.8.4 Knees up¹⁵⁸

- Participants stand in a close circle with their shoulders touching and then turn, so that their right shoulders are facing into the center of the circle.
- Ask everyone to put their hand on the shoulder of the person in front and to carefully sit down so that everyone is sitting on the knees of the person behind them.
- Get up, sit down!

¹⁵⁶ SAP SE DT Jam page / Games / 2014

¹⁵⁷ SAP SE DT Jam page / Games / 2014

¹⁵⁸ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

- Give each participant a number (several participants could have the same number).
- Then tell a story that involves lots of numbers – when you say a number, the person(s) with this number has (have) to stand up.
- Stop after 5 minutes

7.9 Test: Energizer Games

7.9.1 Balloon Tower Contest¹⁵⁹

- Divide the group into teams of 3-6 participants.
- Every group gets 5 or more balloons, tape, a newspaper and twine
- They have 5 minutes to build a tower out of the material. BUT: tape and balloons MUST NOT TOUCH!
- The team who builds the highest tower in the given time wins

7.9.2 Countdown¹⁶⁰

- Ask participants to form a circle.
- Explain that the group needs to count together from one to 50.
- There are a few rules: they are not to say 'seven' or any number which is a multiple of seven.
- Instead, they have to clap their hands.
- Once someone claps their hands, the group must count the numbers in reverse.
- If someone says seven or a multiple of seven, start the counting again.
- Stop after 5 – 10 minutes

7.10 Further Energizer Games

7.10.1 Mime a lie¹⁶¹

- Everyone stands in a circle.
- The facilitator starts by miming an action.

¹⁵⁹ SAP SE DT Jam page / Games / 2014

¹⁶⁰ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHMP6ZQhcQw&bvm=bv.96339352.d.bGQ

¹⁶¹ dito



- When the person on their right says their name and asks “What are you doing?” they reply that they are doing something completely different; for example, the facilitator mimes swimming and says “I am washing my hair.”
- The person to the facilitator’s right then has to mime what the facilitator said that they were doing (washing their hair), while saying that they are doing something completely different.
- Go around the circle in this way until everyone has had a turn.

7.10.2 The king is dead¹⁶²

- The first player turns to their neighbor and says, “The king is dead!”
- The neighbor asks, “How did he die?”, and the first player responds, “He died doing this”, and starts a simple gesture or movement.
- All participants repeat this gesture continuously.
- The second player repeats the statement and the third player asks, “How did he die?”
- The second player adds another gesture or movement.
- The whole group then copies these two movements.
- The process continues around the circle until there are too many movements to remember.

7.10.3 The longest line¹⁶³

- This game requires a lot of space and may need to be done outdoors.
- Divide into teams of eight to ten people.
- Each team must have the same number of members.
- Explain that the task is to create the longest line using participants own bodies and any clothing or things in participants pockets.
- Participants are not allowed to collect other things from the room/outside.
- Give a signal for the game to start and set a time limit, such as two minutes.
- The team with the longest line wins.

¹⁶² dito

¹⁶³ 100 Ways to energize groups/ The International HIV/AIDS Alliance, 2002./

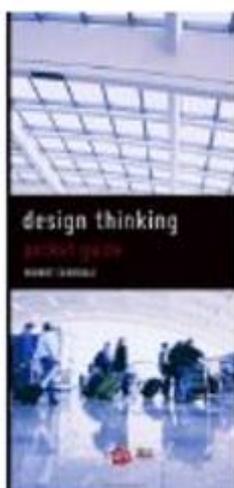
http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.icaso.org%2Fvaccines_toolkit%2Fsubpages%2Ffiles%2FEnglish%2Fenergiser_guide_eng.pdf&ei=ZKeKvc25KMbyUJ2hh-AH&usq=AFQjCNFWKowuSqAcNsx909VoHMP6ZQhcQw&bvm=bv.96339352.d.bGQ

8. Book Recommendations

There are a lot of books out in the world – but these are our recommendations for you. Most of them were used to collect the content for this Educator Guide. If you would like to find out more about Design Thinking and its methods, these ones are very useful, some especially when working with kids or young people.

8.1 Design Thinking Pocket Guide

The guide is rich with useful information and even the table of contents has a depth of utility for thinking about DT from a 10K foot level, down to the ground view. The text is provocative and I found myself jotting notes, thoughts and questions in response to the text.



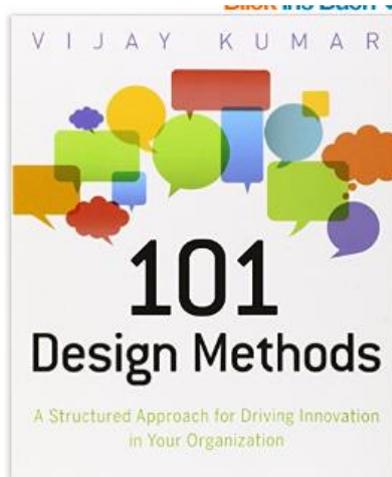
Design Thinking Pocket Guide

Robert Curdale

ISBN: 9780989246859 published by Design Community
College Los Angeles 2013

8.2 101 Design Methods

Design Thinking is a method that can be applied to nearly any endeavor, business scenario, or social reform. In his book, 101 Design Methods, author Vijay Kumar describes how design methods can be applied as a science, rather than through art, through practical steps of observation, reframing, ideation, prototyping, and planning." (Contract Magazine, May 2013)



101 Design Methods: A Structured Approach for Driving Innovation in Your Organization

Vijay Kumar

ISBN 978-1-118-08346-8 published by John Wiley & Sons, INC., Hoboken, New Jersey Oktober 23, 2012

8.3 Value Proposition Design

The authors of "Value Proposition Design" are obsessed with bringing practical tools and processes to the fields of strategy, innovation, and entrepreneurship. They all share a common passion for making business concepts simple, beautiful, and applicable so that they become useful and indispensable in the lives of business professionals and organizations.



Value Proposition Design: How to Create Products and Services Customers want (Strategyzer)

Alexander Osterwalder, Yves Pigneur

ISBN: 987-1-118-96805-5 published by John Wiley & Sons, INC., Hoboken, New Jersey, October 30, 2014

8.4 How to Have Creative Ideas

Bestselling author Edward de Bono presents 62 practical exercises to encourage creativity and lateral thinking

[De Bono] is a one-man global industry whose work is gospel in government, universities, schools, corporations, and even prisons, all over the world." – Times 2010

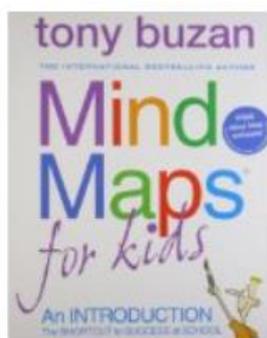


How to Have Creative Ideas: 62 games to develop the mind: 62 Exercises to Develop the Mind

Edward De Bono
ISBN: 987-0-09-191048-8 published in 2007 by Vermilion, an imprint of Ebury Publishing (which is a Random House Group company), January 8, 2008

8.5 Mind Maps for Kids

Tony Buzan deserves a medal for coming up with the sanity-saving concept of Mind Maps, which make difficult mental tasks possible, even pleasurable, by engaging the right side of the brain, where colour and creativity reign...The system can be a lifesaver for children with dyslexia-type difficulties.' Time Out

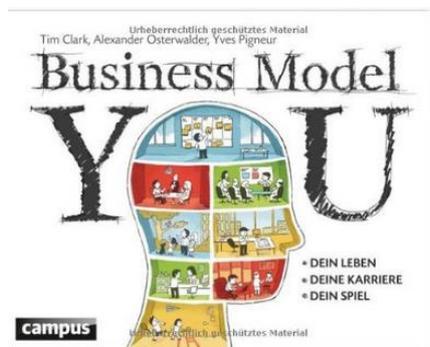


Mind Maps for Kids: The Shortcut to Success at School: An Introduction

By Tony Buzan
ISBN: 978-007151332 published by Harper Collins Publ. UK; Edition Reissue (February 3, 2003)

8.6 Business Model YOU

Replace career uncertainty with career confidence by using the single-page blueprint that's helped reinvent thousands of organizations worldwide. It's the systematic way to optimize the most important business model of all: business model you. (Book back)



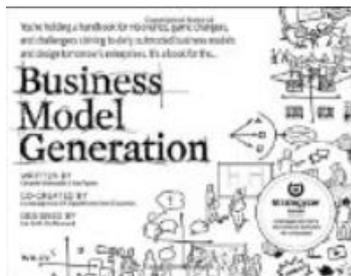
Business Model You: A OnePage Method For Reinventing Your Career

By Tim Clark, Alexander Osterwalder

ISBN: 978-1118156315 published by John Wiley & Sons, INC., Hoboken, New Jersey, 1st Edition March 27, 2012)

8.7 Business Model Generation

Business Model Generation is for those ready to abandon outmoded thinking and embrace new, innovative models of value creation: executives, consultants, entrepreneurs -- and leaders of all organizations.(Book back)



Business Model Generation: A Handbook for Visionaries, Gamechangers and, Challengers
Alexander Osterwalder, Yves Pigneur, J. T. A. Wegberg
(Translator)

ISBN: 978-0-470-87641-1 published by John Wiley & Sons, INC., Hoboken, New Jersey, August 8, 2011

8.8 Lebendige Strichmännchen zeichnen

(only available in German, but the pictures speak for themselves)

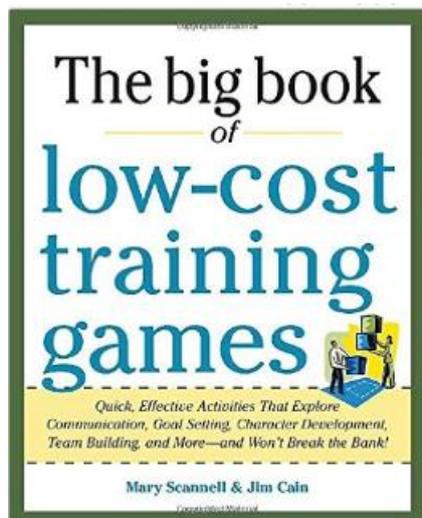


Lebendige Strichmännchen zeichnen

Andreas Tschudin

ISBN: 978-3-86355-319-7 published EMF
(Edition Michael Fischer), 2015 www-emf-verlag.de

8.9. The big book of low-cost training games



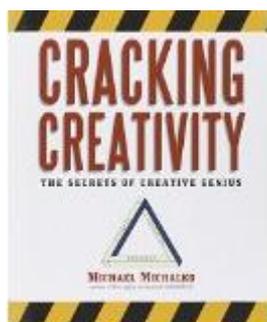
The big book of low-cost training games

Mary Scannel & Jim Cain

ISBN: 978-0-07-177437-6 published Mc Graw Hill 2012

8.10 Cracking Creativity

The Orlando Sentinel "CRACKING CREATIVITY unveils the secrets of creative genius and brings life-changing creative techniques into everyone's reach. By comparing the thinking strategies of over 100 of history's most creative minds, the book shows readers how to approach problems with new vision and discover a world of innovative solutions to everyday challenges



Cracking Creativity: The secrets of Creative Genius

Michael Michalko

ISBN: 978-1580083119 published Ten Speed Press; New edition edition (June 26, 2001)