A GUIDEBOOK FOR
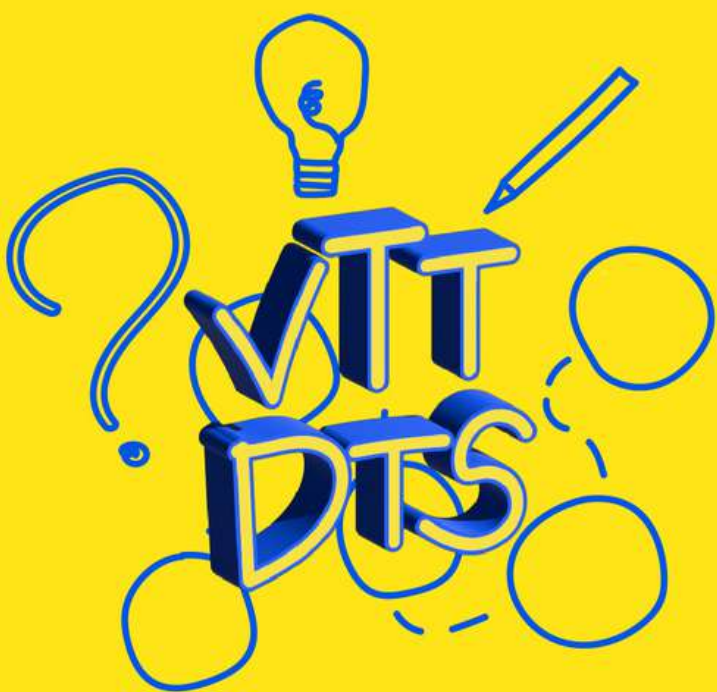
VISUAL THINKING TECHNIQUES & DESIGN THINKING STRATEGIES AS TOOLS FOR YOUNG LEARNERS IN A VIRTUAL WOLRD

VTT DTS

educraftor

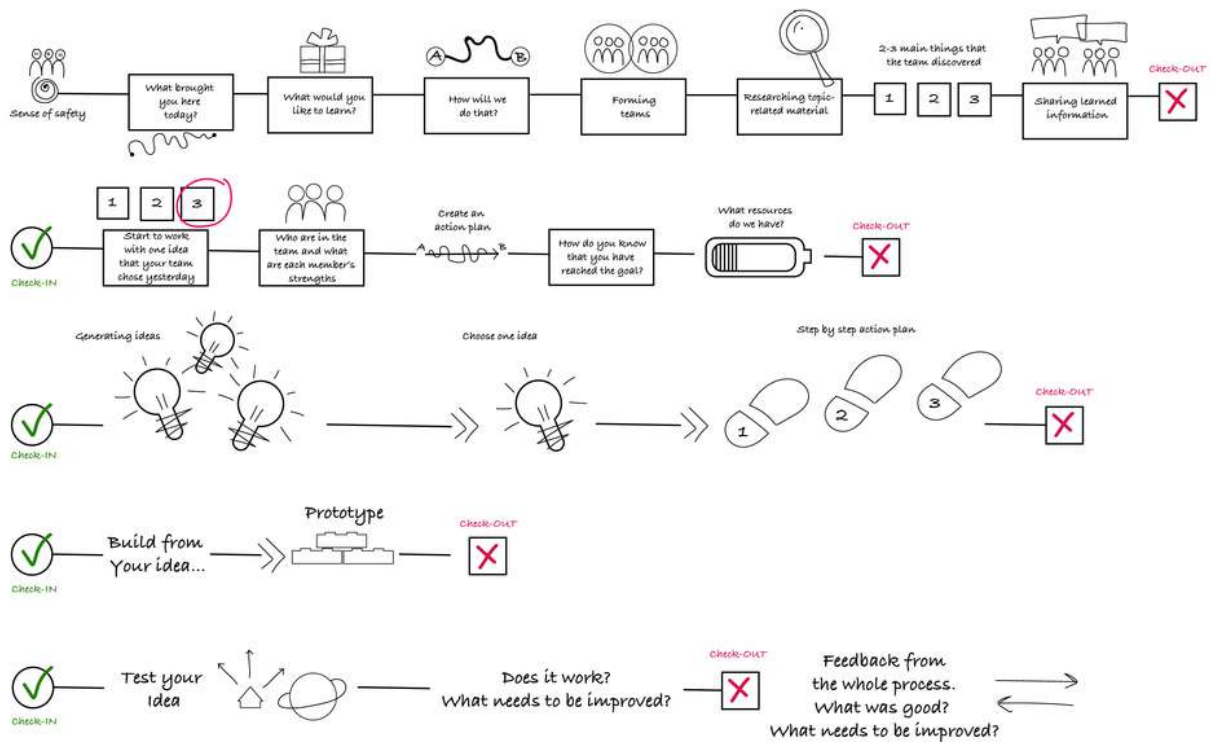Crossing Borders

ŠIUOLAIKINIŲ DIDAKTIKŲ CENTRAS

TARTU KUNSTI-SCKOOL

Design Thinking process in a nutshell

Sense of safety — What brought you here today? — What would you like to learn? — How will we do that? — Forming teams — Researching topic-related material — 1 2 3 — 2-3 main things that the team discovered — Sharing learned information — Check-OUT

Check-IN — 1 2 3 — Start to work with one idea that your team chose yesterday — Who are in the team and what are each member's strengths — Create an action plan — How do you know that you have reached the goal? — What resources do we have? — Check-OUT

Check-IN — Generating ideas — Choose one idea — Step by step action plan — 1 2 3 — Check-OUT

Check-IN — Build from Your idea... — Prototype — Check-OUT

Check-IN — Test your idea — Does it work? What needs to be improved? — Check-OUT — Feedback from the whole process. What was good? What needs to be improved?

CONTENTS

INTRODUCTION

Do you find it challenging to keep your learners' motivation up during the lessons?

Do you find traditional ways of teaching ineffective or are you looking for a change?

Would you like to try out new methods but don't know where to start?

This material will present you with Design Thinking and Visual Thinking as methods for teaching problem solving both when learning and at the learning community. The material will guide you through the different stages of the methodology and provide you with ideas and examples on how to bring more visual elements into your lessons.

The project behind the material will be introduced to you explaining the why's and how's. Then the material will guide you through the theory behind the Design Thinking and Visual Thinking methodologies and explain how the process works.

The material also includes 12 case studies with different target audiences: basic, secondary and adult education, and teacher training. The cases for teachers and educators have been explained in more detail in order to open up the process of teaching and applying the methodology.

Finally, the material will provide you with a few templates to start building your own plan to implement Design Thinking methodology in your own teaching. The lesson plans are aimed at basic education and upper secondary school but they can easily be modified according to your purposes.

The plans guide you through the planning process and help you choose the most appropriate tools. The more thoroughly you have planned the process, the easier it will be to implement it. Moreover, with a ready plan you get to observe your learners and the whole process better which makes it easier to modify the tools or processes for the next time. It's a learning process, right?

All the pictures and images in this material have been collected during the project and have been provided by the coaches and teachers (unless otherwise mentioned).

ABOUT THE PROJECT

The project was designed to encourage young learners - pupils, students, young people, and also teachers, coaches, and youth workers to stay creative regardless of where they are: in the classroom, in their usual working environment or at home in isolation.

COVID-19 has had a highly negative impact on the mental well-being of young learners. Being isolated at home, being deprived of social interaction and communication with their peers in the classrooms or in their usual environments, young people had to cope with these challenges alone. The need to address these problems is the reason to have this project.

The project aims to integrate arts and creativity to develop digital skills among target groups by means of innovative practices in a digital era when distance learning has become the "new normal".

It also aims to enable students, pupils, the youth, and teachers with learning opportunities of innovative digital tools by making use of and boosting their creativity.

Strategic partnership

Tallinna Kunstigümnaasium (project coordinator) and Tartu Artschool

Educraftor

Crossing Borders

Šiuolaikinių didaktikų centras Všļ

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The project objectives:

- To enable young learners and teachers to use creativity and arts to stay balanced despite the situation they are facing;
- To develop new skills and knowledge among young learners and teachers that help them cope with problems, challenges, physical limitations;
- To train students and teachers to use Visual Thinking Techniques for the creative visualisation of their situation and condition;
- To train students, teachers and youth workers to use Design Thinking Strategies for the solution processes of various problems in life, in studies, in work;
- To elaborate a methodological framework for a course to be delivered in schools, youth centres, organisations on Visual Thinking techniques and Design Thinking Strategies;
- To shift the approach to planning and delivering lessons to a new one, more creative, engaging and animated with the use of Design Thinking Strategies.

Project activities and timeline

The planning of the project started in spring 2021 and continued over the summer. The training for trainers was implemented between November 2021 and March 2022 during which 5 training sessions were held online to familiarise the educators with the methodology.

The trainers then replicated the sessions at their local levels between April and November 2022, for example, at their schools or organisations, or by inviting youth workers to learn about the process. The trainers reported on their experiments back to the project to be included as case studies in the Intellectual Output that works as a reference guide for further trainers to apply the method in their educational work.

After the experimenting the trainers organised local exhibitions to disseminate their examples and spread awareness of the methodology.

The launching conference of the methodological framework was held in Estonia in January 2023. Educators from around Europe were invited to join to learn about the project, methodology and how to implement it in education.

Project results:
- Methodological framework
- Case studies
- Lesson plans for educators to start applying the method
- Project website

VISUAL CREATIVITY AND DESIGN THINKING as tools for young learners in a virtual world

Trainings on Design Thinking Strategies and Visual Thinking Techniques
- ★ 5 Training sessions for trainers
- ★ Replication of each training session by the trainer at the local level – in own school/organization, inviting people from youth centres, etc.
- ★ Planning and testing 2 lessons per teacher using DTS and VTT as teaching methods. Application in practice of the knowledge during own lessons/activities. Collection of information about this practical exercises. Sharing the information with the IO manager.

Trainings

Intellectual output

Intellectual Output
A methodological framework document that consists of a course of teaching VTT and DTS in 12 lessons of 45 minutes for general school (1st to 9th grade), as lessons of interest, and 21 lessons of 75 minutes for high school students as an elective course.

Exhibition of Students work in every partner country with the involvement of local associated partners. Exhibitions and the Virtual festival will involve learners from all countries from participating organizations but it is not limited to them only. Adult learners and educators partici-pating in our activities will be invited to present their works.

Exhibition

Festival

Virtual festival of animation works of participants with the main theme "The impact of COVID-19 isolation on my mind as a young person".

DESIGN THINKING AND VISUAL THINKING AS METHODS OF LEARNING

Design thinking has entered the field of education when traditionally it has been used in the world of business (Luka 2014). It enables both the educator and the learner to use their creativity through visualisations, and it is a very hands-on approach to learning.

Design thinking and visual thinking offer tools for the educators to diversify their methods of teaching and engage learners in the process as active participants. The educator presents the tools and support for the classes but the learners do the work themselves.

Visualisation is a powerful tool for learning as it might often be easier to remember visuals than just plain text.

It also enables others to understand more easily the vision that you have in your head. This is also why visual tools are used widely in the DT process.

Anyone can draw, right? Some people tend to shy away from drawing and do not find it comfortable if they are unsure about their artistic skills. As a child, most people love to draw and they seem to have an endless source of inspiration for drawing. Later on we tend to become more critical of ourselves and stop drawing.

Thus it will be very useful to start from the very basics when introducing visual tools to the learners.

Design thinking is a process that consists of 5 different stages: empathise, define, ideate, prototype and test.
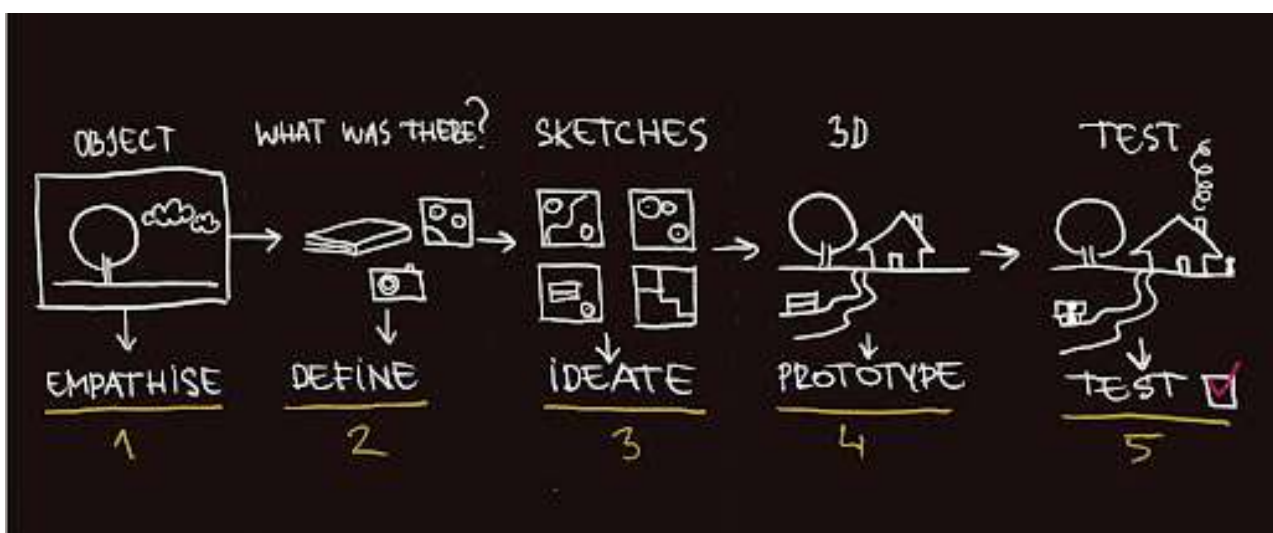
Design thinking can be implemented in the classroom in multiple ways. You can allocate several lessons to go through the process thoroughly or you can take a shortcut and you can squeeze in all the stages within just one or two lessons.

With the latter, the stages will be very short but it still gives structure to try and tackle an identified problem. In the end, it all depends on the scope of the problem and the desired outcomes of the process. Especially, if you have limited time and resources for your project, the process can be adapted accordingly to serve its purpose in the most useful way.

DT can also be used to tackle problems in the classroom or the school community or help improve the well-being of the learners - and the educators! So it is not only a tool for teaching.

A few ideas on how to use DT process in education:

  "How could we have more sports activities in our school yard" in PE lesson.

  "How could we make our school building more beautiful" in an Art lesson.

  "How could we understand the history of our families in a better way" in History lesson.

Sometimes it might be meaningful to cover only some of the stages but that might already set the wheels in motion towards the desired solution. In fact, the process is, above all, flexible, and thus finding the tools (or stages) that serve your purpose best can still generate great results from your learners – as long as you go out there and experiment something new.

For example, you could ask your participants to do something already before starting the process. Alternatively, sometimes you might already have the solution in mind when starting the process and still achieve excellent results.

But here you should notice that it changes the process as the solutions are usually created only later during the ideate stage and when followed thoroughly, the learners enter the process with the purpose of discovering and defining what the problem is before trying to solve it.

Nevertheless, the utilised stages provide a structured process for problem-solving based learning.

In education the Design Thinking process can also be seen as two-fold:

the educators themselves first need to go through all the stages when planning how to implement the process in their teaching and only then it is the pupils' or students' turn to go through the different stages when trying to find a solution to a problem or topic set by the teacher.
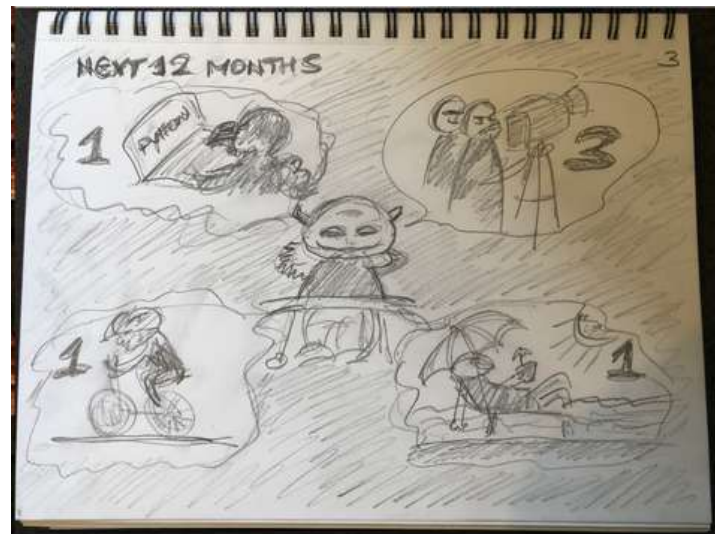
You might very often notice points of improvement once you have completed the process with your class.

But the fun part of Design Thinking is that you can always use it to find new ways of teaching and learning or develop the process along the way.

It's so good for me to step out from my comfy-zone and just let go.

Learned a lot, I feel like I can draw a book now.

NEXT 12 MONTHS

What is the interconnection between word and picture, picture and word, in terms of how we reflect upon our ideas?

WHAT IS DESIGN THINKING?

Design thinking is a structured process that focuses on process-solving through developing creativity and innovation skills. It proceeds through different stages that aim at landing on a solution that effectively solves the possible problem. Alternatively, the process can be followed to create something new - whether we are talking about a product, a service or a novel way of teaching. It encourages thinking outside the box and focuses on the users' needs.

The process has been divided into 5 phases:
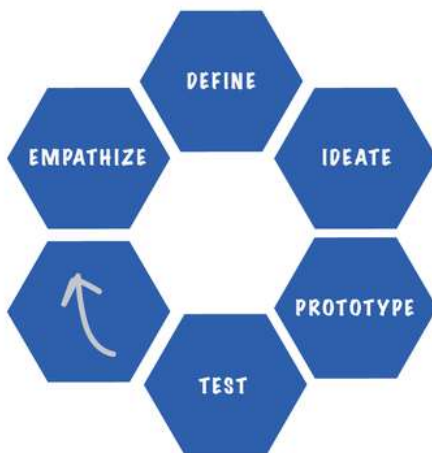
Very often, however, it can be noticed during the process that things are not like one assumed them to be in the beginning.

The stages do not proceed linearly but a revisit to previous stages is very often needed.

Sometimes it can be noticed at the final steps that the solution that seemed promising and inspiring does not actually work at all, and so the whole process might have to be started all over again.

With DT there is often the problem of genuinely focusing on the target groups' needs instead of bringing in one's own experiences and opinions. This might narrow down the chances for novel solutions as the participants already believe they know the answers.

Read more about Design thinking from the sources:

Design Thinking for Educators, © 2012 IDEO LLC. All rights reserved. http://designthinkingforeducators.com/

Grocholl, Jershov & Orav, 2016. Visual Facilitation Cookbook

Luka 2014. Design Thinking in Pedagogy. *Journal of Education Culture and Society*

EMPATHISE

In order to be able to create genuinely effective solutions, it is crucial to understand the problem thoroughly. What actually is the problem here and why does it need to be solved? What needs to be done differently or changed for things to work out better? You might already have a specific question in mind which you wish to find an answer to, or you might have a problematic topic which requires elaboration to get to the roots of your problem(s).

At this point it is good to do some research to find out how others have tackled the same problem and what solutions there already exist. There is no point in reinventing the wheel, but if the problem still exists after several attempts of trying to fix it, it might be a good idea to stop and reflect the problem a bit further. Have the previous solutions actually focused on the user or have they been based on general assumptions on how things are?

Sharing with others what you already know about the problem or collecting your expertise might help you at later stages to find the most effective solutions to your problem. It is also good to think about what it is that you would like to learn more about this topic. Alternatively, you can go out and see or feel how things are, or how the users see or feel about it.

To successfully implement the phase it is important to be curious, ask questions, listen and not judge.

The keys to success are Listening, Understanding, Identifying, Respect and Support. An Empathy map is also a useful tool to reflect on what you feel, think, do or say.
You can also visualise the current situation or think what emotions are attached to it.

EMPATHISE TOOLS

CHALLENGE

Why does it bother you?

What is the problem?

Is this problem real?

Notes

OBSERVATIONS

What already exists?

Who uses it?

In your country?
In the world?

Notes

BACKGROUND

What is your expertise?

What would you like to learn regarding this topic?

Notes

VISUALISE CURRENT SITUATION

What is the situation right now?

Notes

REACH OUT

Go out and see/feel how things are

What have you noticed?

Notes

DEFINE

Before starting to further define the identified problems, it is good to stop for a little while to reflect on the conclusions made in the empathise stage.

It is useful to identify which parts of the information are actually relevant to us to be able to narrow down the topic and to define the final problem.

In order to create a solution to the problem it is important to identify who we are solving the problem for, ie. who is our target group and whose problem it actually is.

In this stage the main aim is to redefine the problem statement from the target's point of view and not yet work on the possible solutions to the problem.

Visualisation is again a powerful tool here to conceptualise the target and the desired change. It is good to outline what are the things that will change in the process and how you can measure the change. How do you know you have reached your goal?

DEFINE TOOLS

WHAT DID WE FIND OUT?	VISUALISE DESIRED SITUATION	FOR WHOM ARE WE SOLVING THE PROBLEM?	ORGANISE THE INFORMATION	WHAT IS THE MEASUREMENT?
What info is important for us? What is useful for us?	Where would you like to be in 5 years? What will change when you have achieved the result?	Who is your target group? What does he/she like? Where does he/she go? Who does he/she listen to? How old is he/she?	Make some system for organising the info	How do you know that you have reached your goal?
Notes	Notes	Notes	Notes	Notes

IDEATE

The purpose of ideation is to generate as many ideas as possible. Do not stop to ponder whether an idea is good or bad but just keep brainstorming. At the beginning, a high quantity of ideas is more important than a high quality.

After defining the problem carefully and keeping the end user in mind, you can come up with numerous solutions to your problem.

Towards the end of this stage you will narrow down your ideas and choose the ones that you find worth carrying on with.

When brainstorming is done in groups, it is easier to build on others' ideas and mirror your ideas with others. Also, when you share your ideas no matter how unrealistic they might sound, you can get feedback from others to develop your idea further or it might spark up an idea for someone else.

When the flow of ideas runs dry, pick the best ones for further elaboration. How could the ideas be realised? Again, use brainstorming to expand on your chosen ideas and visualise them so everybody can see them.

Before you carry on further with your idea, it is good to do a reality check:

Is your idea actually feasible? Will you face some obstacles or challenges with your idea? How realistic is it actually?

If you still think you are good to go, you can move on to build your prototypes. Otherwise you might want to return to the previous stages or continue ideating.

IDEATE TOOLS

DIFFERENT BRAINSTORMING TOOLS	GO TO A DIFFERENT ENVIRONMENT	THE WORST IDEAS BRAINSTORMING	DO SOMETHING ELSE	FOCUS AND SELECT
Collect as many ideas as possible. There is no right or wrong ideas!	Go out of your comfort zone	What is the worst solution?	Talk to people Listen to music Draw Take some me-time	Submit you 1-3 favourite ideas and prioritise potential ideas
Notes	Notes	Notes	Notes	Notes

PROTOTYPE

It is wise to collect the feedback also in written form (or you can take notes if it is given orally) for you to remember the precious comments received from other participants.

Now it is time to build a model of your idea to make it more concrete and also for others to better get a grasp of what the idea was about.

The prototype can be built, drawn or introduced in the form of a story.

Depending on the idea and the participants, you can use any materials that are suitable for the purpose. You might go for cardboard or paper, Lego bricks or some other random objects, role play, a story board or a diagram.

Getting feedback from others is crucially important here and enough time should be reserved for this stage. Discussion is usually the most effective way of getting feedback but to get an honest opinion from others requires a secure feeling between the participants.

Go through the feedback carefully and think how you could improve your prototype. Which parts already worked well and what needs to be done differently?

You do not need to make all alterations suggested by others but you can think which of them would be worth taking into account to create a prototype that works better.

After moderating your prototype you can have another round of feedback to see if the changes you made got you to the right direction.

storytelling   storyboarding   lego

paper + glue   drawing   food   snow   anything

PROTOTYPE TOOLS

STORYBOARD	BUILD A 3D MODEL	DRAWING	USE RANDOM OBJECTS	STORYTELLING
Create a storyboard	Build a 3D model with software, food or wood	Draw, paint, sketch	Build a prototype from toy blocks, stationery, snow, clay, paper, kitchen utensils etc.	Tell an emotional story
Notes	Notes	Notes	Notes	Notes

TEST

Now it is time to see how the concept works. Whether you are testing your own plan on implementing this method into your teaching or your learners are testing their prototypes, it is important to document the stage for you to be able to estimate the effects of the concept.

How did it work? Did it solve the problem set in the beginning of the process?

Again, collecting feedback from the target group helps you to measure the effectiveness and outcomes of the process. The feedback will guide you in refining your concept further. Are there some parts that should be excluded completely? Is there something you should add to the process for it to work better? Which parts work well and should be maintained as they are?

At this point you may also find it useful to revisit the previous stages and even go back to square one especially if the concept completely missed the set targets.

Once you have completed the first round of testing, it is good to plan further ahead. What comes next?

Depending on your project you might want to do several testing rounds and keep track on how the concept evolves. Or you might want to spread the word about the method you have used in your teaching and have your colleagues join you in deploying the method in your institution.

TEST TOOLS

QUESTIONS	FEEDBACK	STOP	START	CONTINUE
Does the target group use it? How do they use it?	Talk to people and ask meaningful questions. Listen to feedback without interrupting	What should you stop doing?	What should you start doing?	What should you continue doing?
Notes	Notes	Notes	Notes	Notes

VISUAL THINKING TOOLS IN THE DESIGN THINKING PROCESS

"Use a picture. It is worth a thousand words."
- Arthur Brisbane -

We are programmed to decode images more effectively than text, and only a very small part of our communication is actually verbal. Most of the information we receive comes through our eyes and a majority of it is perceived without us even noticing it.

Moreover, in our globalised world finding a common language is not always the case. But we do understand images.

By using images we can very effectively communicate our thoughts to others. We also process this kind of information quickly and attach emotions and memories into the interpretation process. If we want to explain a solution to our problem, we can sketch it much faster than describe it by using only words.

Surely a combination of images and words is the most efficient way but will require less verbal explanation as others will get the picture more easily with the help of the images.

Got the picture?

Visual design thinking

Design thinking utilises visual tools throughout the process as it is easier to work together and share ideas and thoughts with others through visualisation. Whether it is a poster, a mind map, drawings, a story board or just random words on a paper, it is easier to grasp the concept with just one glance.

As with visual tools less words are needed and the information can be packed effectively, it is also easier to build on the ideas as you can, for example, connect separate pieces by drawing lines or arrows.

To be able to visualise your message does not require advanced artistic skills but just some courage and playfulness to get started.
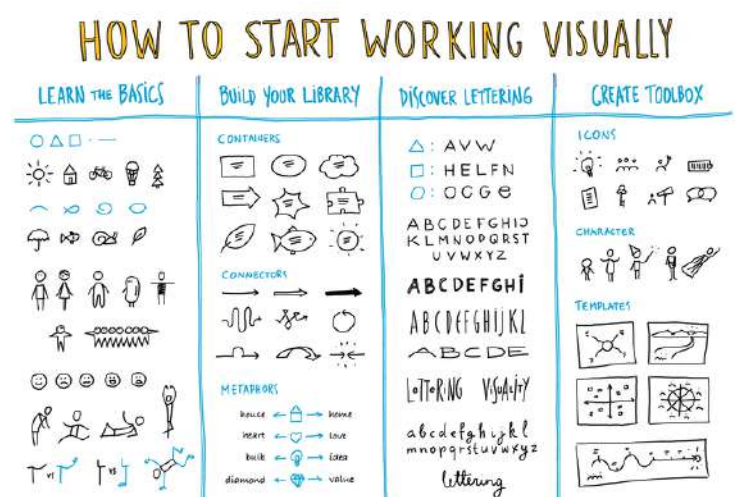
Depending on the participants, getting them to work visually might be easy or it might require some persuasion.

Younger participants will be more likely to get excited about the opportunity to express themselves visually and enjoy the visualisation tools used in the project. Already teenagers will be sceptical about their drawing skills or might find the visual tools childish, but also adults who are not used to visualising their ideas might shy away from the tasks.

Whichever the case, it is good to do some warming up to work with visuals.

Children learn to draw well before they learn to write, and drawing seems to be a natural way for them to communicate their thoughts and ideas. Therefore it will probably be easier to use visual tools with children, but they might need practice when learning to use visualisation as a way of learning or planning realistic solutions to problems.

Older participants might need practice just to get used to drawing again.

When trying to figure out how to get started, starting from the very basics is always the safest option:

a line, a square, a circle, a triangle and a dot.

These will already take you very far as by combining them, you can sketch almost anything you want. How to combine the shapes to form the desired images is another question as very often the greatest limitation to your artistic skills is your imagination.

Practice makes perfect, as the saying goes, and thus the skill of drawing can only be learnt by drawing.

This is also why it is recommended to start the whole process with a few visualisation warm-ups before presenting them as the tools used in the design thinking process.

Once you master the basics and want to expand your skills, you can build on your visual library and create yourself a toolbox which you can easily use when you need to visualise something.

Using visuals might also become a permanent part of the way you function after noticing how effective tools they are.

Read more about visual tools from our sources:

Grocholl, Jershov & Orav, 2016. Visual Facilitation Cookbook

Kim S van den Berg. Crash Course in Visual Thinking

Lamm E., 2018. Visual Starter Kit for meeting notes and project planning. www.sketchnotesbook.com/visualstarterkit

COACHING

Co-designing the coaching process

The designing of the coaching process **started with an intensive dialogue** between Educraftor and TAS coaches. Some of the main topics were:

During the planning phase, the coaches from Educraftor and trainers from Tartu Art School (TAS) decided to switch their standard roles. This time, Educraftor coaches would develop their visual thinking skills by making the plans and also the online training sessions more visual than before. The trainers from Tartu Art School would practice coaching the design thinking process. They would all work in close collaboration.

In this way, the coaches believed it was a better possibility to **tie together the design thinking strategies and the visual thinking techniques**, rather than keeping them separate and building the training so that the methodologies would be practised separately.

- The purpose of the project was crystallised through this metaphor: We support the young learners to *paint themselves out of a corner*.
- One of the main goals will be to encourage people to use drawing and visual thinking as a method.
- How visual do we make the training?
- How do we structure the methodology?
- The issue of combining two methodologies: Are we making a visual version of design thinking or are we weaving design thinking stages into visual thinking?

It was then seen that actually team coaching is the combining methodology. The design thinking process gives the framework for the participants to work in, and the visual thinking tools make the learning explicit and support both the coaching as well as the design thinking process.

It was a learning process also for these coaches and trainers, but they got inspired by the challenge and planned and implemented the training from these starting points.

Therefore, all three core elements – *team learning, design thinking and visual creativity* – were designed to connect and support one another.

SCHEDULE

1st round: online training

The online training sessions happened between November 2021 and March 2022. These sessions are described in the next few pages. It was the 1st iteration of design thinking process.

2nd round: train the trainer

It was seen beneficial for the participants to go through all the training sessions before replicating them locally. The timeline for the replication was then set from March to June 2022. It was the 2nd iteration of design thinking process.

The replication was guided to happen in a similar way as the online training sessions. The trainers first engage those peers that they feel are interested in these topics and benefit from the new knowledge and skills. With them, the trainers' own learning process can continue. The starting could be – as in the online training – to invite the local educators into a session and start by empathizing with each other and with the people that they all work with. And then taking it further from there, going through the 5 stages of design thinking.

3rd round: supporting local youth

At the end of the replication phase, the goal was that all participants (trainers and trainees) will be ready to implement the methodologies (design thinking and visual creativity) into their work/ courses/ projects in the fall semester of 2022.

By going through the 5 stages of design thinking, the aim was for the trainers and trainees to have a learner-centric approach in their fall activities and help their students first find some problems around them, to then start solving these issues with the methodologies of design thinking and visual creativity.

It was the 3rd iteration of design thinking process.

Individual coaching

The coaches offered their support during the second and third rounds. The individual coaching sessions happened as online meetings, and were adjusted to everyone's own schedule, goals and needs.
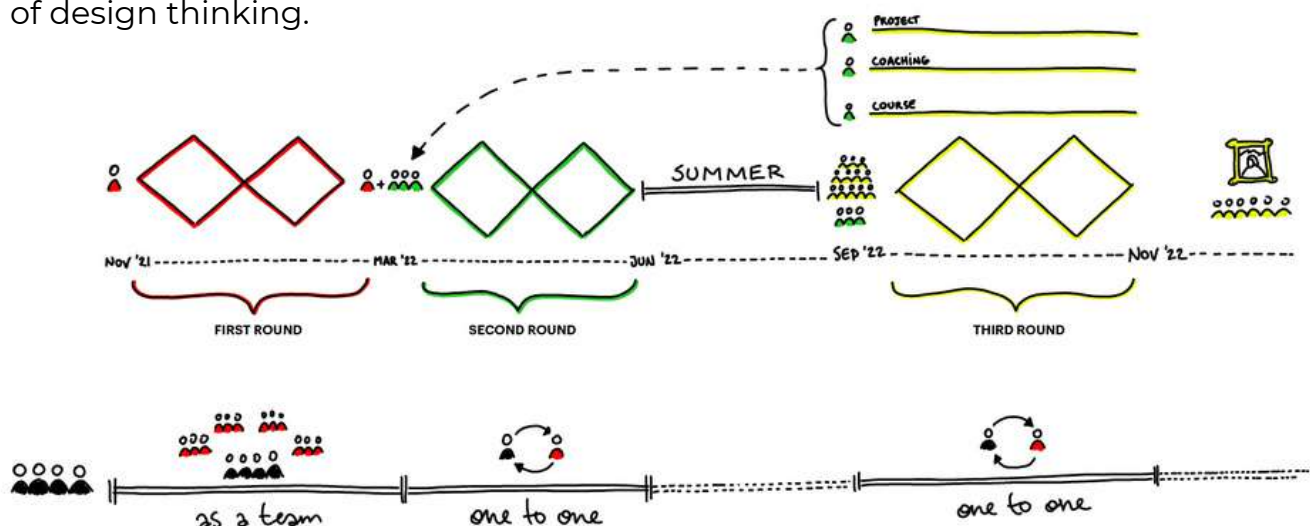
1. TRAINING

Empathising visually

The training began with

- everyone's introductions
- intro to the training course
- getting to know the online whiteboard, Miro.

In the first session, the participants practised empathy through active listening. They also made their thinking explicit by using visual creativity: finding images online or drawing on paper or in Miro.

Basic visualisation techniques were introduced by the coaches, and the participants were encouraged to start using them right away.

Participants were directed to draw different types of lines to visualise, what were the most important events in their lives in 2021. After working individually, they formed groups to share their work, and to practise empathy, creating a better understanding of themselves and others.
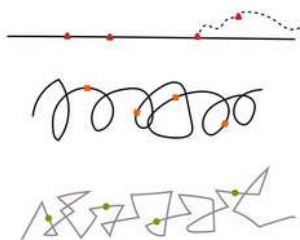
HOW DID YOUR LAST YEAR GO? WHAT WAS IMPORTANT? HOW DID YOU FEEL?

Describe it with a line and point out 3-7 events which were important for you
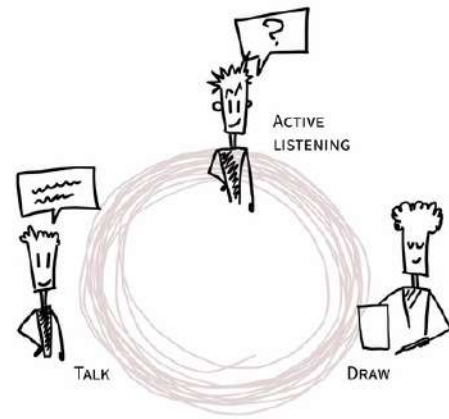
The second session started with participants working in groups of three. Each one was asked to take a role. The roles were:

1. Talking
2. Active listening, asking clarifying questions, repeating or mirroring what was said
3. Observing and drawing, creating visual representations of the discussion.

The participants then switched roles.

After working in groups, all participants got the chance to make their own goals and plans visual. The question was "where would you like to get in 2022?"

"Sharing and listening was good. It was a human moment."
"I was touched, and understood that change is the only way to develop."
"The first step is to let go and go draw."
"It showed that we are different, and we draw differently."
"There was no right or wrong."
"I'm not good at drawing, but I enjoyed it. We can all tell stories with just lines and dots."

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2. TRAINING

Defining visually

The participants were given the freedom to start moving towards the goal that they set for themselves during the previous training session

The third session started with updating "where are we now". The findings that came through the dialogue were made visible, which helped the participants to define the topic or problem more clearly.

Working was made visible using a table in the shared Miro board, from where both the participants, as well as the coaches, could then get an overview of the status.

The learning process was similar to the first session: going into smaller groups, dialoguing, sharing with other participants, making notes visible, reflecting and planning the next action.

- *What is the topic or challenge you are working on?*
- *Is your primary plan still in place or are changes needed?*
- *What could help you?*
- *Do you have obstacles?*
- *How would it be if all obstacles were taken away?*

On the second day, the coaches explained and then shared a few examples of the design thinking process.

The participants were challenged to reflect on the topics or challenges being defined and "locked down" before moving to the next stage:

- "Why is this an important topic for you?" (is it just a topic or actually important for you)
- "Who are your focus group or users?" (to check that they are designing a potential solution for someone, not just for themselves)
- "Where does the problem arise from?" (to check whether this problem is arising from real-life observations and experience, not just from their own assumptions)
- "What is your next step?" (are they ready to move forward)
- "What about your team, what thoughts are there?" (to confirm whether have they come to the defined topic/challenge only through their own thinking or through empathising with others).

Reflections from the coaches:
- The participants felt the power of visualising the future and recognised the importance of optimism for teachers.
- Personal preferences came out in visualisation.
- They realised the importance of finding their own style in visualisation.
- The focus on empathising and then defining made the visualisations much more detailed.

On the second day, the participants experimented with different brainstorming activities. The exercise of coming up with *the worst possible ideas* was helpful in seeing their topic from a totally opposite perspective, and therefore providing them with new ideas.

These new ideas were then used in *brainwriting* when participants continued to build on others' ideas.

Ideating visually

Before moving into the actual ideating phase, some time was spent checking everyone's status, how far in the process they were.
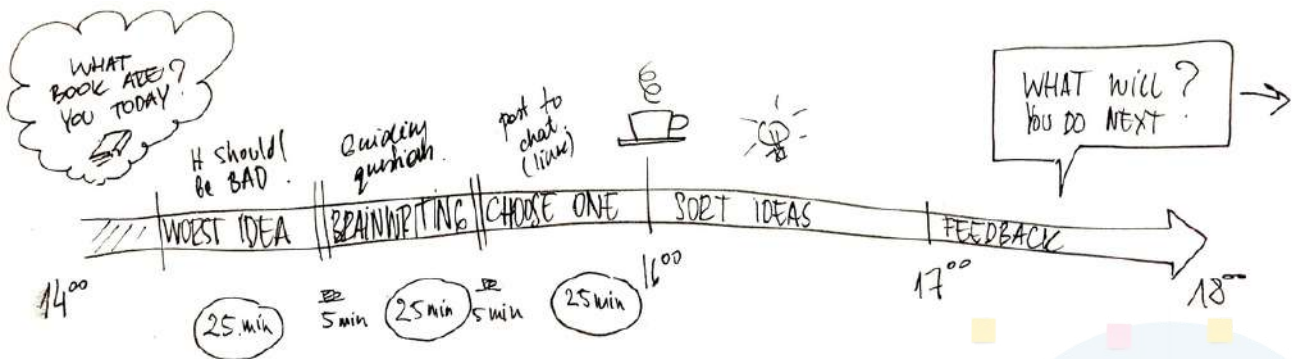
At this point of the training, the participants were given more and more space to take responsibility and drive their own process. The coaches opened several breakout rooms in the Zoom call so that the participants could go and work on their own, or in small groups. The coaches were reachable at all times and visited the breakout rooms from time to time to provide support when needed.

A few guiding questions:
- What would you suggest to a friend in this situation?
- What would you do if you knew that you can't fail?
- Who could help you?
- How can you keep focused?
- What is missing?
- What will you do next?
- Imagine where you could be in 6 months, what would be your decision today?

After the intensive ideation phase, the participants sorted out the ideas, for example by using the *bullseye* method of placing the most useful ideas in the centre and the less feasible ideas in the outer circles.

The session ended with a reflection.

Reflection questions:
- *What did you notice and learn from today's process?*
- *Which of the ideation tools was most effective for you?*
- *Which ideation tool would you use with your students?*
- *How was the timing of the activities, enough or not?*
- *How much did your initial idea transform with the help of others?*
- *What is your plan for the next training session?*

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4. TRAINING

Prototyping visually
The session started with two playful and engaging activities.

1) Check-in: "What kind of a device/machine/mechanism are you today? Draw and tell."

2) Rapid prototyping: "Collect 7 different items from your home or office (paper, glue, sticks, some plastics, etc.) and create a prototype in 10 minutes."

The participants then shared their work in smaller groups. Everyone enjoyed the activity which helped to ignite a creative mindset.

The coaches then shared a few examples of prototypes and design mistakes, to highlight the importance of going through the different stages of design thinking.

The participants were then given time and space to work on their own prototypes. The format of the prototype could be basically anything, and the participants used paper and pen, PowerPoint, Canva, items from nature, photographs, etc.

After this, the group came back together; work was shared, sparring and support were provided, and notes were recorded.

On the second day, the goal was to support the participants in planning the next stage: testing.

Emphasis was put on *what kind of information you need to collect* and *what are the requirements and the right environment for your testing.* The participants worked in smaller groups to spar each others' plans. The coaches supported them by providing visual tools and schemes.

Your challenge: Run your test before the next session.

storytelling   storyboarding   lego
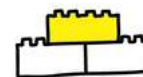
paper + glue   drawing   food   snow   anything

5. TRAINING

Testing & reflecting visually

The coaches shared their personal experiences of a design thinking process without testing and the consequences of it. Testing saves time, effort and nerves since the mistakes become visible before the actual use of a new solution.

The participants then shared their experiences of testing.

The others were listening and mapping their findings visually to either "north" indicating the things that worked during the testing, or "south" indicating those parts of the testing, that revealed weaknesses in the solution.

The second day was dedicated to concluding all the training sessions.

This included
- Motorola reflection (the results are presented on the next page)
- Feedback to coaches
- Aquarium session by the coaches, where they revealed the scripting of each training session, what had been the "～～" and the reasons behind their choices.
- As the last assignment for the participants, they were asked to draw the visual design thinking process, their understanding of it.
- The coaches then shared templates to support the replication of the training with the accompanying words "take this and improve it".
- A Google Forms was shared to support capturing the replication experience.
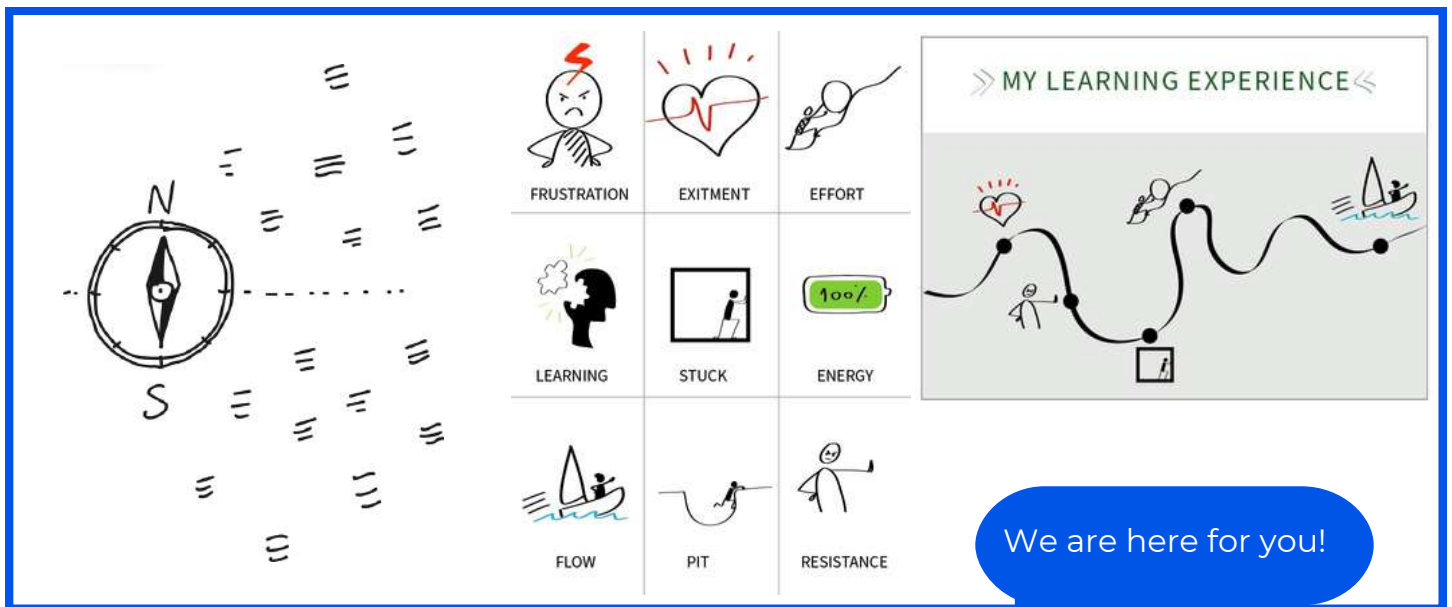
The participants then made their own learning paths visual. For this purpose, the coaches designed a few visual elements, and the participants used these as well as their own illustrations. They were then shared and reflected on.

The coaches shared calendars for the participants to reserve individual coaching sessions with them.

TAKEAWAYS

Trust the process!

Throughout the training, the coaches helped the participants reflect on the process: what had happened, what had been the reasons behind the decisions of designing the learning process in such a way, and the theory behind the activities of each session.

The participants were intentionally left with a level of uncertainty. Supporting the participants to make their own goals visible, as well as encouraging them to ask open questions, stay curious to explore, and take responsibility for their own learning process, were the main drivers of the coaching.

For many of the participants, this approach to learning was challenging, however rewarding when "the dots were connected".

The coaches divided their roles into front-end and back-end coaching. The front-end coach interacted with the participants while the back-end coach observed what was happening and would support both the front-end coach as well as the participants with their reflections and questions. This methodology of team coaching was encouraged to be tested during the replication, when possible.

The coaches supported the learners by
- setting tasks or challenges
- asking questions
- listening
- repeating what was said
- leaving room for the participants to try and share
- encouraging them to do brave experiments
- helping them to connect the dots.

Motorola reflection results:

What was good?
- We were able to design our learning process.
- It pushed me out of my comfort zone.
- Teaching through practice.
- Communication and reflection dominated over theory.

What should be changed?
- I would have wanted more theory about design thinking.
- I would have wished for more time to concentrate only on this project.
- People were going too much in and out of the training sessions.

What did you learn?
- How to solve problems efficiently.
- That visuality is not creating a skilful masterpiece but rather icons and crafts.
- To use design thinking outside of the usual design practice.
- Patience, group work, creativity.

What will you put into practice?
- Be as visual as possible.
- Going through the 5 stages of design thinking quite fast to come up with a new solution.
- To use design thinking in teams and with students.
- Miro, as well as the new mindset.

CASE STUDIES

The 12 case studies presented in this section will provide you with examples on how the participants in the coaching applied the methodology in other contexts.

The iterations have been implemented in basic education (pupils aged 7 to 16), secondary education (students aged 16 to 19), adult education and teacher training. The iterations were also implemented with youth workers and other specialists involved in the education system.

The iterations with pupils and students operate as examples on how Design Thinking can be implemented in the school context with the help of different visual tools.

The iterations with teachers, youth workers and education specialists have been explained in more detail in order to illustrate the implementation of the different stages. The aim is to help you as an educator to implement the process in your own work.

Moreover, the case studies showcase a broad selection of different tools that can be used during the different stages of the process.

The comments and general observations of the iterations also provide you with insightful reflection on how the choices made during the planning and implementation of the cases actually worked and what needs for improvement there might be - for you to avoid the pitfalls and ensure more successful trials.

With some of the cases the resources were limited and the process was adapted accordingly to best serve the purposes of the case. Yet the results show that even though some of the stages might have been completed with less focus than intended by the DT process – or even skipped completely – they still achieved excellent results.

However, skipping some parts will inevitably change the process, which has been demonstrated by the case studies in the project.

1st to 4th graders Lithuania

Creating a reading centre - how to increase reading skills and improve pupils' behaviour during breaks

I feel full of ideas.

Target: 1st to 4th graders (7-to-10-year-olds) at VDU licėjus Sokratus

Teacher: Lina Ignatavičiūtė

Background: Pupils are often very loud during the breaks. Some of them want to play games, others do not, but they do not know what else to do. Therefore we decided to find a solution which would help them relax and rest during the breaks.

Goals & motivation: How to increase our pupils' reading skills and make changes in their behaviour during breaks?

Learning outcomes: The pupils were highly motivated and involved in the process. They learnt to build on their ideas and understand how they could be implemented. They showed responsibility to maintain the created space afterwards.

During the process the children will understand how they can implement their ideas.

The project will also show children their abilities which cannot be noticed in structured lessons and therefore the project requires a lot of time.

Visual thinking helps to better analyse problems and find appropriate solutions.

It also revealed that a teacher in every discipline can use visual thinking in the teaching process.

"I learned how to build my thoughts."

LESSON PLAN

1 Empathise
Discussion about the problem with the class, coming to an idea of a reading space.

2 Define
Group work: Why is a reading space needed and what benefits could it have?

3 Ideate
Creating visuals of the reading space and selecting the ones that could be prototyped.

4 Prototype
Creating their own prototypes.

5 Test
Building the reading space and testing its effects on the children's behaviour.

GENERAL OBSERVATIONS

- The pupils were highly involved in the process and it became very important to them.
- The pupils were full of ideas, and they also involved their parents in the implementation phase by providing materials (eg. fabrics, cushions, lighting) for the pupils to create the reading area.
- Interdisciplinary skills were easy to implement:

  - writing down ideas
  - social problem solving
  - engineering
  - installation
  - maintenance of elements.

- The pupils were pleased that the project was actually carried out completely. They were delighted that they could bring items from home and contribute to the project.
- The pupils have been very responsible for maintenance and management of the space after the project.
- Next time more attention could be given for pupils to name the problem themselves instead of the teacher bringing it up.

4TH GRADERS – CLIMATE CHANGE Lithuania

Save our Earth - how to protect our Earth through creativity

Target: 4th graders (10-year-olds) at Saule private gymnasium

Teacher: Emilija Urnėžienė

Subject: Art and Technologies

Background: The huge amount of waste in the world is a thought-provoking issue for everyone - each of us can contribute to reducing pollution, preserving nature and reducing climate change through sustainable consumption. The problematic question is: how can we contribute to the preservation of the earth through creativity? One way to contribute to sustainable, responsible consumption is to give secondary raw materials such as toilet paper rolls, disposable cups, egg trays etc. a "second life".

Goals & motivation: The objective was to create a product from secondary raw materials with a practical function.

Learning outcomes: The pupils understood that they could also contribute in protecting the Earth. The concrete end products helped them realise how they could use already existing materials in new, practical ways.

The project was carried out in 6 lessons over a 3-week period.

It is important for the teacher to think through the process carefully and what is expected from each stage of DT and how to achieve it. The plan is the basis for everything, because if the activities are not well thought through, the whole DT process will lose quality and the objectives are unlikely to be maximised.
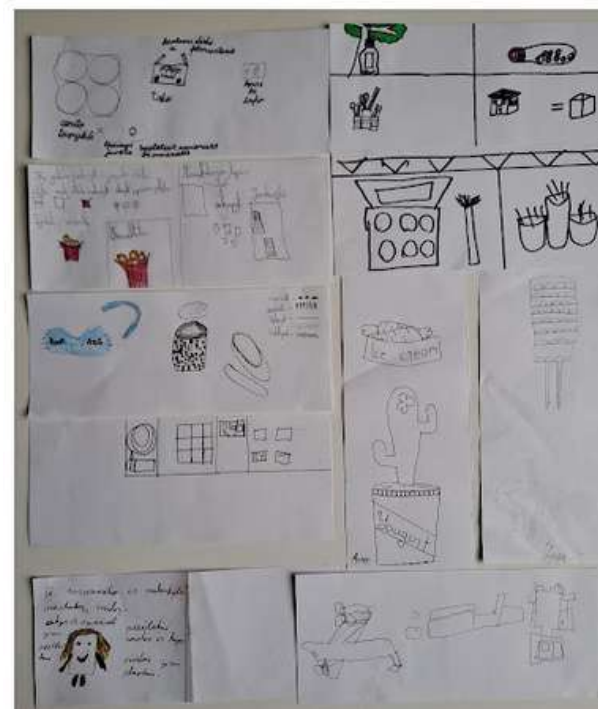
LESSON PLANS

Lesson 1
Creating an empathy map (What do I feel? What do I do? What do I think? What do I say?) – individual work
Discussion with a classmate.

Lesson 2
Problem definition: 4W What? How? Where? Why?
Working individually, pupils answer the questions 4Ws: What? How? Where? Why?
Discussing and highlighting the problem.

Lesson 3
Creating ideas – drawing different ideas
Individual work.
Presenting ideas visually on a piece of paper.

Lesson 4
Creating prototypes.
Recycling craft (product is created from secondary raw materials with a practical function).
Pupils develop their prototypes individually.

Lesson 5
Testing – discussion.
Prototypes are discussed with everyone in the classroom and exhibited in the school space.

Lesson 6
Reflection: how am I feeling?

Exhibition at school

> In my subject, DT helps me to look at a problem in a deeper, more systematic way and solve it.

GENERAL OBSERVATIONS

- At the beginning, the pupils were most involved in the creation of the empathy map, which was an opportunity for each of them to think individually and then to discuss with a classmate.
- The sequence of the steps allowed a deeper and a more systematic approach to solve the problem. At each stage of the DT, the pupils had the opportunity to empathise with the problem they solved by thinking, sharing ideas with each other, raising their own discussion questions, as well as expressing out loud the idea that they were saving resources by resurrecting recyclables for creative work.
- To make the process even more effective, more time should be spent on the activities to be able to focus on them more thoroughly.
- Also more time should have been spent on reflection.
- Without exception, all pupils enjoyed the DT process, most of them said they would like to do it again.
- The prototyping was particularly enjoyed. The pupils felt that they could contribute to the preservation of nature and they were happy that the prototypes had a practical use and could be used at home.
- With a well-thought plan the steps followed each other smoothly and it was easy to achieve the goal.
- The overall evaluation of DT is positive: it helps to solve real-life problems and generates positive emotions.

5TH GRADERS – SELF-PRESENTATION
Lithuania

My business card - how to reduce the fear of self-presentation

Target: 5th graders (11-year-olds) at St. Kristoforas pro-gymnasium

Number of participants: 63

Teacher: Ramunė Guogytė

Background: After summer holidays technology lessons are started with self-presentations, because 5th graders are new to the teacher. The experience from the previous year showed that pupils have a fear of talking about themselves, so this time DT and VT are used to create a more comfortable way for pupils to talk.

Goals & motivation: To reduce the fear of self-presentation as it is very hard for the pupils to talk about themselves.

Learning outcomes: The method made it more comfortable for pupils to talk about themselves and it helped them to get to know each other better. It also helped them to verbalise their strengths and interests and gave them a feeling of success.

The pupils showed surprising levels of creativity.

The process was carried out during 2 lessons with five different classes of 5th graders.

Task: Working individually to create a personal business card that includes:
1. LOGO
2. Name, surname
3. At least 3 things others should know about YOU

Important: Your choice of shape, colours should also reveal something about you.

The pupils were not bored and everyone succeeded in the task even though they were not given any guidelines on how to build the business cards.

GENERAL OBSERVATIONS

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- 97% of the pupils (measured by asking pupils to raise their hand) felt more comfortable talking about themselves with the help of the method and almost everyone wanted to keep these cards to themselves. Some pupils even brought the cards to the next lessons.
- For teachers of 5th graders it is a good way to memorise each student, their hobbies/interests, and what they like.
- Everyone was happy to make their own cards, and present them to class, and they created very unique business cards.
- According to my experience the hardest part for students is to identify a problem. So, sometimes I name the problem and they try to solve it, using DTS and VTT.
- Afterwards a quiz about the pupils' interest could be held to better remember what they liked and what their strengths were.

LESSON PLANS

Empathise
The pupils listed at least 3 things they are good at and what hobbies they have.

Define
To create a business card that reflects their interests, strengths or hobbies.
→ The card must reveal 3 things about the pupil.

Ideate
Planning the business cards. The pupils were not allowed to use words but they had cardboard, paper, pencils etc. to create a 3D business card.

Prototype
Building the business card.

Test
Presenting the business cards to others who try to guess what the card tells about the pupil.

During the presentations I did not feel any fear from them.

7TH GRADERS – CIRCULAR ECONOMY
Lithuania

Fast fashion vs. sustainable fashion

Target: 7th graders (13-year-old) at Klaipėdos Simonas Dachas pro-gymnasium

Teacher: Gustė Vaitkevičiūtė

Subject: Art & technologies

Background: How can we reuse old fabric materials in order to create new products?

Goals & motivation: To reuse old clothes and make new products (clothes, bags or toys) out of them.

Learning outcomes: The process helped them better understand circular economy through real-world problems and use creativity when looking for possible solutions to problems.

DTS and VTT provide excellent tools to teach school subjects through the real-world problems and look for possible solutions through creative work (drawing, prototyping).

VTT methods and parts of the DTS process had often been used during the classes already before the trial. This time more emphasis was put on talking about the problem and the students designed the products based on the ideas of other students.

Visual thinking techniques are always great, and they work best when students are taught to use them themselves for learning new information.

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LESSON PLANS

Empathise
Discussing differences between fast and sustainable fashion.
Creating posters.

Define
Discussing ideas for new products in pairs.

Ideate
Creating ideas - drawing various sketches and noting down technical details using mind maps.

Prototype
Creating prototypes - sewing new products out of the old ones.

Test
Testing the results - together discussing things that went well and things that need improvement.

Outcomes: several repurposed t-shirts, bags and plush toys, all made out of old unusable clothes.

GENERAL OBSERVATIONS

- The students enjoyed working together, discussing ideas, giving feedback to each other, improving each other's work and the practical parts of the project – drawing and sketching. These methods also engaged the students the most because they enjoy drawing and creating posters and they also had the opportunity to work together.
- The prototyping also worked well as the students enjoy practical assignments and they were motivated to improve their sewing skills.
- In general, the graphic facilitation method helps structure information, understand and remember it better than just reading a text about the same information.
- While some of the students liked the idea of creating an item for someone else, most of them would have preferred to just make something for themselves.
- The empathising part, despite taking a lot of time, probably made the students understand better the real-world problem of the impacts of fast fashion on the environment.
- Even though it is good to give enough time for empathising and ideating, it should not be prolonged too much so the pupils will not lose their motivation on the project.

SPECIAL EDUCATION IN SECONDARY SCHOOL – READING
Finland

Increasing reading in special education

Target: Special education class, aged 13 to 16 with different disabilities

Teacher: Satu Paananen

Background: There is a huge need for inspiring pupils to read and become interested in reading since there are many pupils who haven't even tried reading a whole book before entering secondary level education. The problem exists both in normal and special education.

Goals & motivation: To inspire pupils to read and become interested in reading. To give pupils experiences that reading can be fun, which may offer them ways to explore the world through reading at their homes.

Learning outcomes: The process helped the pupils to start reading and overcome obstacles that felt too big by dividing them into smaller pieces. The pupils also learnt to use their imagination which also kept them motivated. Most pupils found the motivation to continue reading.

Finland has a national ReadingSkills - strategy coordinated by the National Board of Education in order to reinforce reading skills and linguistic skills in general. Lukutaito on mielen supervoima (Literacy is a superpower of mind) – is a slogan for this whole project. I have taken part in their training.

Many municipalities also have their own projects that aim to enhance pupils' reading and encourage them to read. I've been a part of that kind of group in my hometown, Salo. It seems that in the future linguistic skills are getting more and more important because much of the information is only available on the internet and there are less and less officials that help face to face.

In special education the process is challenging to run through completely as the group is not solid but pupils come and go.

LESSON PLAN

Empathise

Choosing a book that feels interesting from the school library. For some it took rather a long time for most of the pupils as the task was not too appealing for them. A few pupils who already enjoyed reading found the task easy and enjoyable.

Most of the pupils had to be encouraged and motivated to look for a book and they had to be assured multiple times that they would survive the task of reading a whole book. The reasoning about the benefits reading can have in their future lives was not motivating enough for them.

Communicating with the target audience is very important when you really want to try to understand their challenges.

Define

To get an impression of the book the pupils studied the appearances of the books.

- What pictures or symbols were there?
- What did the font or the colours tell about the book?

The pupils first thought the task was too childish for them but in the end managed to make some very insightful observations:

- The pupils recognised a famous actor from the cover of a Star Wars book and connected it to the movie that has been made based on the book. The connection made the book more interesting for them to read.
- Another book with shattered glass and red colour created a connection to a crime that might take place in the book which increased a feeling of excitement.
- One pupil chose their book based only on the cover because the cover had a picture of a boy and a girl which made the characters more relatable to the reader.

Ideate

Reading the introductory part and discussing the first impressions about the book:

What is the book about?
Will it be interesting for me to read?

Some of the pupils were frustrated about the whole project at this point.

Only a few pupils knew there is an introductory text in books. First the pupils found it difficult to imagine what the book would be like based on the introductory text but after some guiding discussion they were able to estimate whether they would like the book or not.

Prototype

Creating a reading plan with short enough, manageable chapters, since reading a whole book felt like a huge struggle for some of the pupils.

The reading plan with short chapters made it easier for them to read just a few pages first. Some pupils got excited about the book and wanted to continue reading.

Test

Discussing the book with the teacher or a classmate

The pupils found it inspiring to talk about the book with the teacher but talking with a classmate felt awkward for some of the pupils at first.

It was also very rewarding to notice that even though the pupils did not feel like talking about the book at first, but little by little they learned to use their imagination and started to picture sceneries and people etc. in their minds which then motivated them to go on.

GENERAL OBSERVATIONS

- The pupils needed a lot of encouragement to start reading a proper book.
- If a pupil started reading but was not inspired by the book, it was better to allow them to quit reading and change it for another to keep them interested in reading.
- However, this led to a point where a few pupils only read a few pages and always wanted to change, which was not the idea. Thus the pupils were asked to read the book they had chosen last, which removed the idea of the pupils voluntarily reading a book.
- A reading path would probably be more suitable for younger pupils because they work on a more concrete level than junior high -aged pupils, but in general, reading habits should be strengthened already in the early years.
- It might also be very useful to try to engage the pupil's whole family to support the reading process from early on – but that might require support for the parents on how to motivate the pupils to read. → This could serve as a fruitful next project where design thinking and visual thinking could be applied.

1. HOW DOES THE BOOK FEEL LIKE?
* Is the book thin or thick, hard of soft?
* Is it easy to handle?
* Does the appearance lure you to open the book?

2. HOW DOES THE BOOK LOOK LIKE?
What do you expect by the cover picture

3. WHAT DRAWS YOUR ATTENTION TO THE INTRODUCTORY TEXT?
Does it rise any questions? What do you want to know more?

4. WHAT INFORMATION DO YOU GET FROM THE TABLE OF CONTENTS OF THE BOOK?

5. WHAT INSPIRES YOU ABOUT THIS BOOK? DO YOU FIND IT SCARING? HOW DOES IT FEEL TO START?

6. YOUR PLAN FOR READING THE BOOK
When do I read? How many pages at time? Can someone read with me? Can someone discuss the book with me?

7. IS THERE SOMEONE YOU COULD TALK WITH ABOUT THE BOOK?
Mom, Dad, sibling, friend, pet, stuffed animal etc...

8. WHEN MAY I GIVE UP READING IF I DON'T FIND THE BOOK EXCITING ENOUGH? CAN I CHANGE THE BOOK FOR A NICER ONE IN THAT CASE?

+ Find at least 3 interesting facts about the author

THE TEACHER'S ASSESSMENT ON
HOW DID THE TRAINING …

foster teamwork skills?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

There was a part where the pupils should have talked about the book with someone but the execution wasn't so smooth with my group. I should have involved their parents more.

foster creativity?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

I think this plan could have been a good basis for creativity but it would have worked better with younger pupils. There were only a few pupils in this age group that thought creatively.

keep a user centred focus?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

It could have worked but I think we would have needed more time and more motivation to achieve more centred focus. Still there were some good moments and a few pupils were quite into this.

work on facts and not assumptions?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

I think that my approach to this project was quite fact based but I'm not sure if the execution in the class really was it. It would have required more time to explain and prepare pupils for this task.

VOCATIONAL EDUCATION – 1ST YEAR STUDENTS' BOOTCAMP
Tartu Art School
Estonia

Onboarding bootcamp for the first year students

Target: 1st year students at Tartu Art School

Number of participants: 30 (+4 teachers)

Background: To help 1st year students adjust to their new school and schoolmates, special activities are organised for them at the beginning of the academic year.

Goals & motivation: Soft landing and smooth integration to the new environment to feel comfortable and prepared to start the studies.

Learning outcomes: The students were able to come up with solutions that they felt were helpful for themselves and other new students. They felt empowered to be able to point out issues that were important to them. The process also fostered connection between the students and the teachers.

The training was organised during a two-day camp. Traditionally the camp is organised outside the town for working together and having common activities.

Visual design thinking methodology was used with the students this year.

The scheme of the training was islands where each table group formed an island. The groups were formed according to the participants' interests and they worked in the same groups for the whole training.

- DTS and VTT used as methods to integrate into the new school and student life.
- To discuss what fears, feelings or expectations the students had and how to handle or overcome them.
- Focusing more on the activities.
- Sharing with other students to learn to know each other better.

Training schedule

DAY 1

Check-in: Forming the islands

1 The participants created visual journey maps (what brought them there).

2 The participants brought up topics for discussion that they found important for them.
The topics circled, for example, around moving to Tartu by themselves, fears and expectations, impressions and expectations from the first two weeks, what questions they might have, what they found surprising, what worked and what did not.

Empathise

3 Discussion on the topics in island groups
→ 1-3 topics on post-it notes to be put on the wall

Define

Forming new teams (3 to 5 members) around the topics the participants found important.

4 **Forming questions.** Discussion in new teams with **How Might We** questions.
The participants were encouraged to create a visual map of their questions which helped them visualise the problem and the solutions they had found.

> How might we have less stress at school?

5 Research on the chosen topics - finding 3 examples on how the problem has been tackled elsewhere.

6 Defining target audience.

Creating a proto-persona to better comprehend whose problems they were trying to solve. They were given a few guiding questions such as:

- Who is the target group?
- How old are they?
- What are their interests?
- What kind of behavioural patterns do they have?

They could use:

© Pixabay.com

The time frame was, however, too tight to thoroughly do the research and to better focus on building the proto persona for them to better understand whose problems they were trying to solve.

Also the topics the participants chose were not given enough thought and thus were not intriguing enough, which affected the whole process at later stages.

Ideate

7 Brainstorming:
-*reverse brainstorming:* how to make their adjustment to the new school more difficult instead of how to make it easier → transforming the challenges reversely into possible solutions.

- *imaginary brainstorming:* defining the essential elements and replacing other elements to create multiple solutions.

> It is important to always have a subject, a verb and an object and by changing one of the elements, a new solution is created.

8 Sorting, choosing and grouping ideas.

9 Picking the most suitable solution.

10 Check-out: Presenting the solutions

DAY 2

Warm-up

1 Visual exercise: what machine am I today?
2 Discussion and reality check: are the solutions still usable and compelling?

Prototype

3 Building a prototype
The prototypes were created by visualising, formulating or designing the possible solutions. The teachers assisted in the work by asking specific questions, sharing worksheets and methods, sketching, modelling etc.
The groups created activity plans and a schedule, or noticed during the process that the solution was no longer usable and had to start the process from the previous stage again.

A few examples of the prototypes the students created:

- A card game to awake creativity
- An app on how to take better care of their well-being
- A list of concrete steps on how to improve living at the school dormitory
- A well-being party at Tartu Art School

Test

4 Presentations and feedback
At the end of the process the students presented their prototypes to everybody and received feedback from others. They also discussed the problems and obstacles they had encountered during the process.

> The students were surprised how they could come up with concrete solutions in just two days.
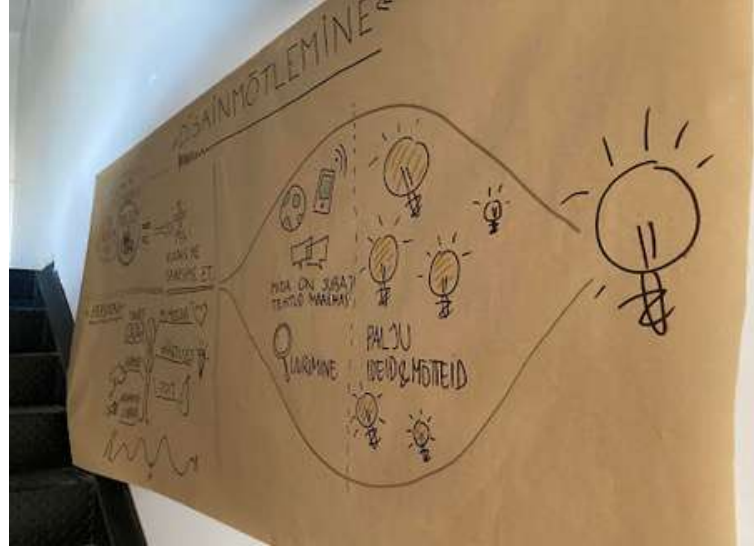
GENERAL OBSERVATIONS

- The training fostered interaction between the students as well as between the teachers and the students.
- The students felt empowered when they were the ones making decisions on topics and procedures and finding solutions to their own problems.
- The participants enjoyed brainstorming, especially the imaginary one, as they could notice how effectively they could come up with possible solutions to the problems.
- The prototyping phase was enjoyable for the participants as they could see the results of their two days' work.
- The teachers had to take the role of coaches in order to interfere less and enable a more learner-centred approach where the students were given more responsibility and initiative.

**THE TEACHER'S ASSESSMENT ON
HOW DID THE TRAINING …**

foster teamwork skills?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

foster creativity?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

keep a user centred focus?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

work on facts and not assumptions?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

UPPER SECONDARY SCHOOL ENTREPRENEURSHIP EDUCATION
Finland

Design thinking and visual learning in Turku teacher training school entrepreneurship education

Target: Upper secondary school students (16-to-18-year-olds)

Teachers: Elise Salonen and Pia Lintunen

Background: During the academic year 2021-2022 our school began a new studying module focusing on entrepreneurship, with the intention that this would become a bigger part of our school's profile, a focus around which we could differentiate ourselves from other schools. We began the module by introducing the basic idea to all first year high school students at the beginning of the year. Then we asked anyone interested to sign up for the studying module, and got 6 students into the program. However, each and every student dropped out – some at the very beginning, and the last ones towards the end of the year. This is the problem that we decided to implement the design thinking process and visual learning tools into.

Goals & motivation: To introduce the new studying module "Yrittäjyys-Norssi" (entrepreneurship education) to our school / to new students and get them enrolled.

Learning outcomes: The changes made into the programme after listening to the students' ideas helped to build a study programme that attracts students to enrol, stay motivated and continue their studies.

TRAINING SCHEDULE

Empathise

1 Inviting the students who have dropped out to talk about the programme and how they think it should be improved. We wanted to find out the reasons why they had felt the programme was interesting and why they had decided to leave it out of their studying programs. We had some coffee and sweets and music in the background.

> We tried to focus on just listening, rather than imposing our own thoughts on them.

2 Collecting a list of the students' answers:

- their schedule was so full already that there was no time/energy for anything "extra", especially anything extra that was to be done independently
- there should not be so many compulsory subjects (in the initial program we had placed studying "extra" languages as a compulsory part of the program)
- it would help out a lot if the studies were in the schedule
- the structure needs to be clearer
- there should be more support for the independent studies
- visits into different businesses, a visit from an entrepreneur would be nice

Define

Based on the students' responses specifying the problems with 2 guidance counsellors and the school's principal.

Ideate

Brainstorming how to improve the study programme. We went out on a cruise and spent the day thinking and talking about ways to improve the program and how to bring "entrepreneurship" more into our entire school.

Prototype

Recreating a study programme that takes the students' opinions into consideration with the following principles:

- clearer program
- studies are included in the students' schedule
- less compulsory subjects
- more support throughout the year
- each lesson held together will have some component that focuses only on building a strong group identity
- more authentic entrepreneurship content, less theory

Creating a poster to advertise the study programme to new students.

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Test

1 Inviting students to hear about the programme at the end of the first period, with the intention that the new students would have had some time to adjust to their studies and the new school.

2 Ideating the contents with the students to increase their commitment and motivation. We asked them to write down on pieces of paper "the craziest ideas" in terms of what they would like to do, what they were interested in, what they thought they had signed up for.

3 Focusing on building team spirit with various activities. We created a "what unique do I have" flower with the students and placed it on the classroom wall: a sunflower where each part represented something that no-one else in the group had and later on then something that they shared with the person sitting next to them.

4 A visitor from a local bank to talk about managing personal finances and investing.

5 Visiting a local business. With our entrepreneurship education students we are going to visit a small start-up gaming company in January.

We managed to get 10 students to come and hear about the study programme. 5 students decided to continue with the programme. So far the adjustments we have made have paid off, and we seem to have been able to tackle the initial problems we faced with the initial studying module with the help of design thinking and visual learning tools.

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ADULT EDUCATION – PEOPLE AND PLANET WORKSHOP
Crossing Borders
Denmark

How to structure a workshop based on DT and VT methodologies

Target: Students at HF & VUC Fyn Odense City Campus

Number of participants: 1500 students and 33 facilitators

Background: A special school for both people with a challenging background, such as refugees or asylum seekers, or people suffering from a specific condition, such as dyslexia. Crossing Borders was requested to develop a workshop on the topic "people and the planet" that would be able to engage the target audience in a different and more creative way than the traditional unilateral way of teaching.

Goals & motivation: The overall goal of the day was to foster creative and critical thinking to explore the connection between education and sustainability.
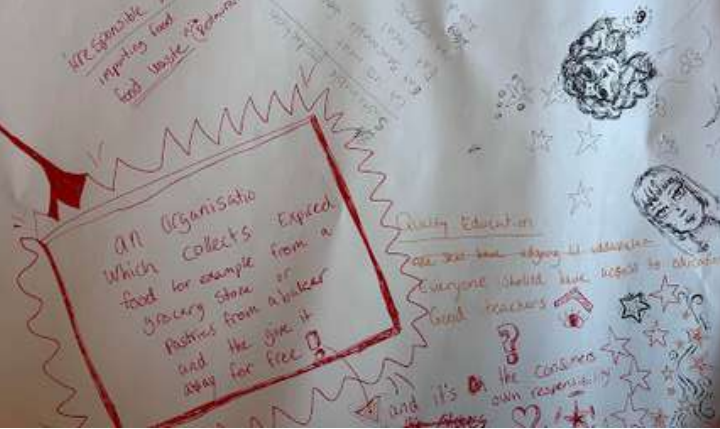
Learning outcomes: Group work proved to be efficient in sparking creativity and imagination, and helped the participants to come up with fresh solutions. The visual tools pushed the participants to use their creativity and enabled a relaxed atmosphere to work in.

The workshop was organised based partly on the Design Thinking methodology, in particular on "empathise" and "ideate", in order to foster curiosity and creativity to deal with the topic of sustainability and respect of nature.

The Sustainable Development Goals (SDGs) 4 (quality education) and 12 (sustainable production and consumption) functioned as the framework for the workshop.

General observations on the training and short explanation of activities:

- Three 60-minute sessions, with 500 students at a time
- The students were divided into 15 groups in 15 rooms, 33-34 students in each group, 2 facilitators per group
- The workshop was inspired by DT and VT but was narrowed down to only 2 stages of DT to fulfil the needs and requests of both the teachers and the students.
- The focus was on Empathise and Ideate because they best fit both the topic of the day "People and the Planet" and the overall goal of the day was to foster creativity and critical thinking, considering the limited time at our disposal.

LESSON PLAN

Introduction
Introducing the facilitators and the topic and the SDGs of the day.

Empathise

The empathise phase was re-adapted in order for the students to investigate the main challenges that the environment is facing in terms of sustainable production and consumption.

In groups of 10, brainstorming about the topics on quality education and sustainability:

- A minimum of 3 criteria/requirements you would choose to describe quality education
- A minimum of 3 criteria/requirements you would choose to describe sustainable production and consumption.
- A few examples of "irresponsible production and consumption" with examples of specific products, companies, services that in their opinions do not respect the SDG number 12.

Choosing (in groups) the problems they want to work on.

The outcome of this stage was generally very positive. For this exercise, all the groups came up with relevant questions. Group work has been proven very efficient to foster critical thinking and avoid getting stuck with creating ideas or criteria.

The only downside was related to the lack of time. For this part they only had 15 minutes, and obviously the exercise could have benefitted from a more extended time-frame. A minimum of 1 hour should be allocated for this exercise to be completed.

Ideate

Working in groups, pick one of the main "unsustainable production and consumption" issues identified, and develop a product, business, method or such to solve their problem. The end product does not have to be realistic, but the idea was to spark students' imagination while ideating their products..

Sketching the solution, with details:

- What's the name of your creation? How does it work? Which colour is it? How does it work?
- Who is your target audience?
- Which education would you and your team need if, one day, you wanted to create and sell your product?

Group presentations.

Reflection
Joint discussion on what they think the purpose of the day was.

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GENERAL OBSERVATIONS

- The workshop effectively served the purpose of showing how DT and VT can be useful and inspirational tools to structure and implement classes or workshops that allow students to learn about topics in a more creative and interactive way.
- Ideally, it would have been beneficial to have more time to go through the other stages. However, when an NGO such as Crossing Borders is requested to facilitate workshops with students from an education institution, they usually only get a couple of hours to implement the activity.
- The exercises would have benefited from a more extended time frame to be completed.
- Always include time for a presentation of the work done to give the exercise meaning and a purpose. It also forces the least engaged students to take the activity seriously if they know they will have to present the result of their work.
- With more time available, it would have been interesting to explore the needs and challenges faced by people within the climate emergency, and develop a product that would address those.
- It is essential for the teacher/facilitator to give the instructions really clearly and step by step in order to avoid confusion on the purpose of the exercise and the overall outcome desired.

Once again, group work proved effective in sparking creativity and imagination. On top of that, asking the participants to be visual and actually draw their invention allowed them to be creative, relaxed and entertained while exploring the issue of sustainability.

The presentations worked really well to foster a feeling of "accomplishment" among the participants: they got to share with their classmates what they had been working on and they did not feel like they had just been wasting time.

THE TEACHER'S ASSESSMENT ON
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work on facts and not assumptions?
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TEACHERS – AN ESCAPE ROOM
Denmark

Training on Visual Thinking and Design Thinking Methodology for teachers of a Danish Efterskole focused on entrepreneurship, with the specific goal of designing an escape room.

Target: Teachers

Number of participants: 12

Background: Teachers of different subjects, from English and Danish to Web Design. The school where they teach is an efterskole: a unique type of Danish voluntary independent residential school for young people between the age of 14 to 18. At an efterskole, students can choose to spend one, two or three years finishing their primary education. The efterskoles are usually focused on a specific area of studies, in this case, the training was conducted in New Nordic Youth Efterskole, a School of Entrepreneurship and Design.

The training with teachers was carried out during 3 days with each session lasting approximately 5 hours. The three sessions were held over a period of 1.5 months which gave the participants time to think of what had been done during the last session and about their project, and to get ready for the next session.

The timetable was dense and full of activities, alternating between presentations from the trainers, energizers, project focused activities, sharing moments and breaks. The activities were selected based on the goal and needs of the step of the training.

Goals & motivation: To learn more on how to apply Visual Thinking and Design Thinking in their daily teaching practice and, also, how to teach it. Also, to have a chance to work together and to design projects for their students together, something that is essential in an innovative school concept as in the NNY. Lastly, to learn tools to let the students design an escape room.

Learning outcomes: It is important to know the target audience to be able to see the problem from their point of view. Also, accepting others' ideas openly and building on them, using visual tools and trying different approaches help generating novel opportunities.

The focus of the activities was:

- Design Thinking – What it is, presenting the different stages and how to approach them
- Energizers – To enter the mindset and to keep the spirit of the group up, by adding fun and playful moments. The energizers could be both activities that would activate the body or activities to train visual thinking. Some energizers were team activities and others were individual ones.
- Project focused activities – Mostly traditional Design Thinking activities that allowed the group to carry on the project they were designing.
- Breaks – Breaks were an essential part of the programme to stop the working and allow the participants to find back energies and not lose motivation.

Training schedule

DAY 1

1 What is Design Thinking?
The history of the practice, how it is used, and presenting the core values of the framework.

2 The project
Escape room – an idea originated from the teachers → how to stay problem-focused when the tool for solution has been defined already?

Empathise

"How could an Escape Room be used to engage students in the learning of some subjects?"

This makes the design process different, since there should be space to challenge assumptions and openness to a large number of solutions to consider instead of already starting with one.

3 Team building
3 groups of 4 people each, to mix competences, subject thoughts and to try to work with colleagues they rarely worked with.

4 Energizer: 3 people and 1 chair

One person was asked to stand on the chair while the other three would surround them. The person in the middle was asked then, for one minute, to simultaneously:

- Copy the movement that the person in front of them was doing.
- Answer easy calculations asked by the person on one side.
- Answer questions related to the colour of some object asked by the person on the other side.
- Change roles after 1 minute.

5 VTT activity: an infographic poster on what an escape room is

- What are the characteristics of an escape room?
- What actors are involved in an escape room?
- What research can you find on escape rooms?
- How have escape rooms been used in educational environments?
- What makes an escape room successful? And what doesn't work?

6 Activity: Create a proto persona

7 Activity: An empathy map

The groups that knew their target better could empathise easier with them, since there was not enough time to actively reach out to users and involve them in this phase.

It is important to actually engage with the target audience to be able to move from assumptions to reality.

Define

8 Activity: Connect the dots

Draw 9 circles (3 per 3 lines) and connect them with 4 straight lines without removing the pen from the paper.

This exercise aimed at reflecting on the insights of the research and connecting the main issues.

9 Reflection on the poster, persona and empathy map

How to connect them? Where do they interface? Which ones are the users' needs that could be addressed by the main elements/characteristics/points highlighted in the use of the escape room in an educational environment?

10 Activity: Point of view

Rephrase the original research question as a problem statement focusing on the point of view of their users, keeping in mind all the insights from the empathise phase.

4 Activity: Crazy8

Pick a cluster from the mindmap, and in 8 minutes try to generate 8 drawings representing ideas that would answer the HMW question of that cluster.
→ Voting one idea for further development.

> Quantity over quality: there are no bad ideas.

DAY 2

Ideate

1 Read and reflect on the results of Day 1 → How Might We...?
To reflect on the problem statement, the groups were asked to convert the problem statement into a "How Might We...?" question.
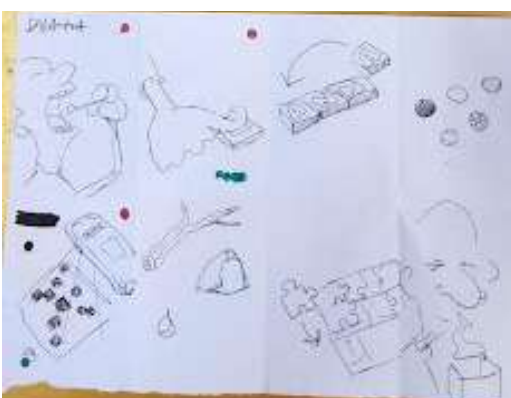Presentation on Ideation.

2 Activity: Collaborative mind map with How Might We -questions
Generating ideas and building on each other's ideas to create idea branches that would reply to their HMW question with many possible solutions. All the ideas generated were then clustered under different themes.
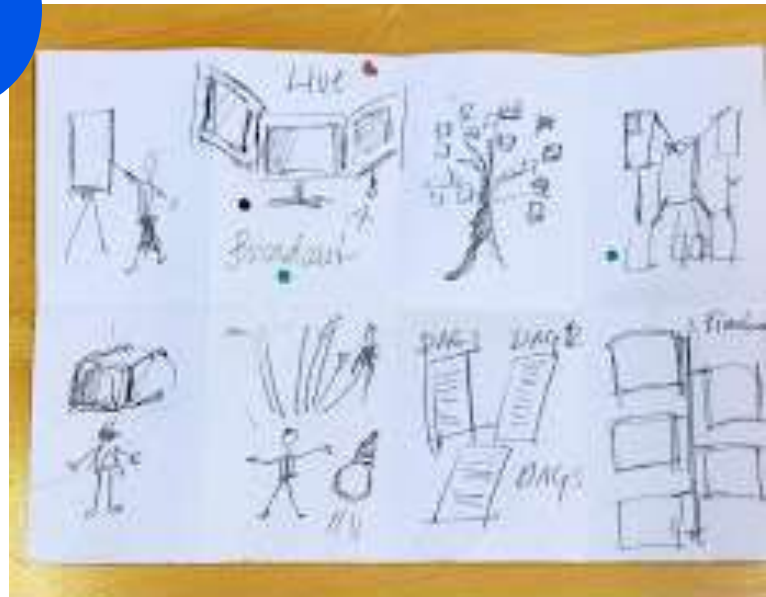
3 6 drawings for 6 circles
On a piece of paper they drew 6 circles and they were asked to draw six different things starting from each circle in one minute.

5 Activity: Yes, and...
In pairs: what to do over the weekend?
Responses:
1 min "No."
1 min "Yes, but..."
1 min "Yes, and..."

6 Activity: Brain writing
Starting from the idea the group had voted for, each group member would write a starting sentence on how to develop the idea and after 30 seconds they would swap the papers and were asked to keep writing on other people's papers by adding on the others' ideas.

7 Activity: A journey map
What steps are there in the interaction with the user in their concept, and which touchpoints need to be developed?

DAY 3

Prototype

A layout on designing prototypes

Developing prototypes
What do they want to develop and test

Test

Testing the prototype within the group and with external participants

Reflection

Reflection on the project and the methodology

GENERAL OBSERVATIONS

- The participants were engaged and excited to use new tools and to work in new teams.
- They were surprised by the amount of ideas they could generate and the impact that trying different approaches and being more visual could have.
- Even though real users couldn't be involved, the participants managed to empathise with their targets and challenge their assumptions in many cases.
- It was difficult for some of the participants not to enter a solution mode from the very beginning.
- **As some of the activities were different from what the participants were used to using in their work, it stirred up feelings of frustration among some of them.**
- **Also, the time was too limited to involve users and do proper user research that would allow a deeper level of understanding of users' needs.**
- At times some of the participants showed a lack of trust in the activities run.
- In the context of a school it might be more difficult to involve users in all the stages of the project as it would be necessary for a properly done user centric design process.

THE TEACHER'S ASSESSMENT ON HOW DID THE TRAINING …

foster teamwork skills?
1. 2. 3. 4. 5. 6. 7. 8. 9. ⭐10.

One of the goals of the school to attend the training was to foster teamwork dynamics between the teachers, and they were very happy with the results.

foster creativity?
1. 2. 3. 4. 5. 6. 7. ⭐8. 9. 10.

Many participants commented that they were surprised on the amount of ideas they could generate and on how they could present them in various ways.

keep a user centred focus?
1. 2. 3. 4. ⭐5. 6. 7. 8. 9. 10.

With the limitation of not being able to include the users in the whole project, especially in the ideation phase the user centred focus was a bit weak.

work on facts and not assumptions?
1. 2. 3. 4. 5. ⭐6. 7. 8. 9. 10.

For the same reason it was difficult to focus on facts, but the participants could quickly challenge their ideas if it was pointed out that they were focusing on assumptions.

TEACHERS – LEARNING TO APPLY DT AND VT Lithuania

Design Thinking and Visual Thinking based problem solving: application in the educational process.

Target: Teachers from different levels and Teach first project

Number of participants: 47

Coaches: Virgita Valiūnaitė, Emilija Urnėžienė, Elzė Vareikytė, Gustė Vaitkevičiūtė, Ramunė Guogytė and Lina Ignatavičiūtė

Background: The attending group composed of 47 teachers altogether. 20 of them participated in the whole training, 10 for the most parts and 17 for some parts. The teachers were from the same schools as the trainers as well as from the Teach First project. They represented different school levels and subjects.

Goals & motivation: To practise Design Thinking Strategies (DTS) and Visual Thinking Techniques (VTT) with the teachers to encourage them to apply and use DTS and VTT in their own classes. Also, the goal was that afterwards teachers could teach the use of DTS and VTT to their students and by this help them to learn and express themselves better.

Learning outcomes: The teachers learnt practical ways in which to enrich their teaching and how to motivate their learners. They also learnt to narrow down and analyse problems and find new ways to come up with solutions. The process also taught them new techniques for teaching and how to patiently stop at each stage of the DT process.

A 2-day hands-on workshop during which the teachers were introduced to the project, its purpose, the challenges it aims to overcome, and the intended audience.

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TRAINING SCHEDULE

DAY 1

Introduction
Getting to know: introduction to the MIRO board
1. "How do you feel today? Answer with stickers or emojis."
2. "If you could have dinner with any person in the history of mankind (alive or dead), who would he/she be? Why? Upload a photo of the person and write "why" on the sticker."
3. "If you could travel to any place in the world, what place would it be? Use the Pen to answer."

Introduction of the project, its aim and the target audience.

Introduction of the programme and DT&VT as the tools.

Empathise

Introduction of the stage and the purpose of it.

Practising empathising with a suggested challenge:

What is the educational challenge you face in your professional life at the moment?

They used **Role Playing** (Questioner – Storyteller – Artist) to visualise the challenges. The groups created Empathy maps to visualise their findings on what was important, what helped or hindered while completing the task

Summary: Why empathise? What are the key factors?

An introduction of a few tools that can be used during the stage.

Define

Introducing the stage

The 4 Ws (Who, What, Where, Why) to practise defining the problem. The tool Storyteller and Listener was used: The Storyteller showed their drawing based on the 4 Ws and described what it represented. The Listener had to listen empathetically and afterwards suggest what other questions might be present in the situation. Afterwards, the roles were swapped.

POV Sentence construction: user - need - insight
The teachers were asked to rephrase the problem in one sentence keeping in mind the sentence construction

USER – NEED – INSIGHT.

Storyteller and Listener revisited, working in threes: The Storyteller read out the definitions for the problem and the Listeners assessed whether the statements were in line with the three core principles of problem definition (human-centred, broad enough for creative freedom and narrow enough to be possible to implement) and helped with their suggestions / ideas. Again, the roles were swapped.

Summary: "What to put into knowledge luggage":

- Let's dig deep into the research – let's define a problem / challenge as clearly as possible.
- Let's define the problem in a human-centred way.
- Let's leave freedom for creativity when defining the problem.
- Let's consider if the problem still remains achievable.
- (And the most important) Let's stay in the definition stage – without looking for the ideas / solutions – as long as needed to truly understand our problem.

Ideate

Introducing the stage
- what is the ideation process (Generate as many ideas as possible – Rethink the ideas – Choose the best, most innovative idea);
- what are the benefits of ideation (Meeting the User's Needs; Potential for Innovations; Unexpected/New solutions; Diverse result; Possibility of choice)
- what kind of ideas can be created in order to solve the defined problem (Product – tangible object; Experience – interactive product; Service; System).

Visual tool: Circle? Or something more?
Draw as many objects as you can in 1 minute.
Completed twice.
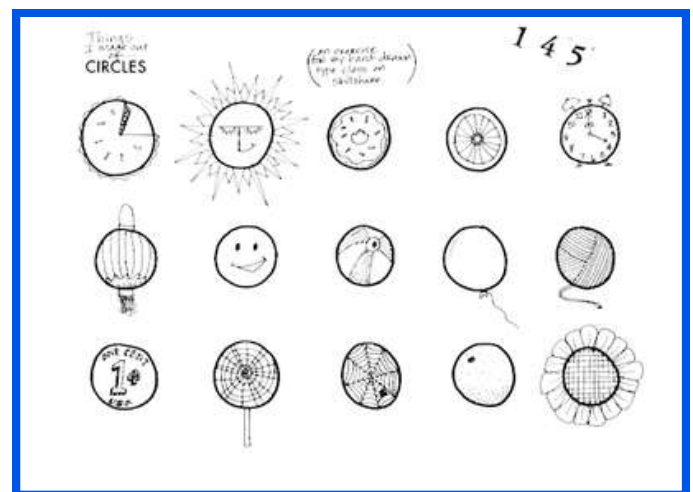
Reflection on the 2 rounds – what was different on the second round?

Visual tool: 8 squares (How can we…? What if…? If I were almighty… If I were a child… And in nature it is like this… Colours… Shapes… The worst idea…)
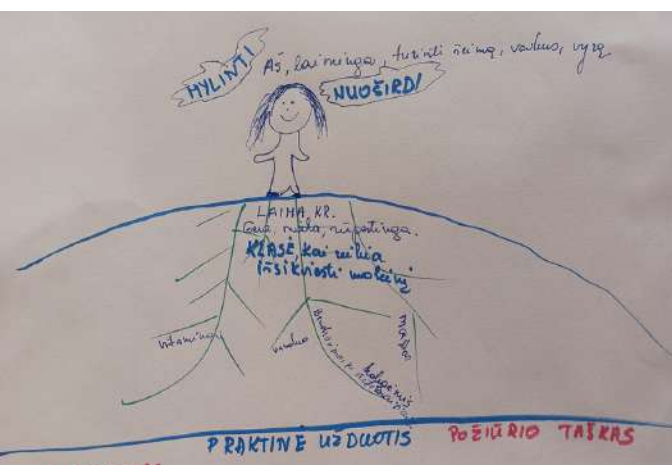
Group discussion: sharing the squares
While one group member described the defined problem and what they had drawn in each of the eight squares, the others suggested what solution would be appropriate to solve the problem, how the needs of the "user" could be met by this solution, and how the solution could be visualised. The goal was to find an idea for a solution together.

Sketching the problem taking into account the discussion with their group and the suggestions from the team members. The teachers were asked to share their sketches, discoveries in problem solving and remaining issues with the group.

Reflection

Reflection map
The 1st day was wrapped up with the participants' personal reflections with a visual tool Reflection Map.

DAY 2

Theory
From practice to theory – linking the practised things from the first day with the theory of DT and VT.

Experiences from other countries: how DT has been used in other schools around the world, how it has been applied and what it has to give to curricula, spaces, processes, tools and systems.

The basics of Visual Thinking to help visualise thoughts, feelings and ideas.

Prototype

Introducing the stage and how it helps make your ideas tangible and enables you to quickly check if the ideas work or not.

Origami technique - Love to myself

Creating a prototype with any material at hand
The mostly used raw materials of prototyping were introduced:

©Pixabay.com

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Some problems defined by teachers	Ideas / solutions how to solve defined problems	Prototypes
To help children with autism spectrum disorder stay at school or classroom. Animals help children to calm down. How to bring a pet (dog/cat) to school?	To bring an animal (dog/cat) to a space especially created for the child (by separating a part of the classroom) where social partners from animal shelters can bring animals.	
To help children with autism spectrum disorder stay at school or classroom. To be alone/engage with favourite activities for some short time helps children to calm down or concentrate. How to arrange it?	To create a separate space for the children with their favourite activities and games.	
	To create a separate space for children with their favourite activities and games (the same problem – another teacher's prototype)	
How to encourage engagement while working in a team?	To create a space where students can sit around the table, work on tablets on a co-working platform (e.g. MIRO) and simultaneously see the joint outcome and each team member's input on an interactive board.	
How to give negative feedback to a pupil?	To keep balance between positive and "to be improved" performance.	
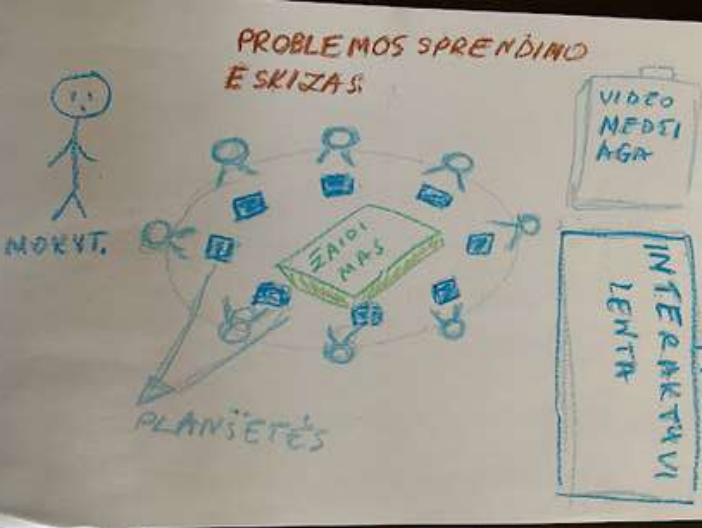
Test

Introducing the stage and its importance

Group work: presenting the prototypes, giving and receiving feedback.

The teachers were divided into groups according to the similarity of their problems in order to test each other's prototypes – each group member presented their own prototype and gathered feedback from their group members on what might work and what could be improved.

Reflection
The 2nd day was wrapped up with personal reflections. The teachers reflected on what they would take away from the two training days. A visual tool Reflection Hand was used for this purpose.

GENERAL OBSERVATIONS

- The training gave the teachers practical ways on how to enrich learning, engage their students and motivate them with visual tools.
- They learnt to look at problem solving from different perspectives by narrowing the problem down, making it concrete and coming up with ideas for the solution.
- The training gave them tools to analyse the problem from different angles with an open mind and leave space for creativity.
- The trainers noticed that teaching the process helped them learn new techniques when creating the contents and how to go through the process step by step with patiently stopping at each stage and focusing on important points.
- They also discovered the importance of passing their expertise to others when aiming at contributing to improve education.

TEACHER TRAINING – IDENTIFYING PROBLEMS IN EDUCATION
Noored Kooli (Teach for All) Estonia

Training on Design Thinking and Visual Thinking to Teach for All (Estonia)

Target: Team members of the organisation, alumni and participants of the programme

No. of participants: 24

Background: The participants all impact the education system. All of them are involved in education, some of them lead the Teach for all organisation and work for it, and others are teachers or working in high level positions in their schools.

Goals & motivation: The participants had heard a lot about DT and its effectiveness and hoped to solve problems in education by using these methods.

Learning outcomes: The process fostered learner centred and team learning elements in education. The participants also noticed that the root of a problem usually lay elsewhere than they had originally thought which helped them towards more effective problem solutions.

The training was carried out over 4 training sessions with a focus on explaining and exemplifying the different stages to the participants for them to use it effectively.

The training utilised teamwork and sharing as a tool in all the different stages.

Compared to the training for trainers, more structure had to be provided for the training to fully clarify the different stages of DT.

TRAINING SCHEDULE

DAY 1

Warm-up
Pitch yourself in 160 characters.
Draw yourself.

Framing the project
What is Design Thinking?
Applying DT in context.

60

Empathise

Group discussion: the points that were disturbing them, the concerns they had and the needs at that moment that needed to be fulfilled.

Discussion in a big sharing circle and identifying possibilities for cooperation between the participants.

Homework: What do I need to learn more in order to understand the problems better?

Sharing circle: Findings and conclusions

DAY 2

Warm-up
Energizer

Define

Mind-mapping what has been learnt to reflect whether they now had enough information to understand the concept well enough. The participants then filled in the chart to reflect the situation through their senses and feelings.
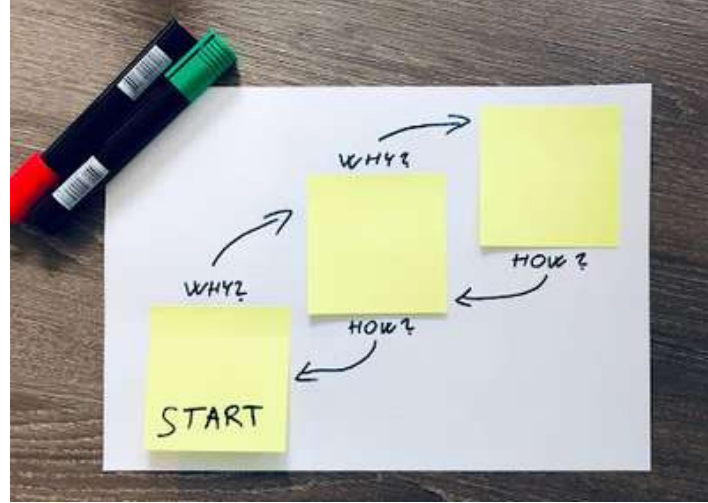
What is defining in DT? (Youtube video)

Exercise: Point of View to identify whose problem it actually was.

Exercise: Turning the problems into How Might We questions in order to discover how to approach the problems.

Exercise: The 5 Whys to get to the roots of the problems.

Sharing circle: Findings and conclusions

DAY 3

Warm-up
Where are we at? Reflecting whether they had to revisit the previous stages for any clarification or further definition or if they still agreed on what had been done and could carry on to ideate how to solve the problems.

Ideate

Introduction to the methodology by presenting the participants different methods for the ideation process and encouraging them to try out a few of the methods they found interesting and fit for themselves.

How to ideate effectively: an introduction of ideation tools and choosing 3 best ones to be used in groups

Sharing circle: Findings and conclusions, writing down the definitions for the next steps.

Many participants wanted to bring in their own experiences instead of focusing on the users' experiences and, thus, were struggling to keep an open mind to various experiences.

DAY 4

Prototype

The 'how to'

Creating first prototypes without overthinking whether they would work or not. They had to be reminded of the end user they were building the prototypes for.

They were instructed to try different methods, such as sketching and diagrams or storyboarding.
They were also given feedback by others.

If necessary, they built a new prototype if they noticed the first one did not work out.

Test

The 'how to'

Planning the next steps on implementing the prototype and creating a backup plan on how to move forward with their testing if they would fall behind or feel like giving up.

They were asked to set specific steps and dates in order to actually forward the testing and to think of the motivation that would help them keep going.

GENERAL OBSERVATIONS

- Also, the participants had to be helped more to set clear goals for themselves.
- The participants strongly felt that they wanted more framework to operate with initially in order to understand the concept and its possibilities in learning.
- As the participants were mostly facing the same issues, they were able to help each other with additional ideas.
- With the help of the tools they were also throughout the process able to clarify the problems more easily and set specific and measurable action steps to achieve their desired outcomes faster.

- When the participants were able to try out the different methodologies first individually and then in groups, they felt that the methodology was very effective and functional. → Learner centred and team learning elements.
- The participants often noticed that the root of a problem often lay elsewhere than they had initially thought which helped them work towards more effective solutions.

THE TEACHER'S ASSESSMENT ON
HOW DID THE TRAINING …

foster teamwork skills?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

Teamwork was something that the participants asked for a lot, and they also gave feedback that it was very helpful for them.

foster creativity?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

The participants were able to think outside of the box with the help of different tools used in the training and came up with solutions that they had never thought of – which surprised them a lot.

keep a user centred focus?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

The participants' attention had to be drawn back to the users several times as they kept mirroring their inner world with the outer world.

work on facts and not assumptions?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

The participants struggled with staying with the facts. There were many cognitive distortions and the participants relied heavily on emotional reasoning (I feel like that so therefore it is like this). But with the help of different methods it was possible to tone the emotions down.

YOUTH WORKERS - SOCIAL ACTIONS FOR THE YOUTH
Denmark

Training on Design Thinking Methodology as a tool to create Social Actions for youth to address problems and challenges raised by COVID-19 isolation.

Target: Youth workers

Number of participants: 8

Background: The attending group composed of 8 youth workers aged between 20 and 30 with international background, but living and working in Denmark, Copenhagen. All the participants are involved in NGO work as youth workers, where they frequently are in touch with local youth, and work to address their needs.

Goals & motivation: To learn about new methodologies that would allow the youth to take ownership of finding different solutions to the various problems and challenges brought about by 2 years of isolation due to the pandemic. They felt the urge to learn new techniques that would allow them, and the young people they are in touch with, to identify, define and cope with a variety of problems that official institutions have lacked to address during the COVID-19 times.

Learning outcomes: The youth workers created a series of events known as "The Everything Social Club", which is still up and running now.

The training with youth workers was carried out during 3 days with each session lasting approximately 3.5 hours.

A series of different activities were planned both to introduce the participants to Design Thinking as a tool to be applied within a NGO context and to inspire them on different types of social actions.

Before the first session, the participants had been asked to do some desk research on the main challenges that COVID-19 and isolation brought upon the local Danish youth. The participants had around 1 week to research and write down the main challenges they could find according to national surveys, studies and research already carried out in the country and available on the internet. The participants were also asked to conduct interviews and/or surveys among the youngsters they are in touch with to find out about their specific challenges, their needs, feelings, emotions, etc.

TRAINING SCHEDULE

DAY 1

Team building
Name a game with a ball
Stand in a circle.
1. Throw the ball to someone and say your name
2. Throw the ball and say the person's name who you're throwing the ball to
3. Same as b) but with 2 balls

Speed dating
The group stands in 2 lines, with participants standing facing each other. Each couple will have 2 minutes to ask each other questions.

A reflection round after the speed dating

Framing the project
What is "Creative Digital Visualization for the Development of Design Thinking Strategies among students and youth projects"?

Rules of the training

Presentation on Design Thinking:
what is it and how will we use it in this training?

> How can we help international young people to feel integrated in their local Danish community after COVID-19 isolation?

Empathise

Sharing findings of their local research

Activity: **Create a proto-persona** based on the information collected before the training. The post-pandemic challenges were based on the interests and needs of the youth living in Copenhagen:

- a lack of sense of community
- a lack of skills to integrate again with peers and society
- a lack of support for the youth to share their emotions and problems.

Create a proto-persona

Define

The main challenges identified during the empathise phase were written on pieces of paper and distributed on the floor. The participants were asked to form groups by standing next to the challenge that, according to their research, was the most pressuring, relevant or urgent to be addressed.

Activity: A problem tree

On large pieces of paper, the groups were asked to draw a tree. The trunk of the tree represented the chosen problem, the roots were the causes of the problem, and the branches were the consequences for the youth of the problem.

Forming "action groups" by selecting the "branch" or consequence that, according to their research, was the one afflicting the target group most.

The activity helped the participants to visualise the problem and break it down into more concrete parts. Also dividing the participants into smaller groups for the activity allowed them to get to know each other better.

On the other hand, the activity might have pushed the participants to use their opinions and assumptions as consequences of the problems instead of basing their Problem Tree only on actual data.

DAY 2

The instructions:

- Go back to your groups that you drew the tree with. Make a group statue to represent this problem. You can use any object you find in the room. Form them using your bodies and don't move or speak. Remember your positions! (10 minutes)
- Each group presents the statue (group by group), the others give titles for the statues. (5 minutes)
- Create another statue that shows some kind of a solution to this problem. (5 minutes)
- Now re-create your first statue and you will have 10 seconds to change into the 2nd statue in slow motion, from the problem to the solution. (5 minutes)
- Reflection – how was it? (5 minutes)

For this exercise it is important to explain that the "potential solution to the problem" represented in the second phase of the exercise is only a part of the game. This is not necessarily the actual solution or prototype that the participants will have to create.

Define

Activity: Statue for change
This exercise is really functional not only as a form of an icebreaker and team building, but also to spark creativity and visualise in a dynamic way the problem that the participants would like to address or solve. It also fosters creativity and a playful and relaxed environment.

Activity: Point of view

The participants were asked to reflect on the information and data they had collected during the empathise stage and to rephrase their findings in a goal-oriented form. Your POV should be an actionable problem statement that will drive the rest of your design work.

This exercise worked particularly well to redefine the problem in a more "user and goal" oriented way. The participants needed to be reminded frequently not to enter a solution-mode and write statements based already on a solution but only on the users' needs.

> Make sure to give the instructions very clearly, together with practical examples to guide the define process.

As a result, the participants created a variety of problem statements based on the users' needs. On top of that, combining the define stage with ice-breakers and more interactive exercises, such as the Statue of Change, reinforced a very strong team-building feeling. Participants were feeling very comfortable working with each other, sharing their ideas, concerns or even doubts.

Ideate

Activity: Idea fair - finding possible actions to address the identified issues

> Based on your definition or problem statement, brainstorm on possible actions that would address or contribute to the issue you have identified.

The instructions:

> - Each participant is given a template (title / short description / target group – optional / aim) to be filled in with all the ideas on how to solve the problem. Give a short explanation, you don't need to provide too many details at this stage. Participants create a template for each action they chose to work on. (20 minutes)
> - Presentation of the action: each participant has 1 minute to explain their ideas of possible social actions/ solutions to the problem. (10 minutes)
> - Voting for the actions: the templates are put on the floor. Each participant has 2 votes to give to the 2 social actions they would like to work on or believe are feasible to perform. (10 minutes)"

Keeping a tight schedule during the different parts of the exercise also helped participants not get stuck with details but keep a creative flow.

> However, having only 1 minute to present each idea might have been too short. Considering that not all the participants were English native speakers, some of them struggled to illustrate and express themselves as they had wanted and this penalised the idea they had thought of.

The idea selected involved creating a series of events to build community during which the local youth could feel empowered, connect with others in a similar situation, and rediscover themselves after 2 years of isolation.

The participants were very much constrained by "feasibility". They picked the idea that was easiest for them to realise, in terms of materials, resources and time.

Prototype

**Activity: Social action fair** to prepare a plan of the actions to be implemented:

- Name of their prototype/action
- Aim/goal
- Detailed description of the overall activity
- Steps necessary to implement the prototype/action
- List of materials, resources, etc.
- Potential risks
- Back-up plan to cope with potential risks
- Task division and responsibilities.

Having a set time-frame for the prototyping phase carried out during the training allowed the participants to be concrete and straight to the point, and to actually create a feasible action plan for the upcoming weeks. Giving the participants clear instructions in the form of bullet points also allowed them to use time efficiently.

Some of the participants were more involved in the training than others during this phase, especially when it came to the division of tasks.

The facilitators should make sure that everyone is equally involved in the definition and creation of the prototype, not only the person or people who thought of the concept in the first place.

The coaches and facilitators should make sure that everyone feels entitled to take ownership of the prototyping stage, and contributes to the definition of the product.
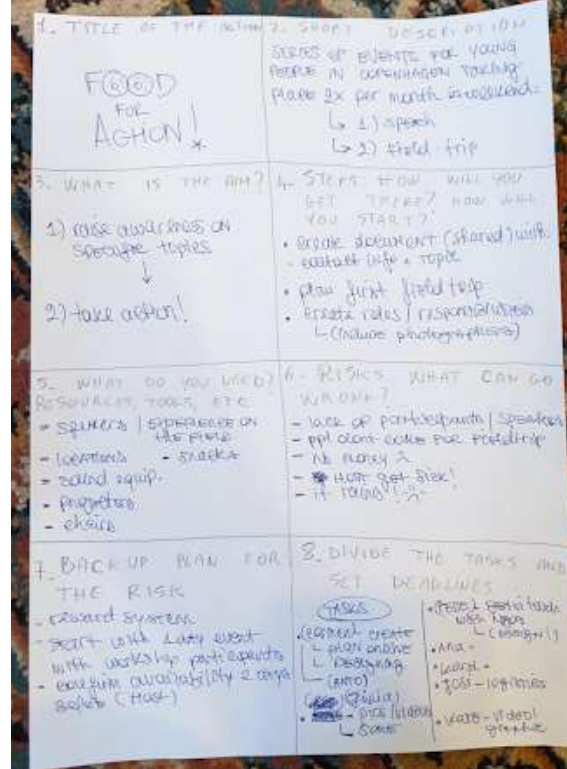
DAY 3

Defining the details of the Social action fair
The participants created a prototype called "social action" activity which was divided into 2 parts:

1. A field trip done in collaboration with a local NGO → this experience would allow the youth to connect with one another, find common interests, and gain a sense of ownership and empowerment by doing a concrete experience helpful for their local communities;
2. A knowledge exchange event: a story-telling, community building experience aiming at creating a safe space where the youth is free to express their concerns, fears, challenges together with others in their same situation and find comfort and help in each other.

Reflection activity: A Suitcase - what to take away and what to leave behind

Test

The participants were free to arrange and organise the testing according to their availability and preferences.

The testing happened outside the training. Thus, the participants were empowered and took ownership of the project, as well as the DTS methodologies. This fostered even further the feeling of belonging and team building dynamics. However, this stage, having almost no supervision, cannot be assessed with precision.

The testing of the 2 parts of the social action was carried out only within the members of the group before a final decision on the product to be implemented.

Firstly, the testing of the knowledge exchange event was carried out at Crossing Borders' offices. As a result, it was noticed that the schedule and the modality of the event needed redefining, and the dissemination and advertisement strategies needed to be more concrete in order to be more efficient.

Secondly, the testing of the field trip was carried out with a local NGO named MADBOX which resulted in redefining the action plan and division of tasks, as well as a more detailed mapping of potential NGO partners in the area.

When there's enough time available to conduct research on the users' needs, it reduces the risk of falling into a working mode where participants ideate solutions based on what they think rather than facts.

The overall result was the creation of a series of events known as "The Everything Social Club", which is still up and running now.

GENERAL OBSERVATIONS

- The task given to them in advance would have required an in-person introduction to DT methodologies and a better reasoning for the purpose of the task.
- Most of the participants had carried out the interviews/surveys only with their acquaintances, making it questionable if the results were truly generalizable to the wider population.
- Going through the different activities together and having clear time-frames, instructions and goals also helped dividing the tasks and created a sense of responsibility among the participants.
- The empathise phase was shorter than what it would usually require. This definitely had an impact on the final product. In this case, for example, the prototype mainly addressed the needs of young internationals living in Copenhagen, rather than the local youth at large.
- Since the beginning of the training, participants already knew that the final result was going to be some sort of social action, rather than a more "materialistic" product. However, we avoided entering a "solution mode" by letting the participants define the challenges, format and modalities of the social action they prototyped.
- The international background of the youth workers caused a language problem as they do not speak Danish. Therefore, they mainly engaged only with other members of the international community.

THE TEACHER'S ASSESSMENT ON
HOW DID THE TRAINING ...

foster teamwork skills?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

- The training was really useful in bringing people with similar backgrounds, knowledge and passions together, and it fostered strong team building dynamics.

keep a user centred focus?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

- Although participants tried to keep the users at the centre of the activities, it was challenging when not enough time was dedicated to the Empathise stage.

foster creativity?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

- Applying DT and VT methodologies served well the purpose of sparking creativity and thinking outside of the box.
- However, limited resources and time, which are frequent in the NGOs' context, also function as a limitation to the possible solutions to be prototyped.

work on facts and not assumptions?
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

- Especially when the people involved work with the youth frequently, they might believe they already know everything about the users and therefore their assumptions might not be correct.
- The activities carried out, such as the proto-personas, served well the purpose to showcase the difference between "working on facts" and
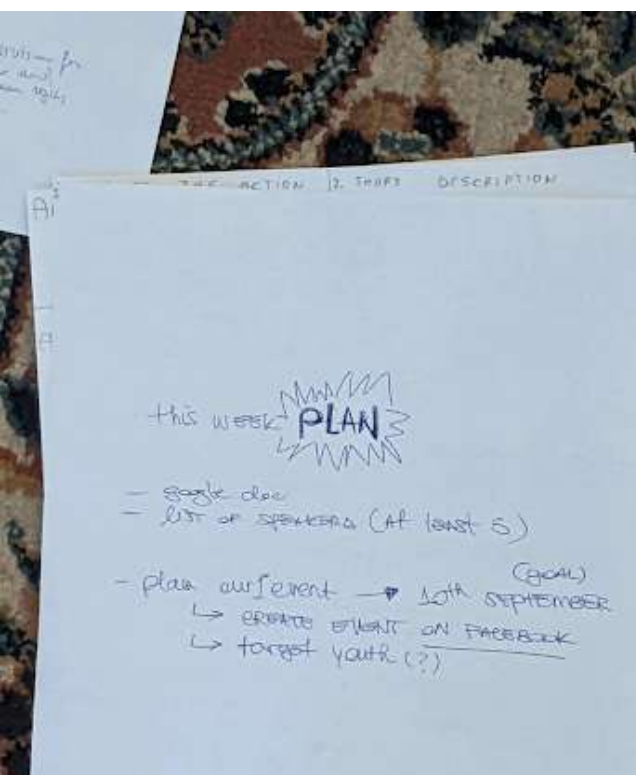
The training effectively introduced a new approach to youth workers, giving them a first chance to familiarise themselves with a methodology that involves extensive research on the target group.

LESSON PLANS

When it comes to carrying out a successful process, thorough planning is the key. You might want to teach a certain area or topic in your subject or you might already have a research question in your head, but before you can start the process, you need to plan all the stages: which tools you want to use and how you will introduce them.

It is also wise to start your lessons from the visual tools so the participants can practise using them before they need to use them during the stages and won't thus get stuck with the idea of not knowing how to draw or how to express themselves visually.

Despite the practice, the participants might feel awkward at first with visual expressions but as the process will be carried out the second time, they are already familiar with each stage and might be able to utilise the tools more effectively.

The templates below have been created for secondary and basic education but can easily be adapted to other purposes as well.

Also, if you think you need something more in your plans, you can use the templates as a basis for your planning work and build plans that work best for you.

The plan for secondary education consists of

7 X 75-minute lessons

during which there are 2 lessons reserved for the introduction of visual tools and 5 lessons to go through the stages of Design Thinking. The whole package is supposed to be iterated 3 times, so altogether you will create a plan for 21 lessons.

The plan for basic education has

12 X 45-minute lessons

during which both the visual tools are being presented and the different stages are followed through to complete the process.

You can adapt the length of your process according to your resources and needs.

How to use the templates

In the spirit of Design Thinking,

we are not going to provide you with complete lesson plans.

Instead, we have introduced you to the methodology by explaining the what and how of Design Thinking Stages and Visual Thinking Tools, and exemplified their implementation with the case studies presented above.

The questions will guide you to choose the correct tools for the different stages so that you will have everything ready before starting the process. You can always go back to our case studies to see which tools have been used during the different stages and how the stages were implemented in these cases.

To use the templates, we provide you some hints on how to make your plan work beautifully so that you can enjoy the experience.

You can also learn about the challenges faced during the stages and find your way around them. On our website you can also find a list of tools you can use during your Design Thinking process.

To fill in the templates, you can use the following questions as guidance:

Topic:

What is the topic? Why is it important? How can DT stages and visual thinking help learning?

Empathise:
Which tool can I use to understand what the problem is?

Selected tools
1 Which tool can I use to understand why I want to solve the problem?
2 Which tool can I use to understand the reasons behind the problem?
3 Which tool can I use to understand the feelings arising from the problem?
4 How have others solved a similar problem?

Define:
What is the target group?

Selected tools
1 Which tool helps to define whose problem we are solving?
2 Which tool helps us to define what the problem really is?
3 What needs to be changed in the future?
4 How do we measure the change?

Ideate:

What ideas are there for possible solutions?

Selected tools
1 Which tool helps to get creativity flowing?
2 How do we keep focus on our target?
3 How to narrow down to the most feasible ideas?

Prototype:

How to visualise the selected solution?

Selected tools
1 What materials do we need for building our prototypes?
2 What is the best way to present the prototypes and get feedback?
3 How to best utilise the feedback and modify the prototype?

Test:

Does the prototype work?

Selected tools
1 How do we test our prototypes?
2 What resources do we need?
3 How do we measure the effectiveness of our testing?
4 How do we collect feedback?
5 What's next?

Feedback:

Collecting feedback from the whole process from the participants. How to get their honest opinions? How to reflect on what was done?

Visual tools:
Which visual thinking tools are needed during the 5 stages?

Presenting visual thinking:

- What is it?
- Why is it useful?
- What materials do you need?
- Do you want to teach theory?
- Do you have a short video?
- What do you need to teach the visual tools?
- Do you need to make preparations?
- What kind of practice do the participants need?
- Which techniques should be taught?

Write down everything so it will be easier for you to implement. Also plan how you are going to teach them.

Now it's your turn. Have fun!

What is the topic? Why is it important? How can DT stages and visual thinking help learning?

Which visual thinking tools need to be practised?

EMPATHISE TOOLS

- challenge
- observations
- background
- visualise current situation
- reach out

DEFINE TOOLS

- what did we find out?
- visualise desired situation
- for whom are we solving the problem?
- organise the information
- what is the measurement?

IDEATE TOOLS

- different brainstorming tools
- go to a different environment
- the worst ideas brainstorming
- do something else
- focus and select

PROTOTYPE TOOLS

- storyboard
- build a 3d model
- drawing
- use random objects
- storytelling

TEST TOOLS

- questions
- feedback
- stop
- start
- continue

TOOL, WE WILL USE

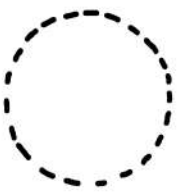**TOOL, WE WILL USE**

TOOL, WE WILL USE

TOOL, WE WILL USE

TOOL, WE WILL USE

What went well throughout all five stages?
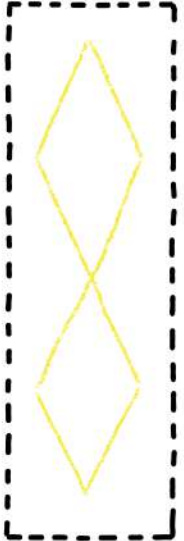
What we could do differently next time?
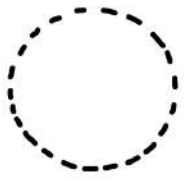
WHERE ARE WE AT THE MOMENT?
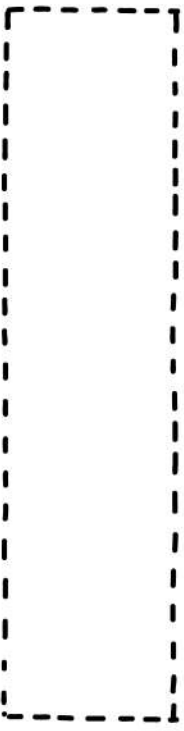
WHERE DO WE WANT TO GET TODAY? HOW DO WE GET THERE?

HOW WILL WE KNOW WE ARE THERE?