

# DESIGN THINKING: A PRACTICAL GUIDE

## A HANDBOOK FOR MANAGERS IN HIGHER EDUCATION



DT.Uni.  
Design Thinking Approach  
for an Interdisciplinary University



Co-funded by the  
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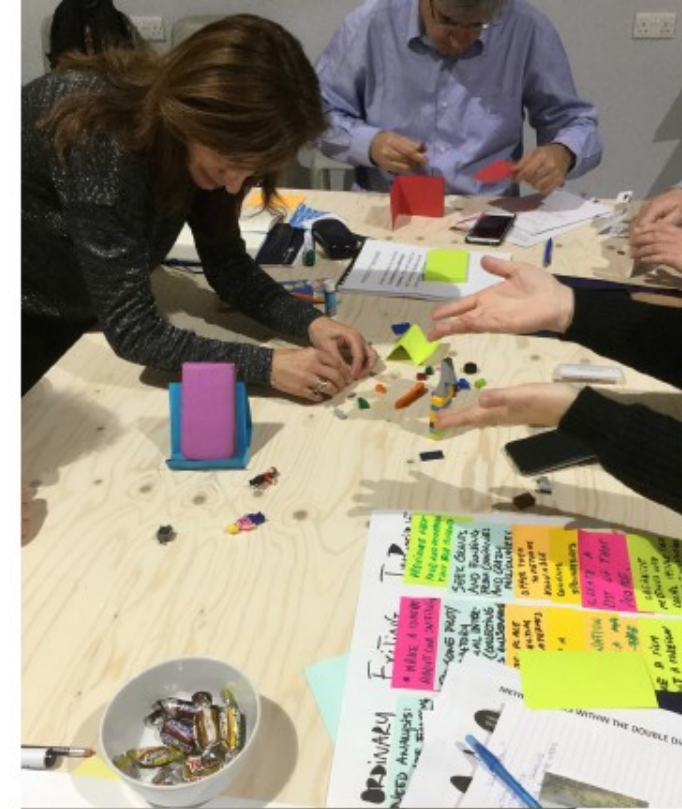
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# DESIGN THINKI NG FEATUR ES

- addressing wicked or complex problems
- focus on the user
- combines divergent and convergent thinking, ie, generating and filtering ideas
- learning by doing and haptic processes
- working in groups - no hierarchy
- allowing people to fail

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## UVA MANAGERS WORKSHOP

### Summary of design thinking tools used

	Form and define	Introduction to design thinking Get to know your team Challenges introduced
	Explore	First formulation of challenge - 'How might we....?' Who? What? Why? How? Interview potential user Persona mapping
	Create	Brainstorming and ideating 'How might we....?' Selection and evaluation of ideas through dot voting Brainwriting - done between sessions
	Prototyping	Introduction to prototyping Choose idea to prototype Build prototypes working in groups Test prototypes Teams present work through storytelling
	Evaluation	Reflection and evaluation

### Team

André Nusselder, Katusha Sol, Natasa Brouwer, (attended Dresden, Birmingham or both), Frank Nack

### Attendees

Nine in total split across University of Amsterdam, Vrije Universiteit Amsterdam, University of Applied Sciences, Amsterdam, Utrecht University and Reflect Academy covering a range of disciplines and mainly inexperienced in using design thinking.

### Pre-workshop organisation

In preparing and organising our workshop we focused on increasing the motivation of our participants to explore and solve 'wicked' problems in education policy. We wanted to explore two increasingly popular approaches: interdisciplinary education, particularly in relation to explaining phenomenon, solving problems and/or creating a product, as well as design thinking as a method of solving problems innovatively.

We also combined our reflections on the Dresden and Birmingham workshops as well as our own experience and consideration of our participants' pressured timetables. In particular, we wanted to minimise the time spent writing on sticky notes! In response we devised a blended learning design, with some activities done face-to-face in workshops and an online activity between workshops, as explained in more detail below.

Prior to attending the workshop, participants were sent some preparatory materials including an introduction to design thinking and the DT.Uni book of best practice case studies. They also completed a questionnaire including the issues they felt that they wanted to tackle. We used the completed questionnaires to devise two challenges for the workshop and split the participants into two groups to respond to those challenges.

### Workshop management

As described above we chose a blended learning structure for our workshop. This comprised two three hour face-to-face sessions on day 1 and on day 5 and three online group assignments comprising two hours to be completed between sessions.

André developed the workshop and led the face-to-face sessions, aided by Katusha as facilitator. Natasa undertook the organisation such as preparing presentations, sending out and collating the questionnaires and preparatory materials, recruiting participants and documenting the workshop through photographs and videos.



UvA - building a persona

The two themes tackled by participants were:

1. What digital platform would support lecturers and better facilitate their work?
2. What is needed so that lecturers make more space in their courses for the reflection of STEM knowledge in society? How do we change the curriculum to strengthen interdisciplinary education?

Attendees were assigned to a group to tackle a specific challenge, based on their response to the pre-workshop questionnaire. A summary of the tools used is given above.

Following an introduction to design thinking and a getting to know people exercise our first session explored the challenge through Who? What? Why? and How?. This was followed by interviewing a potential user and a persona mapping activity. Finally we used brainstorming to ideate and create potential solutions. To

conclude the first session, the top three were selected through dot voting.

The days between the face-to-face sessions gave the participants the opportunity for a collaborative online brainwriting to develop their ideas in more depth as well as time for personal reflection about the process. We used Google Docs to enable the online brainwriting.

In the final session our participants built and tested prototype solutions. These are shown in the photos. Throughout we emphasised the divergent and convergent nature of design thinking. We also took great care to reinforce the design thinking process as well as the phase of the process being covered in a particular session.

### Evaluation

Based on pre and post test the participants have improved their knowledge and gained skills in design thinking approach. The participants were very satisfied with the workshop. For example, on a Likert scale of 5, they evaluated the statement "I found the workshop useful for me" at 4.6 and the statement "I found the workshop inspiring" at 4.9.

Examples of how participants plan to use design thinking in the future include:

- to work through complex vision, mission and strategy issues as well as aligning secondary and tertiary education;
- creating an educational vision for the faculty, battling the secondary school teacher shortage, and facilitating more interdisciplinarity within the faculty;
- as a methodology during entrepreneurial group projects;
- employing the understand and observe phases as well as ideation, field research, and stakeholders interviews to gain user insights; and
- solving problems we encounter in the policy team.

Evaluating as a team we felt that the workshop had been very successful. In particular, we felt that the gap between sessions helped our participants to understand the process as well as develop ideas in more depth than would have been possible in a single session.



### Tips and recommendations

- Holding two short sessions helps participants in terms of workload as well as getting to grips with design thinking.
- Short, sharp sessions work well, but need to be well planned and executed.
- Carefully explain the design thinking process throughout a session as well as emphasising the different phases.
- Presenting challenges based on input from participants worked well and helped us to build a thorough and practical programme.



UvA - prototyping








UvA - prototype - team 1



UvA - prototype - team 2

## TU DRESDEN MANAGERS WORKSHOP

### Summary of design thinking tools used

	Form and define	Warm-up Introduction to design thinking Each group finds its challenge
	Explore	Interview User motivation analysis Persona How might we?
	Create	Brainstorming Brainwriting Send a postcard
	Prototyping	Storyboard LEGO walk through
	Evaluation	Exchange of people Group presentation

### Team

Christian Bruchatz and Robert Fischer (Dresden organisers and Birmingham attendees), Peer Kittel (Birmingham attendee), Robert Härer, Martin Meyer (photographer)

### Participants

30 in total, 20 from TU Dresden, 10 from seven members of the DRESDEN-concept research alliance: Barkhausen Institut gGmbH, Saxon State and University Library Dresden, Militärhistorisches Museum der Bundeswehr, Fraunhofer Institute for Ceramic Technologies and Systems, Senckenberg Natural History Collections of Dresden, Helmholtz-Center Dresden-Rossendorf, and Technical Exhibition Dresden

### Pre-workshop organisation

We promoted our workshop as 'Design thinking helps you to successfully deal with complex problems in a diverse group using structuring methods'. To this

end we aimed to teach how design thinking approaches can be integrated into everyday work processes and which methods can be used in particular situations. In addition to our previous work on design thinking, organising the Dresden workshop for academics and our attendance at the Birmingham workshop for managers helped us considerably to decide which tools to use and how to structure the workshop.

We decided to run for 12 hours over 1.5 days and developed a schedule covering explore and create phases in the first day and prototyping as well as evaluation on the second half day. The two days were consecutive. The structure and methods used in the workshop were agreed in one meeting of the facilitation team

Other pre-workshop activities included booking the room and photographer, gathering and transferring supplies (such as, moveable walls, crockery, utensils and other refreshment essentials as well as the workshop materials (sticky notes, Lego, paper, templates and pens)), recruiting participants and distributing and collating responses to the pre-workshop questionnaire.

The latter allowed us to set exemplar complex challenges and allocate participants to groups to tackle one each of the challenges.

### Workshop management

On the day our team comprised four moderators and a photographer. We had the help of two extra people at the start and end of the day in setting up the room and tidying-up at its close. Our participants worked at TU Dresden or one of the DRESDEN-concept partners. Their job roles were various and included team management, budget responsibility or a task-related management function predominantly in administrative or science-supporting work.

To help our attendees in developing skills in divergent and convergent thinking as well as designing creative solutions, we mainly relied on the methodological framework and methods tried and tested at the Dresden and Birmingham international workshops.

The tools we used are summarised in the table above. Due to our relatively long schedule, we were able to use more than one tool at each stage and check that teams had grasped the basics before they moved to the next stage. For example, we included team bonding exercises: creating individual profiles and building a marshmallow tower - see pictures.





TUD - marshmallow tower

Each group then undertook an in-depth exploration phase including interviews and user motivation analysis to surface the challenge as 'How might we....?' for a specific persona. Create included brainstorming, brainwriting and send a postcard - closing the first day with each team having a solution for prototyping on the following day.

In our opinion, prototyping is a very important stage in the design thinking process and we devoted the final half day to that process as well as testing and evaluating the workshop as a whole.

The challenges proposed and tackled by our participants were:

1. How can we activate a demotivated employee to best use his knowledge and skills for the long-term team vision or for the team as a community?  
Prototype: Storyboard
2. How can we support individual public relations staff members to use a uni-wide work-flow, its structures and its network?  
Prototype: LEGO walk-through
3. How can we combine different competencies in strategy development effectively?  
Prototype: LEGO walk-through

4. How do we use design thinking methods in a team setting to achieve a project goal (eg, the introduction of a wiki)?  
Prototype: LEGO walk-through

5. How can I (as a leader) organise a team where personnel change regularly? (How can we help a long-term employee to work well with a new employee who takes over part of his work?)  
Prototype: LEGO walk-through picture presentation with pitch.



TUD - meeting the team



TUD - prototype building



## Evaluation

Our participants enjoyed the workshop and felt that they would use design thinking in their future work. Examples of opportunities they identified were:

- Introducing the culture of iterative problem solving in group work methodically.
- Designing work-flows more effectively and efficiently by incorporating interdisciplinary cooperation.
- Creating more sustainable solutions through creative processing and efficient documentation.

## Tips and recommendations

- Using a local network, such as the DRESDEN-concept research alliance, can be helpful in attracting participants.
- Take time to present completed example templates for each method to aid understanding.
- Let people clear their working tables and meet afterwards for a final feedback session.
- Some people don't like music as a trigger during brainstorming.
- Brainstorming variations should start from bad and go through to childish.
- Allow people to change groups during the workshop if they so wish.
- Try 'Kill your idea' as an alternative to 'Send a postcard' because voting and choosing (convergence) can be covered in brainwriting.

- Try to build the timetable round the needs of participants, eg we found that a 9am start and lunch break at 1pm is too late for administration managers (which is different from researchers!).



TUD - prototype example



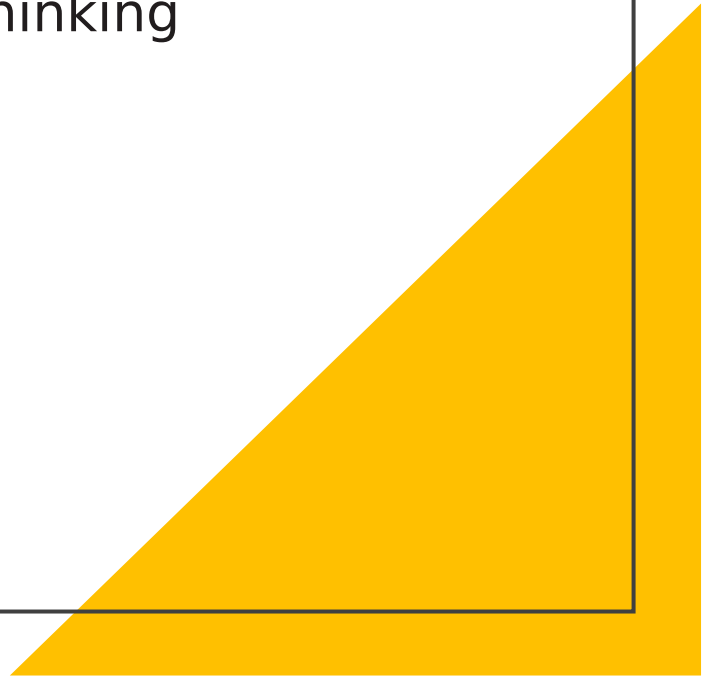
TUD - prototype example



TUD - prototype example

# OBSERVAT IONS REFLECTI ONS THOUGHT S

- group working – lack of hierarchy
- building of a prototypes to test or demonstrate ideas
- implementing design thinking
- experts vs novices





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