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Women Stem-up for GOOD Program

Topic 1 - Gender in STEM

Session 1 – Understanding gender bias

Grant agreement: 2022-1-SE01-KA220-HED-000086239

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Topic 1: Gender in STEM

1. **Understanding Gender Bias** : Examining the societal & institutional barriers that women face in STEM and how to navigate them with confidence and resilience.
2. **Gender Aware Mindset:** how to cultivate a gender aware mindset as an essential foundation to inclusivity and equity in STEM
3. **Empathy for inclusion & social impact:** empathy-based methodologies as a foundation for developing solutions to social problems and contributing to gender equality.
4. **Design Thinking for Gender-Inclusive Solutions**: Applying design thinking principles to create products and services that address the needs of women and marginalized groups, that could result in building gender-neutral STEM products.
5. **Hands-on project**: Choose a gender issue they've experienced in STEM and, in small groups, propose a solution based on the learnings from above.

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Learning objectives

- Understanding stereotypes
- Awareness of our own stereotypes
- Transforming stereotypes

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EXERCISE: Where do you stand?

List of statements:

- People should go for the jobs they think they would be good at and are interested in.
- Maths is really difficult.
- Your gender should have no impact on your subject choices.
- I would always encourage my peers to do whatever subjects they want.
- Nursing is a profession best suited to women.
- Males and females are equal
- Boys are better than girls at Maths.
- Girls do better in school than boys.
- Design Technology is a “boys” subject.
- Being the only male/female in a class would put me off choosing that subject.
- Boys are better at computers than girls.

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Stereotypes and prejudices about women in STEM

- Gender disparity in STEM education is a complex and multifactorial phenomenon. According to a 2022 UNESCO report, less than 30 percent of researchers worldwide are women, and there are countries where girls represent only 3 percent of students enrolled in engineering and computer technology programs.
  - These numbers are a reflection of how cultural biases and stereotypes influence career choice in young women.
- Prejudices and stereotypes about women in STEM disciplines represent one of the biggest barriers to their participation. These stereotypes can lead to an educational environment in which girls do not feel supported or encouraged to pursue interests in these areas, limiting their potential and diversity in the STEM field.

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What is your definition of “Stereotype" ?

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What is the definition of “Stereotype"?

Widely-held

Thing

Fixed

Ideas

Images

Over-simplified

Belief

Person

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Oxford's definition of “Stereotype”:

ster·e·o·type

/ˈsterēəˌtīp/

noun

1. a widely held but fixed and oversimplified image or idea of a particular type of person or thing.
   "the stereotype of the woman as the carer"

   Similar: standard/conventional image | received idea | cliché | hackneyed idea

2. a relief printing plate cast in a mold made from composed type or an original plate.

verb

view or represent as a stereotype.
"the city is too easily stereotyped as an industrial wasteland"

Similar: typecast | pigeonhole | conventionalize | standardize | categorize

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Implications of what a Stereotype is:

- **Widely held:** *Impact of stereotypes is large, far-reaching and ever-present.*
- **Fixed:** *Images/ideas are intractable, and presumably, difficult to change.*
- **Oversimplified:** *Images/ideas are generic, and do not apply to everyone.*
- **Image / Idea:** *Does not necessarily reflect reality; it's rather a perception **

- **Is this true?*

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Stereotypes can apply to:

- PEOPLE:
- Age
- Neurological Ability
- Physical Ability
- Race
- Sex (versus Gender)
- Gender and Gender Identity
- Belief Systems
- Sexual Orientation
- ….What else?

- **THINGS**:
- Nations
- Religions
- Fields of Study/Work
- Food
- …
- ***What else?***

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Key questions on Stereotypes:

- How are stereotypes PERPETUATED?
- Are stereotypes HARMFUL?
- Are stereotypes USEFUL?
- Can we promote POSITIVE stereotypes?
- If so, how can we PROMOTE/ use stereotypes in a positive way?

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How are Stereotypes perpetuated?

?

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How are Stereotypes perpetuated?

Art

Advertising

Television

Religion

Family

Community

Movies

Culture

Children’s Books

Ritual

Language

News Coverage

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Gender stereotypes affect us early-on

Cherie Blair Foundation for women study (November 2021) researched when women were started to be exposed to gender stereotypes:

- 6% experienced it before age 3
- 28% of respondents experienced their first gender stereotype **aged 3 to 7**
- 27% experienced it **aged 8 -12**
- 15% aged 13 - 17
- 15% aged 18 - 25
- 2% aged 26 - 34

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Source of Gender stereotypes

Sources of gender stereotypes experienced in childhood:

- 75% of respondents reported experiencing gender stereotype by **family** members
- 49% by **media** such as TV programs, cartoons, books, radio programmes
- 48% by **teachers** or other staff in educational settings or materials
- 37% **advertising**
- 25% religious leader or representative of faith

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Types of Gender stereotypes

Most common gender stereotypes experienced in childhood by the respondents:

- 41% related to the behaviour or **division of domestic labour** *(women should take care or kids)*
- 17%related to **personality traits** (*i.e girls are not brave, boys are competitive)*
- 11% related to **physical appearances**
- 11% related to leadership and **decision making** *(men make better leaders)*
- 9% related to educational/ **occupational choice** *(men should be soldiers)*

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Advertising language for boy's toys

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Advertising language for girl's toys

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https://thesocietypages.org/

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How can MEDIA perpetuate Stereotypes?

Think about advertisements, movies, video games, books, news coverage…
as concerns gender, race, physical ability, sexual orientation, ethnicity, etc.

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Impact of Gendered Stereotypes in Media

- Increased aggressiveness among boys *(Geena Davis Institute of Gender in Media)*
- Confidence gap:
  - Females are stereotyped as being less confident, less capable, etc., and begin to embody these stereotypes (i.e. *not good at math)*
  - Girls are aware they are valued less in society than boys by the age of SIX years old
- The **"CSI Effect"** (2011) - impact of fictional gender stereotypes: *Percentage of female college students who enrolled in Forensic Science studies in Norway increased because of the* Crime Scene Investigation *television series which featured* ***women in leading roles***
- Stereotyped behaviour also originates with ***women toward women***
  - On **Twitter** (2022), the majority of gender-based stereotypes directed toward women originate with other women, i.e. from accounts whose owner identifies as "female"

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Are Stereotypes HARMFUL?

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People-focused Stereotypes can have a NEGATIVE impact on…

- Wellbeing: Physical, emotional and psychological health
- Financial independence, self-reliance
- Political, Social and Economic Agency
- Education and Employment Opportunities
- Full self-determination and -actualization for individuals and groups

- What are the **consequences** of this for Society? Our Planet? Fellow creatures?

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Gender stereotypes impacting women as entrepreneurs

- 70% stereotypes have **negatively** affected their work as entrepreneur
- 61% believes gender stereotype impact their **business growth** and affect how seriously they are taken in business (63%)
- 53% believe gender stereotype impact how confident they are in the future of they business and business **profitability** (49%)
- 23% of women entrepreneurs have experience discriminatory remarks and stereotypes while trying to **access for finance**
- They experience intersecting discrimination or stereotypes based on age (37%), social class (29%) and ethnicity (22%)

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Cherie Blair Foundation - Survey Report Exploring the Experiences of Women Entrepreneurs in Low and Middle Income Countries

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Are Stereotypes USEFUL?

Think about: Role models, mentors and people we look up to…
Countries we might be afraid to travel …
Etc.

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People-focused Stereotypes can have a POSITIVE impact on…

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What can be done to promote positive Stereotypes?

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Positive Stereotypes

- Increase ***visibility*** of under-represented peoples and groups in STEM, using both quantitative and qualitative measures
  - Promote **MORE** portrayal of girls and women, people of color, and people with disabilities or other intersecting issues, in *narratives, examples, research studies*….
  - Promote **BETTER** portrayal of these same people - i.e. in non-stereotypical roles, like *swapping gender roles regarding care-giving, leadership*, etc.…
- Increase ***actual participation*** of under-represented peoples and groups in LEADERSHIP and DECISION-MAKING in society, using both quantitative and qualitative measures
  - DIVERSITY Targets: Set objectives for MORE women, people of color, and peoples with other intersecting issues, in public and private leadership roles
  - INCLUSION and EQUITY Targets: Set objectives to ensure *equal opportunities for* decision-making and *equitable* leadership *action* by women, people of color, etc.

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How to make a difference?

- The work to tackle gender stereotypes MUST start with ourselves first.
  - **Self-reflect** and identity the ways in which gender stereotypes shape our own views, actions and engagement with ourselves and other people *(take it as a stepping stone and not as a road block!)*
  - Better understand the **opportunities** we each have to promote gender equality and tackle gender stereotypes both in personal and professional life for ourselves and others
  - Create **concrete personal commitments** on tackling gender stereotypes, i.e. by questioning the gendered division of labour in your family, workplace or being a voice in our homes, work place and communities to push for concrete actions

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How can you PERSONALLY promote positive Stereotypes?

?

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20’

EXERCISE: Changing stereotypes

- Get into groups of 2-3
- Draw a woman in STEM and include various social stereotypes related to women (10 min)
- Add ways to break these stereotypes or what solutions you propose to improve women's lives in relation to these stereotypes. (10 min)

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QUESTIONS AND END OF SESSION

What are you taking away from this session?

Describe how you feel in one word.

Thank You!

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Women Stem-up for GOOD Program

Topic 1 - Gender in STEM

Session 2 – Gender Aware Mindset

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STIMMULI for social change

NTNU Norwegian University of Science and Technology

DIGITAL LEADERSHIP INSTITUTE

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Learning objectives

- Understanding mindset
- Awareness of our own mindset & why it matters
- Creating gender aware mindset

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Mindset

A **filter** through which we **view life**; based on our beliefs about how the world works and shaped by our experiences.

As our mindsets get activated—by a memory, a situation you find yourself in, or a remark someone makes—it sets off a cascade of thoughts, emotions, and goals that influence **how** you respond to life.

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Conscious & unconscious

Our mindset is shaped by experiences, beliefs and reactions accumulated over time.

Identifying triggers and patterns helps to **uncover habitual responses** and underlying **beliefs** that influences our mindset and our behaviours.

The need: understand how our mindset impacts our decision making and approach to challenges.

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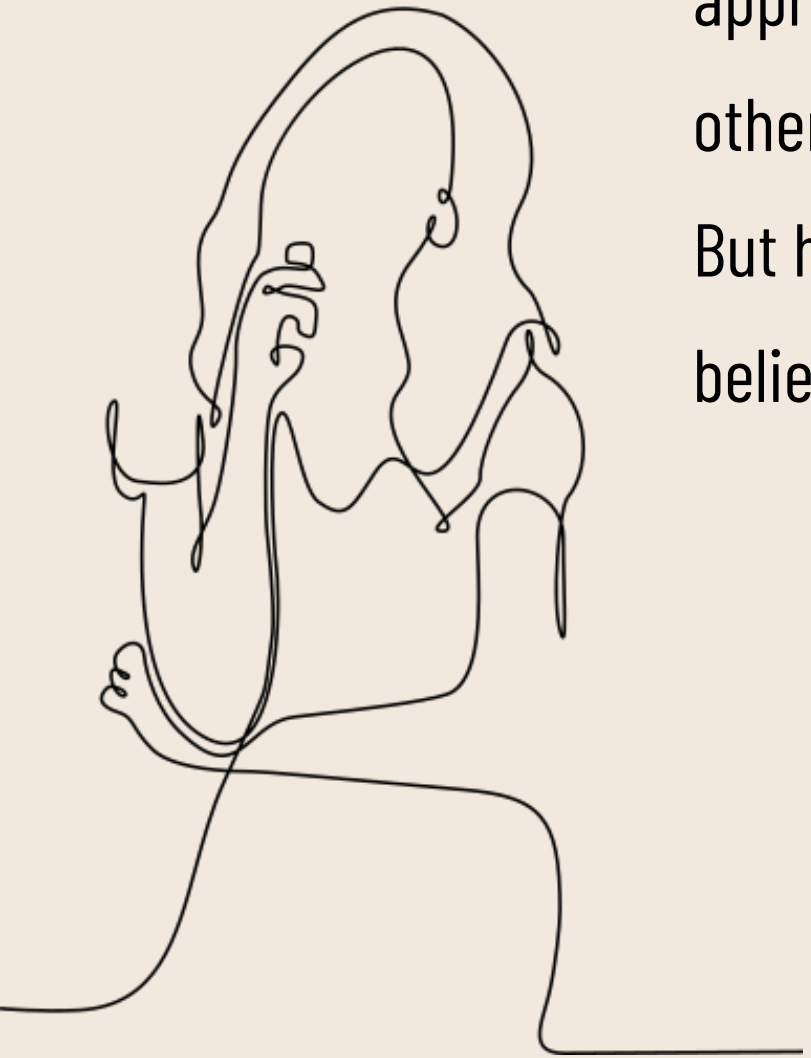

Our mindset **shapes** how we see challenges, approach opportunities, and interact with others.

But how often do we stop to consider how our beliefs and attitudes influence our success?

HAVE YOU EVER AVOIDED PURSUING A GOAL BECAUSE YOU DOUBTED YOUR ABILITIES OR FEARED FAILURE?

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Type of Mindsets

A mindset is a set of beliefs and attitudes that shape how we perceive and respond to the world.

- Fixed Mindset: Belief that abilities and intelligence are static.
- Growth Mindset: Belief that abilities can be developed through effort and learning.

Understanding your mindset is the first step toward creating meaningful personal and professional changes.

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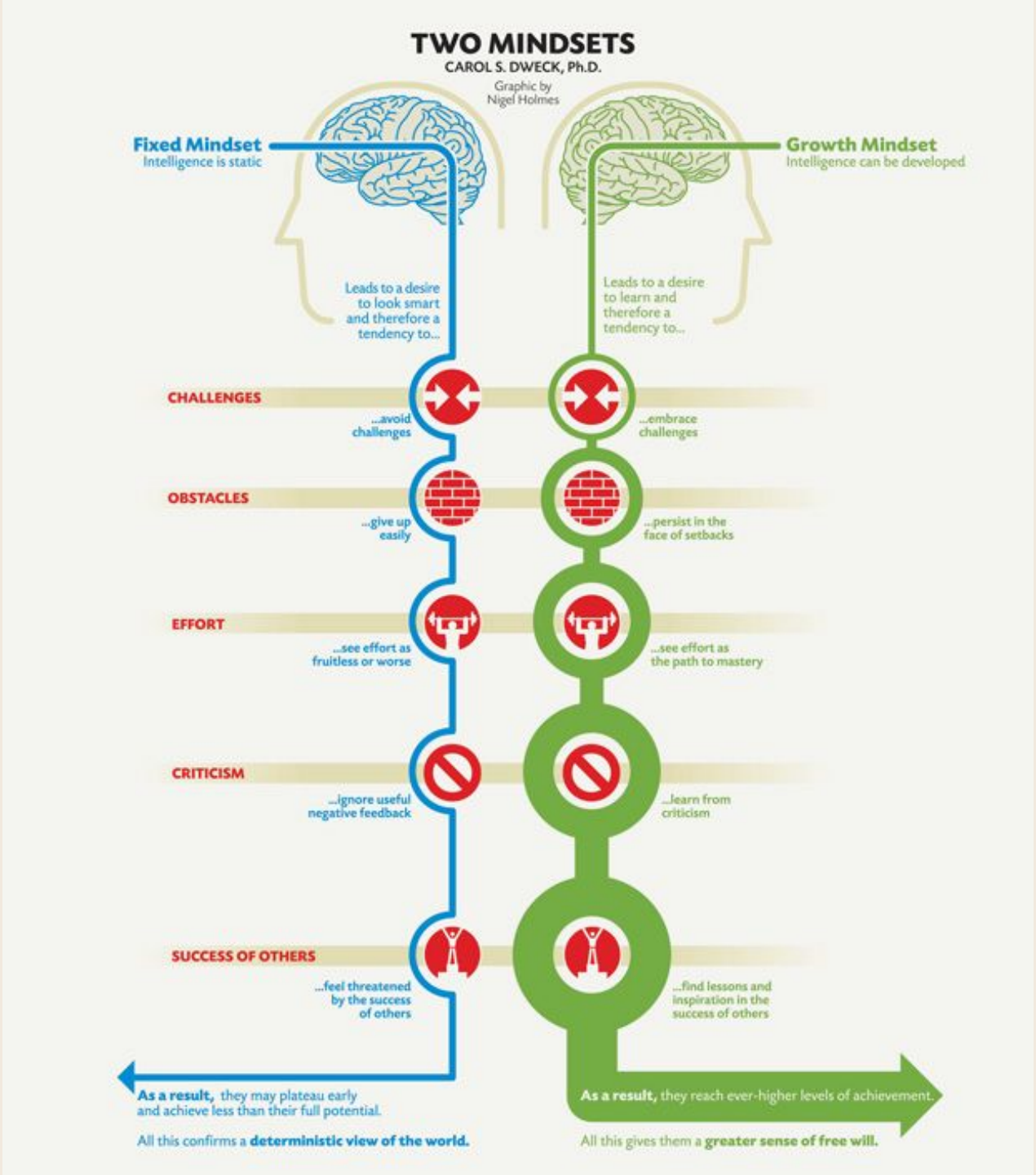
Practical insights



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"WHETHER YOU THINK YOU CAN, OR YOU THINK YOU CAN'T—YOU'RE RIGHT."

HENRY FORD

Why mindset matters

- **Affects how you make decisions**, handle challenges, and build relationships.
- Shapes your ability to see opportunities and stay resilient in tough situations.

A positive mindset encourages innovation and growth, while a limiting mindset can hold you back from achieving your potential.

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EXERCISE

10’

Fixed Mindset vs Growth Mindset

1. Reflect on the mindset assessment individually for 5 minutes.

2. In small groups, choose 2 fixed mindset questions (from the paper) and discuss it with your group on how to transform them into a growth mindset.

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The role of Mindset in gender equity

Challenges Women Face:

- **Societal** stereotypes: "Women are less suited for leadership."
- **Internalized** doubts: "Am I good enough?"

How a Gender-Aware Mindset Helps:

- Encourages breaking stereotypes and challenging biases.
- Promotes confidence and inclusion in workplaces and communities.

Adopting a gender-aware mindset helps create equal opportunities and empowers individuals to overcome systemic barriers.

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Gender Aware Mindset

A "gender mindset" refers to one's awareness and understanding of gender inequality and the role that gender plays in shaping power dynamics, opportunities, and challenges in society.

- Gender **Negative**: belief that being female has negative consequences i.e. “I will be paid less”
- Gender **Neutral**: it does not see gender as an issue. “ My gender has no correlation to the opportunities I have.”
- Gender **Positive**: belief that being female is actually a benefit “My gender enhances the opportunities available to me”

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Creating Gender Aware Mindset

For achieving gender-equality in STEM, we need to focus on transforming collective norms and mindset.

1. Considering the gender/ societal **norms** are the shared perception, emotion about men and women by all societal groups that reproduce gender inequality at all levels (stereotypes).
2. Considering the **narratives** surrounding gender – narratives are a crucial part of our social identities.

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Creating Gender Aware Mindset

To change the collective mindset, one must first recognize its own mindset and gender norms. Only then (especially those in power) engage with the collective gender norms that are in society:

- Change the gender story through the **narrative** - the way information is framed can reinforce stereotypes (i.e. a speech from a CEO, politician or rock star etc.)
- Understand the **power dynamics** – anything that tries to destabilize power brings resistance to change
- Collective problem: encourage **collaborative approaches** to include men in the changing process

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Narrative Examples

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Practical Tools

Inclusive Culture

Creating a culture that values diversity and inclusivity

- **Training on Unconscious Bias**
- **Celebrating Diversity**
- **Promoting Role Models**
- **Use diverse and inclusive narrative / examples**

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Practical Tools

Education & Awareness

These can equip with the knowledge to recognize and challenge gender stereotypes.

- **Question stereotypes and biases in daily interactions**
- **Tailored training workshops**
- **Discussions and awareness sessions, at all levels**

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Practical Tools

Diverse Teams

Including individuals from various genders and backgrounds to ensure a range of perspectives in decision making.

- Advocate for fairness and equity in your organization
- Inclusive team practices
- Sponsorship and support

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Practical Tools

Inclusive Networks

Women and marginalized groups often benefit from mentorship and peer support

- Mentoring/ peer-to peer programs
- Network Events
- Online platforms

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Practical Tools

Men as Allies

Helping men understand the importance of gender equity and their role in promoting it.

- Men's advocacy programs
- Workshops on Allyships

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Why mindset matter for women in STEM

- Mindsets influence how we perceive challenges, take risks, and achieve success.
- Women in STEM often face **societal barriers** and **limiting beliefs** that impact their journey.

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- Limiting beliefs stem from societal expectations and past experiences.
- Recognizing and challenging these beliefs is the first step toward growth.

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- Common barriers:
  - fear of criticism,
  - failure, or
  - being perceived as “too aggressive.”
- Examples:
  - “I’m not good in programming”
  - Reframe: “I can improve with practice and preparation.”

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EXERCISE

What is your Gender mindset?

1. *Is your gender mindset positive, neutral or negative?*
2. *Can you think of two examples that represents your gender mindset (or biases/ barriers related to gender in your workplace)?*
3. *What could you do to transform those biases?*

15’

Reflect & Discuss

- *Note down your reflections and/or main key words (5 min)*
- *Discuss in groups of 2-3 (5 min)*
- *Share the main findings of your group with the others (5 min)*

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QUESTIONS AND END OF SESSION

What are you taking away from this session?

Describe how you feel in one word.

Thank You

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Women Stem-up for GOOD Program

Topic 1 - Gender in STEM

Session 3 – Empathy for Inclusion

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Learning objectives

- Understanding the concept of empathy
- Applying empathy with practical tools
- Making the link between empathy and gender

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10’

EXERCISE: Reflection and sharing

Remember a moment when you felt truly understood by another person.

What was it about the moment you shared that made you feel understood? That the person in front of you was showing empathy?

Small groups (5'), then large group presentation (5')

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Components of empathy

COGNITIVE EMPATHY

THE ABILITY TO UNDERSTAND THE PERSPECTIVES AND EMOTIONS OF OTHERS WITHOUT DIRECTLY FEELING THEM

AFFECTIVE EMPATHY

THE ABILITY TO FEEL THE EMOTIONS OF OTHERS WHICH CAN LEAD TO A DESIRE TO HELP OR SUPPORT

EMPATHETIC BEHAVIOUR

THE ACTIONS TAKEN BECAUSE OF EMPATHY, SUCH AS OFFERING HELP, SUPPORT, OR UNDERSTANDING

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Impact

Empathy enables to :

- Be focused on people and to adept the solution to all people
- Forge closer links with your partners/ team in a win-win situation
- Nurture relationships with your network and have a circle of support
- In the long term, mobilize the team

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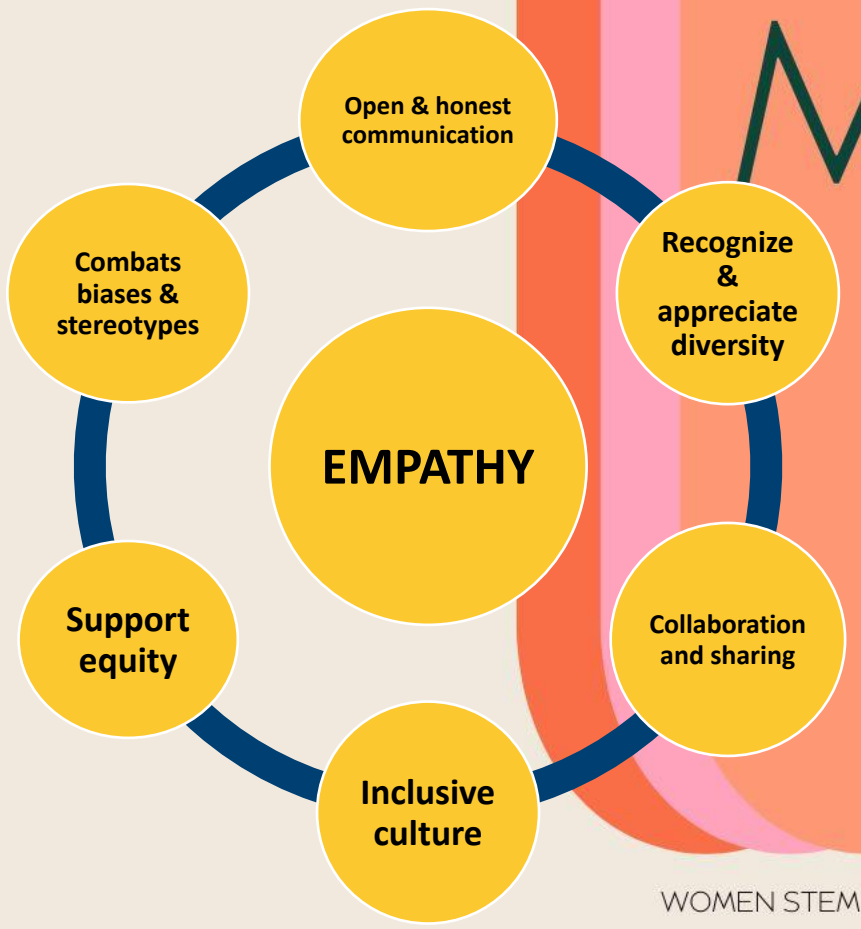
Relevance

- Empathy resonates strongly with social impact. It enables us to better understand the societal problems that need to be addressed. It enables us to listen to and understand our beneficiaries better and more accurately.
- Empathy is an essential ingredient to design initiatives that promote **DEI**:

✔ **D**IVERSITY
✔ **E**QUITY
✔ **I**NCLUSION

- The ability to empathize therefore allows for better consideration of gender in our practices!



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How do you think we develop empathy?

Because yes, it can be learned!

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How to develop empathy

- Listen actively
- Train yourself to deal with people who are very different from you
- Don't judge or interpret
- Be kind
- Put yourself in the other people's shoes (watch out for the “if I were you, I'd...” bias)
- Pay attention to non-verbal communication
- Work on your own vulnerability and ability to feel and express emotions
- Read books or watch documentaries to explore different points of view.
- Be careful not to become manipulative (e.g. advertising)

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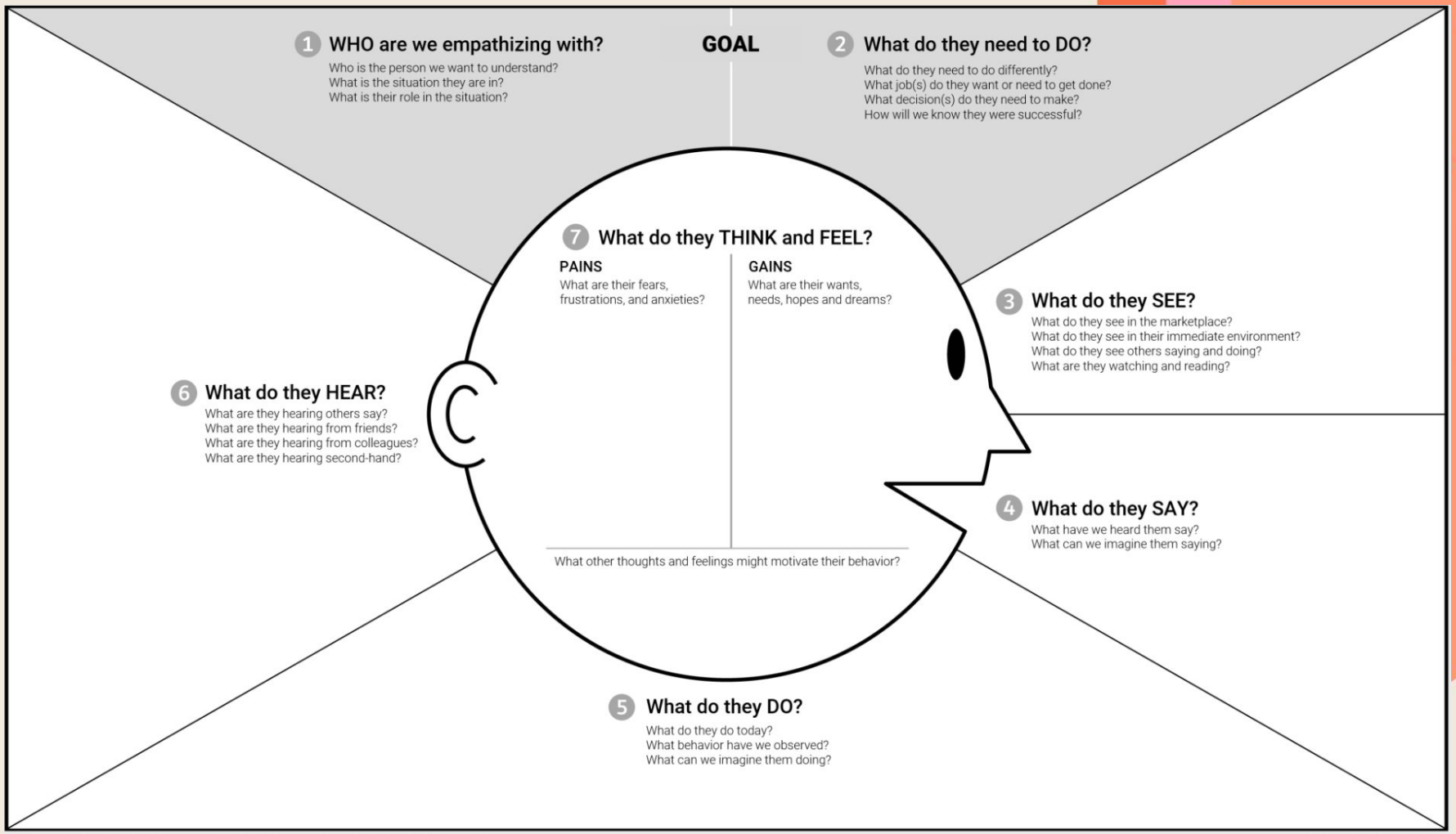
15’

EXERCISE: Practical role-playing with the empathy card

The Empathy Map is a collaborative visual tool that helps you put yourself in the shoes of a user or customer. It helps you better understand their needs, emotions, motivations and behaviors.

Select a persona (ideally quite distant from you in terms of identity) whom you might meet in the course of your work or in the structuring of your project. Introduce the person to your partner.

He or she will then answer the questions in your interview outline.



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Active Listening levels

Confirming

Were you listening to confirm what you already knew?

Widening

Were you listening out for new information and ideas that might have been different to yours?

Empathic

Were you listening to understand the experience of the other (and let go of your own assumptions and judgements)?

Generative

Were you listening for the deepest level of truth behind what they were trying to say?

Source: adapted from Otto Scharmer's 4 Levels of Listening

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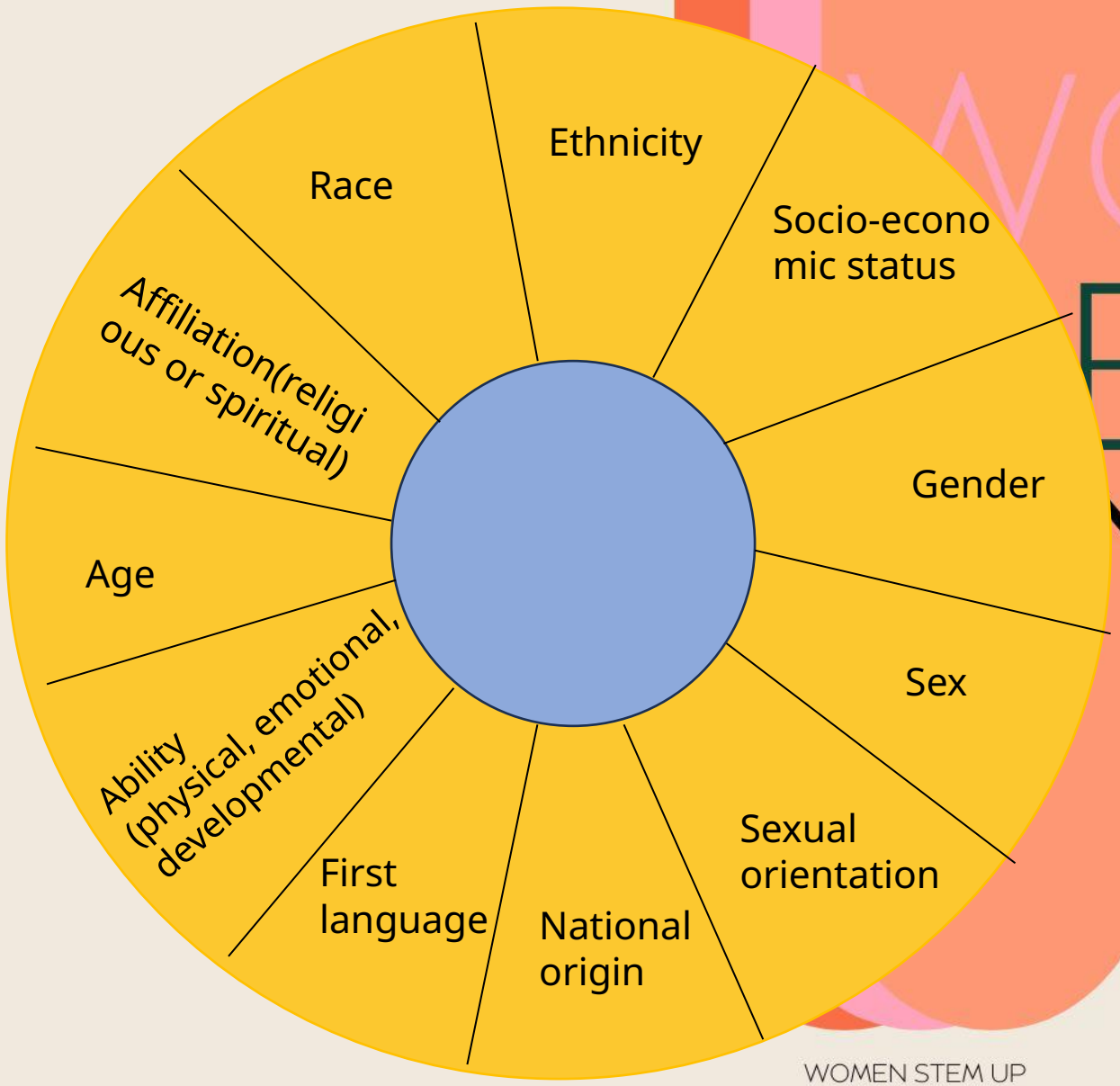
Social Identity map

The Social Identity Wheel helps you become aware of your visible and invisible identities, reflect on positions of power, privilege or marginalization, and encourage empathy to help you understand others.

1. What identities do you think about most often?
2. What identities do you think about least often?
3. What identities would you like to learn more about?
4. What identities have the strongest effect on how you perceive yourself?
5. What identities have the greatest effect on how others perceive you?



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Source: Adapted for use by the Program on Intergroup Relations and the Spectrum Center, University of Michigan

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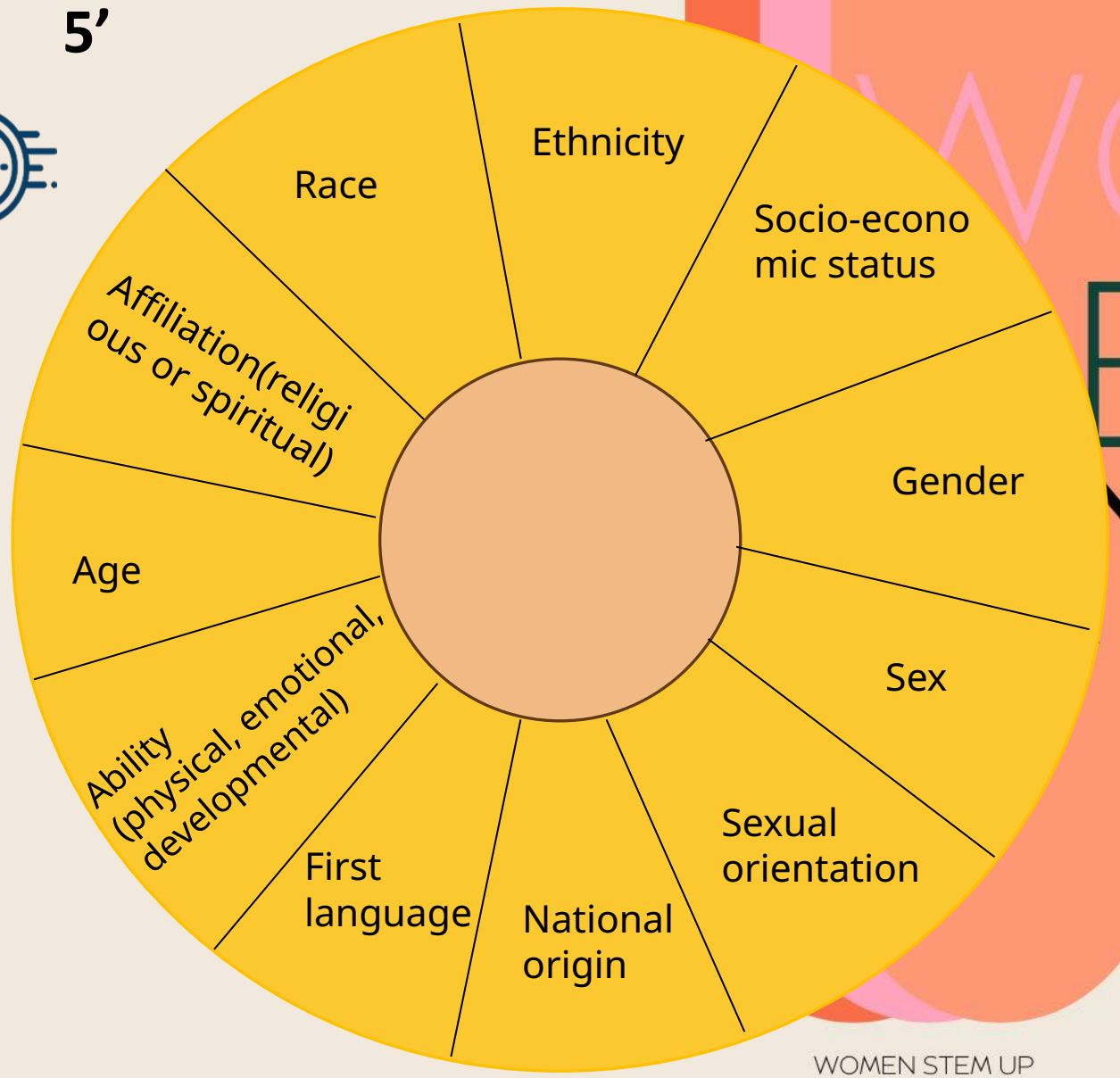
5’

Social Identity map

Large-group feedback
What does the social identity route bring out in you?



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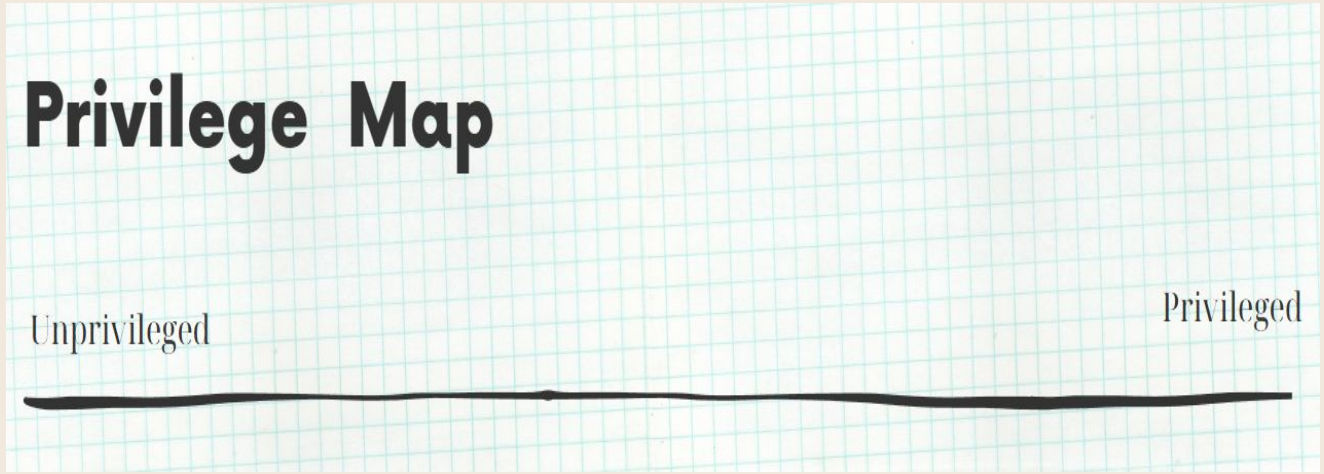
Putting into practice: the privilege card

10’



Think of your persona presented in Part 1.
Place the persona on this line, taking into account all the different aspects of the social identity wheel (5').

As a large group, present the persona and share where you've placed it, briefly explaining why you've placed it where you have, according to the categories of the social identity wheel (5').

1. Ethnicity and Race
2. Socio-economic status
3. Professional identity
4. Sexual orientation
5. Ethnicity
6. Education
7. Physical, emotional, developmental ability/disability
8. Age
9. Religion or spirituality

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QUESTIONS AND END OF SESSION

What are you taking away from this session?

Describe how you feel in one word.

Thank You

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Topic 1 - Gender in STEM

Session 4 – Design thinking for inclusive solutions

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Learning objectives

- Design thinking principles
- Applying design thinking
- Creating solutions

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What is design thinking?

*"A non-linear, **iterative** process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test"*

DT requires **team-work** and the focus is not only on solutions that are human-centred, but the process itself is **deeply human**.

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Did you know what characteristics DT entails as an approach?

- **Human-centered:** begins from deep empathy and understanding of needs and motivations of people

- **Collaborative:** it benefits greatly from the views of multiple perspectives

- **Optimistic**: we all can create a change—no matter how big a problem, how little time or how small a budget

- **Experimental:** designers can learn from their mistakes, because they come up with new ideas, get feedback on them and then **iterate**

Source: IDEO (2013)

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Origins of Design-Thinking

First applied in the business sector to increase innovation and competitiveness. Due to its human centred approach, it was transferred and applied next in multiple contexts (e.g., the social innovation domain, educational area).

Why Design thinking?

- It gives us faith in our creative abilities for transforming difficult challenges into opportunities for design.
- It helps us understanding human needs and motivations.
- It can be applied to all areas and fields, so a DT workshop/ activity can therefore be useful for everyone.
- It teaches people **how to problem-solve**: a DT activity teaches problem solving in action, giving participants tool which can be applied to almost any challenge and in any examined area.

It fosters innovation and teamwork: The very essence of Design Thinking lies in its collaborative vision and "*outside the box*" thinking

Source: https://careerfoundry.com/en/blog/ux-design/design-thinking-workshop/

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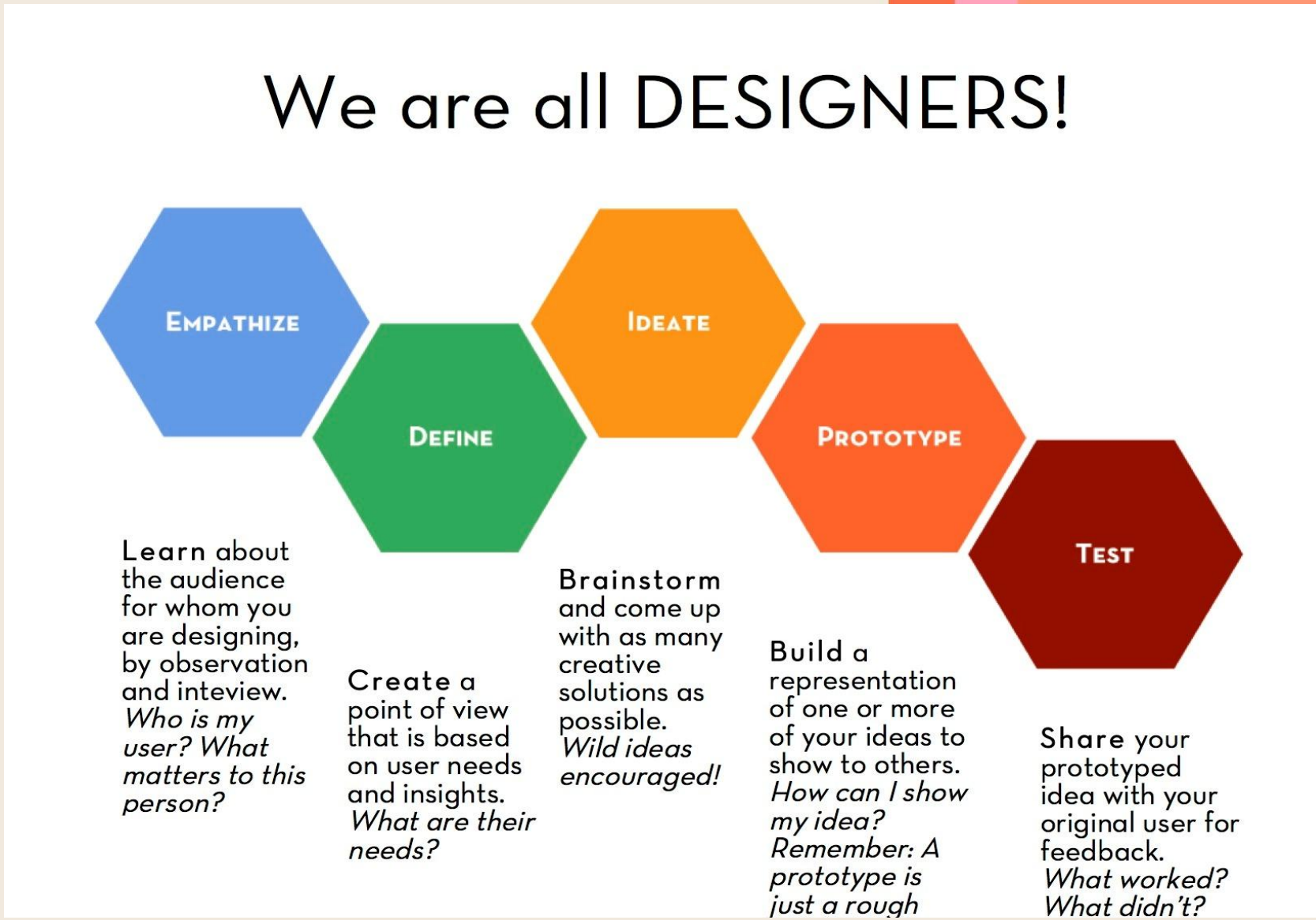
The Hasso Plattner Institute of Design at Stanford (aka the d.school) describes design thinking as a five-stage process.

Note:
These stages are not always sequential, and teams often run them in parallel, out of order and repeat them in an iterative fashion.

Source:
http://steamcurriculum.weebly.com/design-thinking.html



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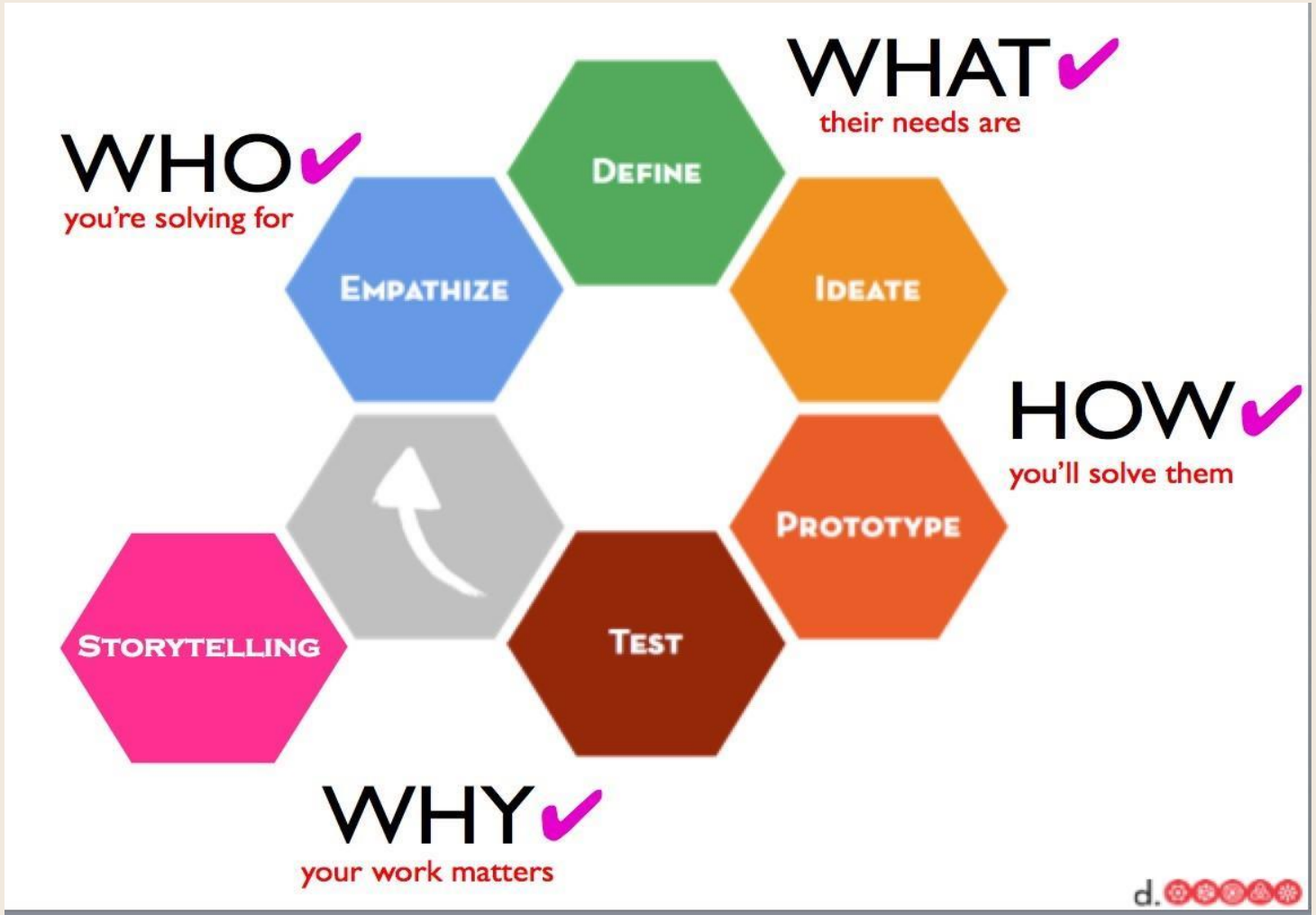
In simple words…what each step aims for?



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Activities for the Design Thinking workshop (practical part)

- The proposed activities (next slides) are broken down in five steps: *Empathize, Define, Ideate, Prototype, and Test*.

- Even though the phases are not necessarily linear, and a certain degree of iteration is at least encouraged, the steps for this workshop are presented and analysed in a sequential way for reasons of simplicity.

As each phase require at least 25 minutes per activity/ DT step, in this workshop the exercise will be on step 1-2 (and if time allows it activity 3).

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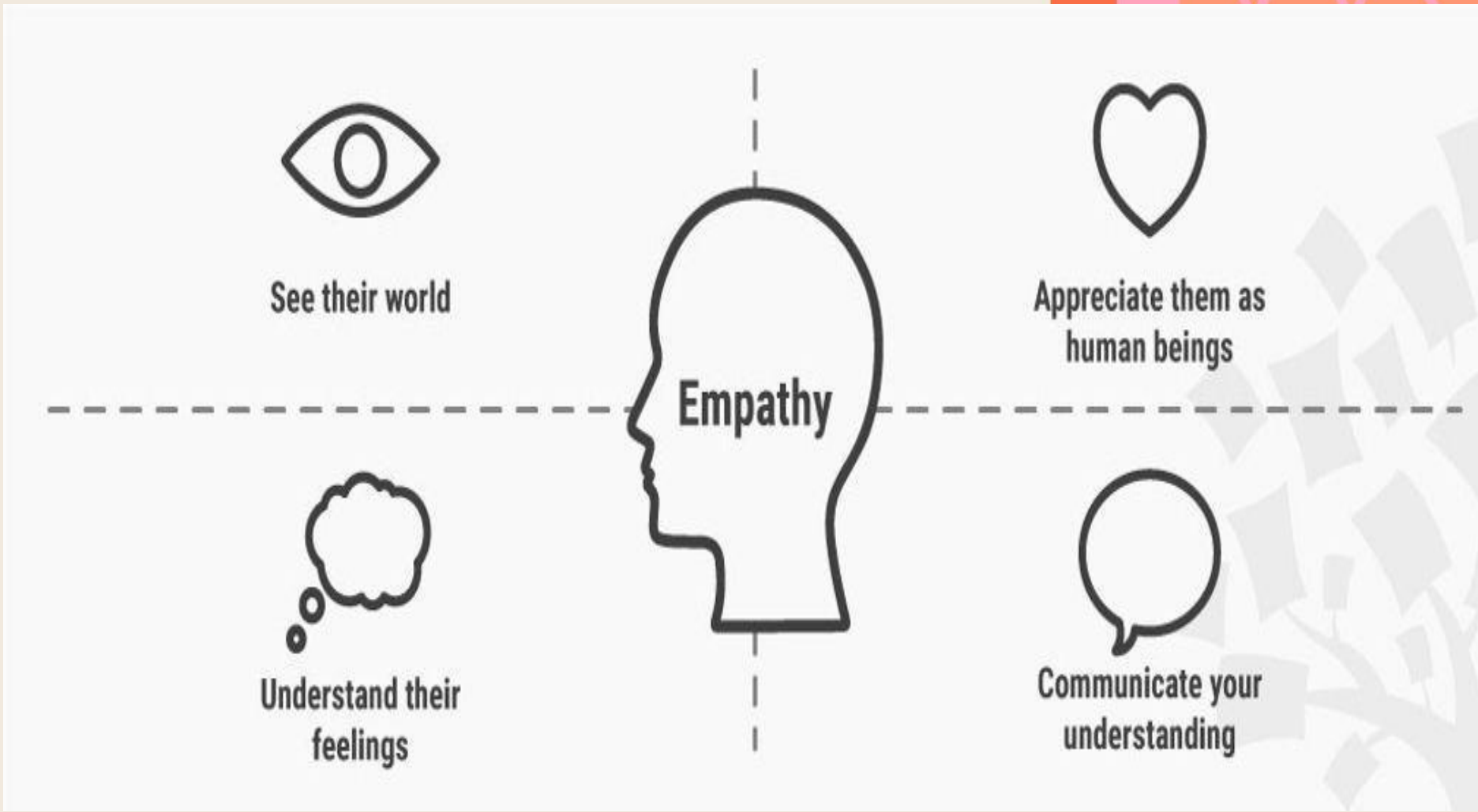
How to start the Design Thinking process:

Step 1: Empathize

Exploring the user's needs and feelings!



Activity 1: Understand the users, their needs, and concerns

Objectives	Empathy is the **cornerstone of any successful design project.** The extent to which you understand and empathize with your users ultimately determines the outcome of your design! Aim: **understand the users' needs and personal perspectives** within the context of their design challenge.
Preparation & material	• Division of participants in small groups • Papers and pens for collecting ideas through brainstorming, or a board like Miro , where everyone can give their input
Recommended time	20-25 minutes
Practical instructions	• Participants will be divided into **small groups of roughly 3-4 persons each**. The aim is to perform small **brainstorming sessions or** among participants, during which **participants will be asked to discuss and contemplate on the needs of their community**.

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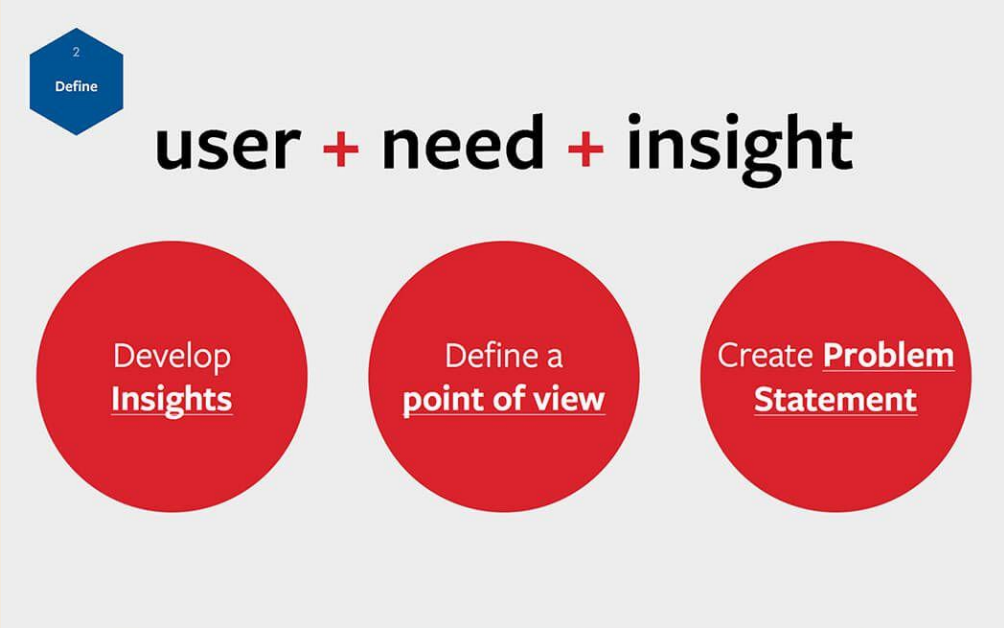
Step 2: Define

Define a problem statement



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Activity 2: Collectively discover the true problem !

Objectives	The "Define" phase, which follows empathy, involves in principle **synthesizing findings in order to identify and articulate an approach to the challenge.** The define stage is dedicated to defining the problem: **What user problem will you be trying to solve?** In other words, '**what is your design challenge'?**
Preparation & material	A4 papers, a whiteboard with sticky notes, marker pens, post-it notes. In the case of a virtual workshop, the same handy platform, such as Jamboard, can be deployed.
Recommended time	20-25 minutes
Practical instructions	**1st step**: participants will be asked for around 10 min to think about and write down in a paper or a virtual whiteboard their thoughts and insights about the following: **User**: *Who are you designing for?* **Need:** *What does this user need?* **Insight:** *What surprised you about this user? What do you notice that nobody else notices?* **2nd step**: **another 15-minutes brainstorming session** will follow where the core ideas will be discussed and merged into a single problem statement. A rule of thumb: participants should focus on the user's **real emotional needs**. This means that **it is not necessary from now to jump to proper solutions,** but mostly to grasp the essence of the problem.

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Step 3: Ideate

Generate ideas and potential solutions!

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Activity 3: Time for idea generation!

Objectives	The goal of this activity is to encourage and support students to start **thinking of how to solve the problem they've researched and defined** (i.e. gender inclusion in STEM) In principle, the ideate phase is when team members focus on the **generation of creative solutions**. Rule here: **quantity and diversity of ideas, not sticking to a theoretically 'best' solution** (participants should come with as many and as different solutions as possible) Important reminder: All steps of design thinking process should be combined by creativity and teamworking, so exploring options and generating a wide variety of ideas is essential to arrive at a genuinely creative solution.
Preparation & material	• A big board is needed. The overall size of the board is essential to add and display as many ideas as possible. The ideas will be written down directly in the board with a pen or posted in sticky notes (post-it notes). • For virtual workshops: a platform like Jamboard, Miro or Mural can be used as alternative. • It is advisable that participants be kept in the same groups to ensure continuity with the previous steps.
Recommended time	25 minutes
Practical instructions	• In the beginning, **participants will be asked to start brainstorming and suggest as many creative ideas as they can think**. The whole process should last approximately **10'.** This is the **creativity stage**, where participants must feel unconstrained and just express freely themselves. • Upon completion of the brainstorming, participants will evaluate each idea according to following criteria: (i) **feasibility of idea**, (ii) **cost-effectiveness of idea**, and (iii) **how rational the idea is**, (iv**) originality of idea**. This is the stage where ideas are carefully reconsidered collectively. • For each idea, participants can assign points for each criterion, through a process of open voting: **1 if the idea scores very poor** for that criterion, **and 5 if it scores very well**. This method will facilitate the process showcasing which idea(s) should become prototyped solutions (**15'**).

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Reflections/ Questions

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Sources- further material:

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Interaction Design Foundation. (2021). What is Design Thinking and Why Is It So Popular? Available at: https://www.interaction-design.org/literature/article/what-is-design-thinking-and-why-is-it-so-popular & https://www.interaction-design.org/literature/topics/design-thinking

'Empathize' step Stevens, E. (2021). What Is Empathy in Design Thinking? A Comprehensive Guide. Available at: https://careerfoundry.com/en/blog/ux-design/what-is-empathy-in-design-thinking/ &

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Define step Stevens, E. (2021). Stage 2 in the Design Thinking Process: Define the Problem. Available at: https://careerfoundry.com/en/blog/ux-design/stage-two-design-thinking-define-the-problem/

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Prototype phase Interaction Design Foundation. (2021). Prototyping. Retrieved from: https://www.interaction-design.org/literature/topics/prototyping

Testing phase Workshopper. (2021). Design Thinking Phase 5 - How to Test Effectively. Retrieved from: https://www.workshopper.com/post/design-thinking-phase-5-how-to-test-effectively

Extra material:

https://static1.squarespace.com/static/57c6b79629687fde090a0fdd/t/58ac891ae4fcb50f1fb2f1ab/1487702304601/Facilitator%27s+Guide_Design+Thinking.pdf

https://www.fipp.com/news/using-design-thinking-to-drive-innovation/#

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Women Stem-up for GOOD Program

Topic 1 - Gender in STEM

Session 5 – Hands-on Project

LINKÖPING UNIVERSITY

UNIVERSITY OF THESSALY

STIMMULI for social change

NTNU Norwegian University of Science and Technology

DIGITAL LEADERSHIP INSTITUTE

Grant agreement: 2022-1-SE01-KA220-HED-000086239

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Topic 1: Gender in STEM

1. **Understanding Gender Bias** : Examining the societal & institutional barriers that women face in STEM and how to navigate them with confidence and resilience.
2. **Gender Aware Mindset:** how to cultivate a gender aware mindset as an essential foundation to inclusivity and equity in STEM
3. **Empathy for inclusion & social impact:** empathy-based methodologies as a foundation for developing solutions to social problems and contributing to gender equality.
4. **Design Thinking for Gender-Inclusive Solutions**: Applying design thinking principles to create products and services that address the needs of women and marginalized groups, that could result in building gender-neutral STEM products.
5. **Hands-on project**: Choose a gender issue they've experienced in STEM and, in small groups, propose a solution based on the learnings from above.

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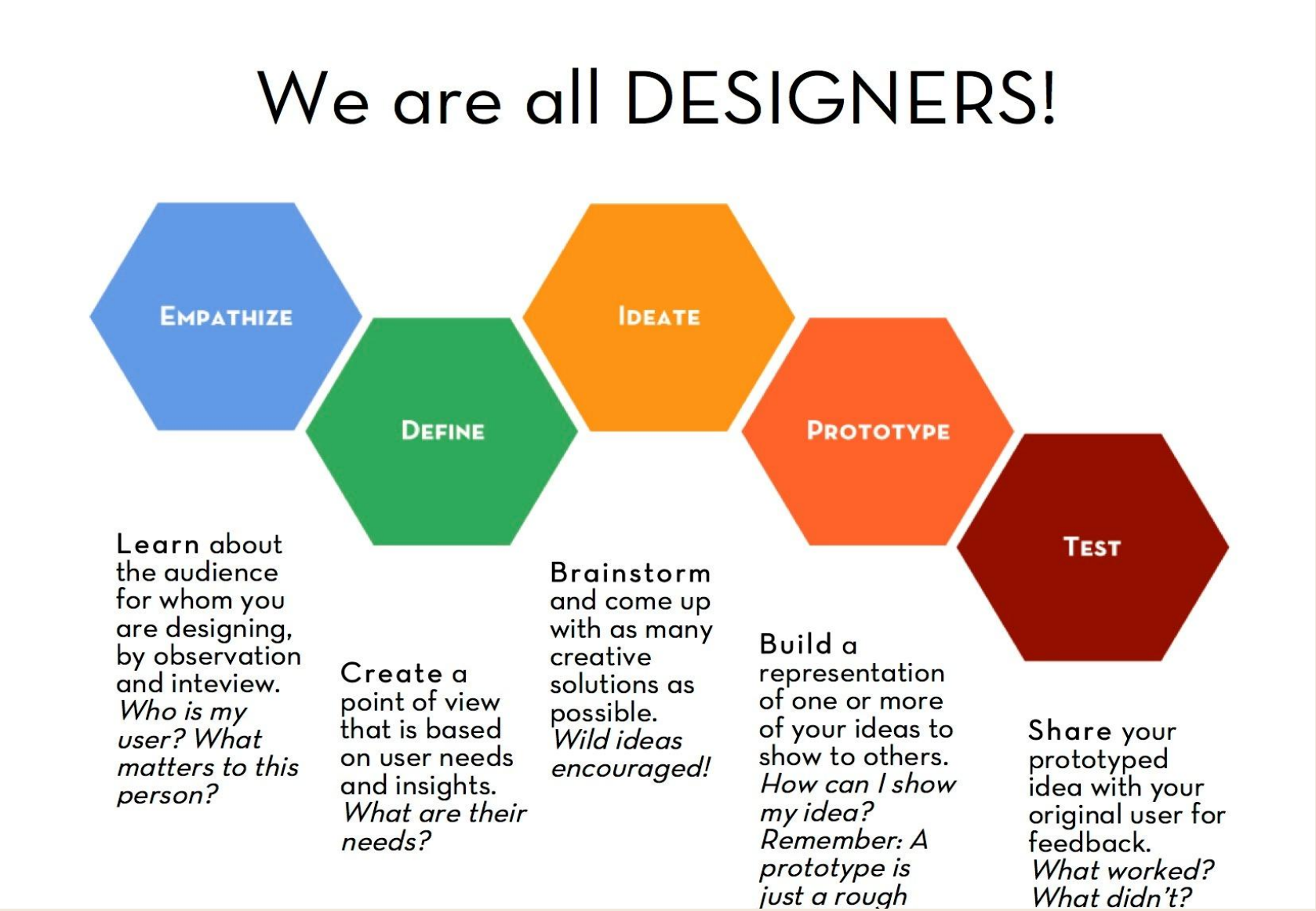
Previous steps… and the next



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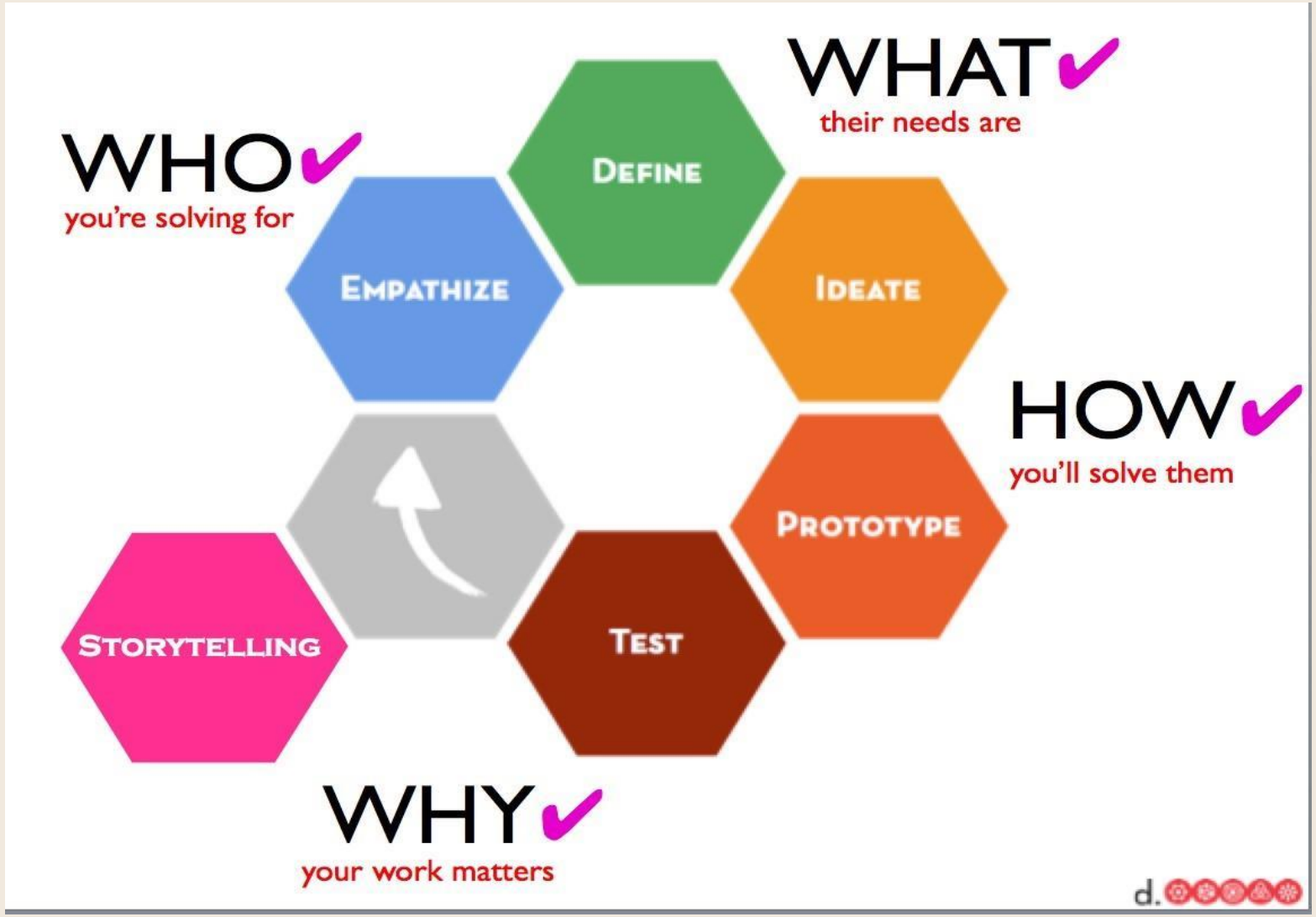
What each step aims for



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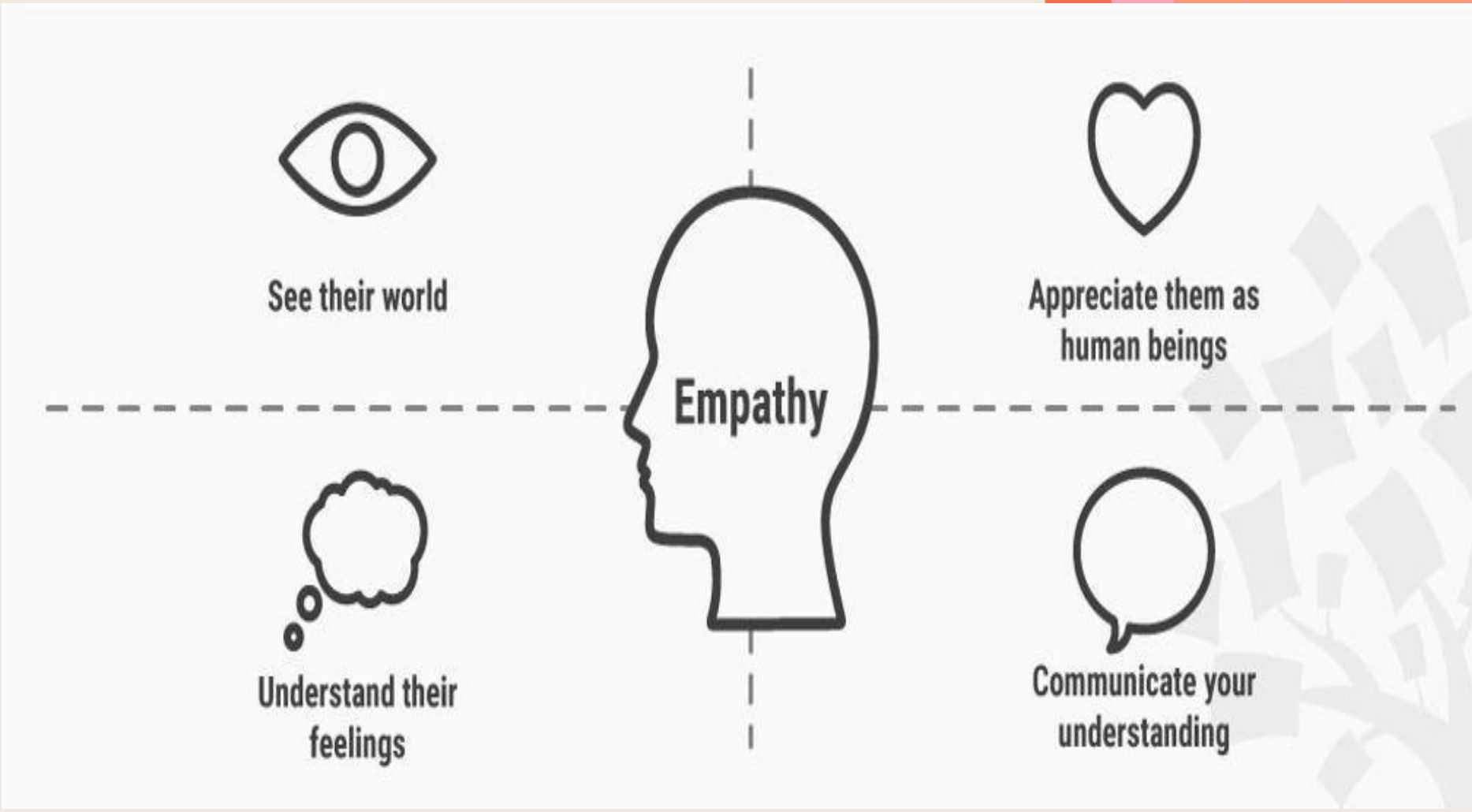
What has been done - the first step

Step 1: Empathize

Exploring the user's needs and feelings!



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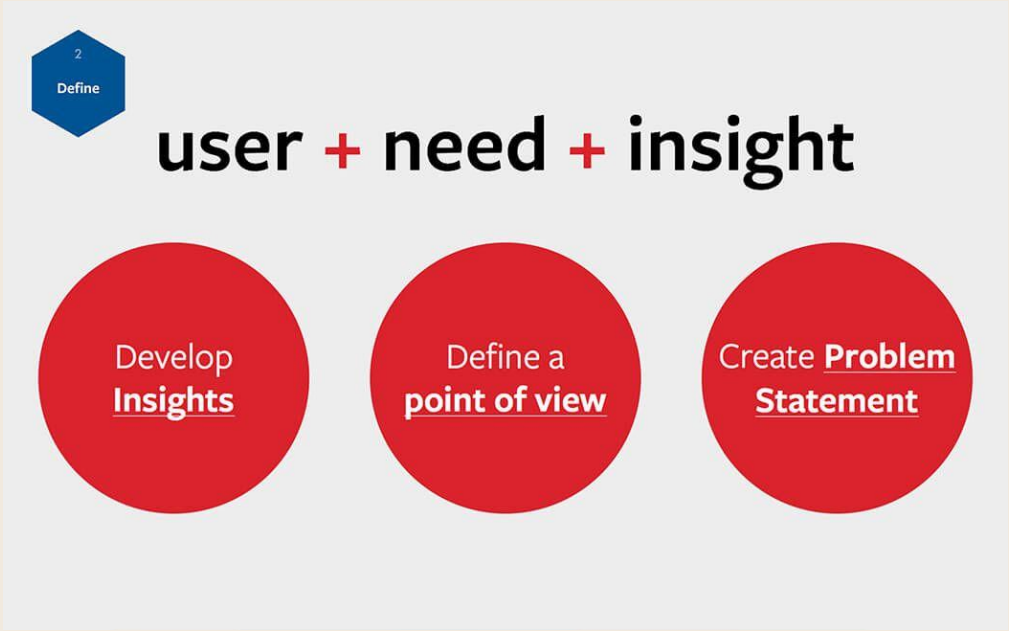
What has been done - the second step

Step 2: Define

Define a problem statement



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Next step

Step 3: Ideate

Generate ideas and potential solutions!

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Activity 3: Time for idea generation!

Objectives	The goal of this activity is to encourage and support students to start **thinking of how to solve the problem they've researched and defined** (i.e. gender inclusion in STEM) In principle, the ideate phase is when team members focus on the **generation of creative solutions**. Rule here: **quantity and diversity of ideas, not sticking to a theoretically 'best' solution** (participants should come with as many and as different solutions as possible) Important reminder: All steps of design thinking process should be combined by creativity and teamworking, so exploring options and generating a wide variety of ideas is essential to arrive at a genuinely creative solution.
Preparation & material	• A big board is needed. The overall size of the board is essential to add and display as many ideas as possible. The ideas will be written down directly in the board with a pen or posted in sticky notes (post-it notes). • For virtual workshops: a platform like Jamboard, Miro or Mural can be used as alternative. • It is advisable that participants be kept in the same groups to ensure continuity with the previous steps.
Recommended time	25 minutes
Practical instructions	• In the beginning, **participants will be asked to start brainstorming and suggest as many creative ideas as they can think**. The whole process should last approximately **10'.** This is the **creativity stage**, where participants must feel unconstrained and just express freely themselves. • Upon completion of the brainstorming, participants will evaluate each idea according to following criteria: (i) **feasibility of idea**, (ii) **cost-effectiveness of idea**, and (iii) **how rational the idea is**, (iv**) originality of idea**. This is the stage where ideas are carefully reconsidered collectively. • For each idea, participants can assign points for each criterion, through a process of open voting: **1 if the idea scores very poor** for that criterion, **and 5 if it scores very well**. This method will facilitate the process showcasing which idea(s) should become prototyped solutions (**15'**).

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Step 4: Prototype

Time to build your idea!

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Activity 4: The moment for the solution's prototype!

Objectives	• to **start creating draft and low-resolution prototypes** of the selected solution(s) that were ideated during the ideation step. • to **give substance to the suggested solutions through a creative process**, where girls and women use simple materials to embody the ideas. A prototype is nothing more than an artifact that serves as draft miniature of the solution.
Preparation & material	This phase is the most demanding in terms of materials. Due preparation and provision of materials to participants is of outmost importance. However, the process can be kept **simple** and **budget-friendly**. For physical workshops: Cardboard/paperboard, scissor, markers, sticky tapes, plasticine, lego bricks, glue stick, colored construction papers, pens, big table(s) and anything else that is considered necessary for carrying out the phase. For online workshops: **PowerPoint programme**, **Mural**, **Microsoft paint programme.**
Recommended time	25 minutes
Practical instructions	1)Participants will be divided in **groups** (of 3-4 ppl). Each group will be responsible to create a prototype of the corresponding two or three most popular ideas that have been selected in Step 3 (Ideate). 2) Each group will be given a maximum of 20- 25 minutes to design and create its prototype. In a physical event: each group will work on its own table, and groups should be distanced from each other for better concentration. In a virtual event: participants will be divided into break-out rooms and work on a common space platform. **Note**: If the choice of creating a model or an artifact seems to be too much complex or challenging, there are alternatives of achieving the expected outcome instead of a model's creation: 1) **create a diagram** (mapping of the structure, process and network of participants' idea); 2) **Create a storyboard**: i) Visualize the complete experience of your idea over time through a series of images, sketches, cartoons or even just text blocks; ii) Use Post-it Notes or individual sheets of paper to create the storyboard so you can rearrange their order.

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Step 5: Test

Testing your prototypes and gather feedback!

Activity 5: The testing phase: another chance to understand the user!

Objectives	Testing phase: the action of requesting feedback about the prototypes that were created. It gives them another opportunity to gain empathy for the people they are designing for. Objectives: (i) to refine prototypes and solutions, (ii) to learn more about their user, (iii) to refine their point of view. A rule of thumb: **the final stage of design thinking is not necessarily the last thing designers will do**. Remember: **design thinking is an iterative process**, where designers are expected to go through a series of changes, edits, and refinements.
Preparation & material	❖ Pens, pencils, and notebooks for writing down thoughts and collecting feedback ❖ Colored post-in notes
Recommended time	25 minutes
Practical instructions	The process will unfold as follows: 1) The previous groups will **present to each other their prototypes** and afterwards they will critically provide feedback as if they were the users (**under a hypothetical scenario**). Participants in one group will take over the role of the design thinkers and the second group will act as the target group/users of the problem's solution. The designers' team will make a brief presentation of the prototypes(s) they prepared in the previous step (**10 minutes**). 2) Upon presentation, the users' team **will think of the proposed idea(s) and provide feedback** either for the prototype or something related to previous steps (**5 minutes**). **Suggestion**: the design thinkers' team can gather easily feedback from their "users" by asking them and reflecting upon these questions: *What worked? Wat could be improved? Any further questions ? Any other ideas?* 3) Once the presenting group receives the feedback, they can devote around 10 minutes to reflect on them and refine as many points and characteristics on their design challenge.

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Reflections/ Questions

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Fixed/Growth Mindset
Questionnaire and Discussion

Fixed mindset: a way of thinking about your own *intelligence, abilities and talents*, viewing them as innate, inherently stable and unchangeable over time.

Growth mindset: a way of thinking about you own *intelligence, abilities and talents* as learnable and capable of improvement through effort.

I. Answer from 1 (NOT AT ALL) to 5 (VERY MUCH)

QUESTION	***ANSWER*** (circle the number)
When you're not good at something, or when facing adversity, **do you easily give up**?	**1 2 3 4 5**
Do you often **avoid new experiences and challenges?**	**1 2 3 4 5**
Do you believe that **hard work can get you far in life?**	**1 2 3 4 5**
Do you feel **threatened by other people's success?**	**1 2 3 4 5**
Do you perceive **feedback as criticism?**	**1 2 3 4 5**
Do you **fear change?**	**1 2 3 4 5**
Do you often **blame others** for your setbacks?	**1 2 3 4 5**
Are there situations where you **disengage your intelligence?**	**1 2 3 4 5**
TOTAL =	

Results

- From **0 to 15** = leaning towards a more **flexible, growth-oriented mindset**
- From **15 to 30** = leaning towards **both a fixed and a growth mindset**, depending on the situation
- From **30 to 40** = leaning towards a rather **fixed mindset**

II. Growth mindset discussion questions

1. **Can you think of a time you faced an important opportunity or challenge with a fixed mindset? What were your thoughts and worries – about your abilities? About other people's judgments? About the possibility of failure? Describe them vividly.**

Grow Your Mindset: Now, can you take that same opportunity or challenge and switch into a growth mindset? Think of it as a chance to learn new things. What are the plans and strategies you're thinking about now?

2. **Think of times other people outdid you and you just assumed they were smarter or more talented.**

Grow Your Mindset: Now consider the idea that they just used better strategies, taught themselves more, practiced harder, and worked their way through obstacles. You can do that too, if you want to.

3. **Is there something in your past that you think measured you? A test score? A dishonest or callous action? Being fired from a job? Being rejected? Focus on that thing.**

Grow Your Mindset: Now put it in a growth-mindset perspective. Look honestly at your role in it, but understand that it doesn't define your intelligence or your personality or anything else about you. Instead, as: What did I (or can I) learn from that experience? How can I use it as a basis for growth? Carry that with you.

4. **Do you use feeling bad as a reason for doing nothing? When you feel disappointed, thwarted, cheated, anxious or depressed do you use this as reason to stop trying?**

Grow Your Mindset: What steps could you take to help growth mindset thinking overcome your fixed mindset? Discuss a specific plan.

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Exercise Empathy Map

How to fill in the Empathy Map:

1 What You Say and What You Do:

- What do you express in public? How do you behave?
- Is there a contradiction between what you say and what you do?

2 What You Think and Feel:

- What do you truly think but may not say out loud? What are your biggest concerns?
- How do you feel in certain situations?

3 What You Hear:

- Who are your main influencers (friends, colleagues, society, media)?
- Which opinions and comments influence you the most?

4 What You See:

- What do you observe in your daily life?
- What is your environment like (work, social, cultural)? What inspires or discourages you?