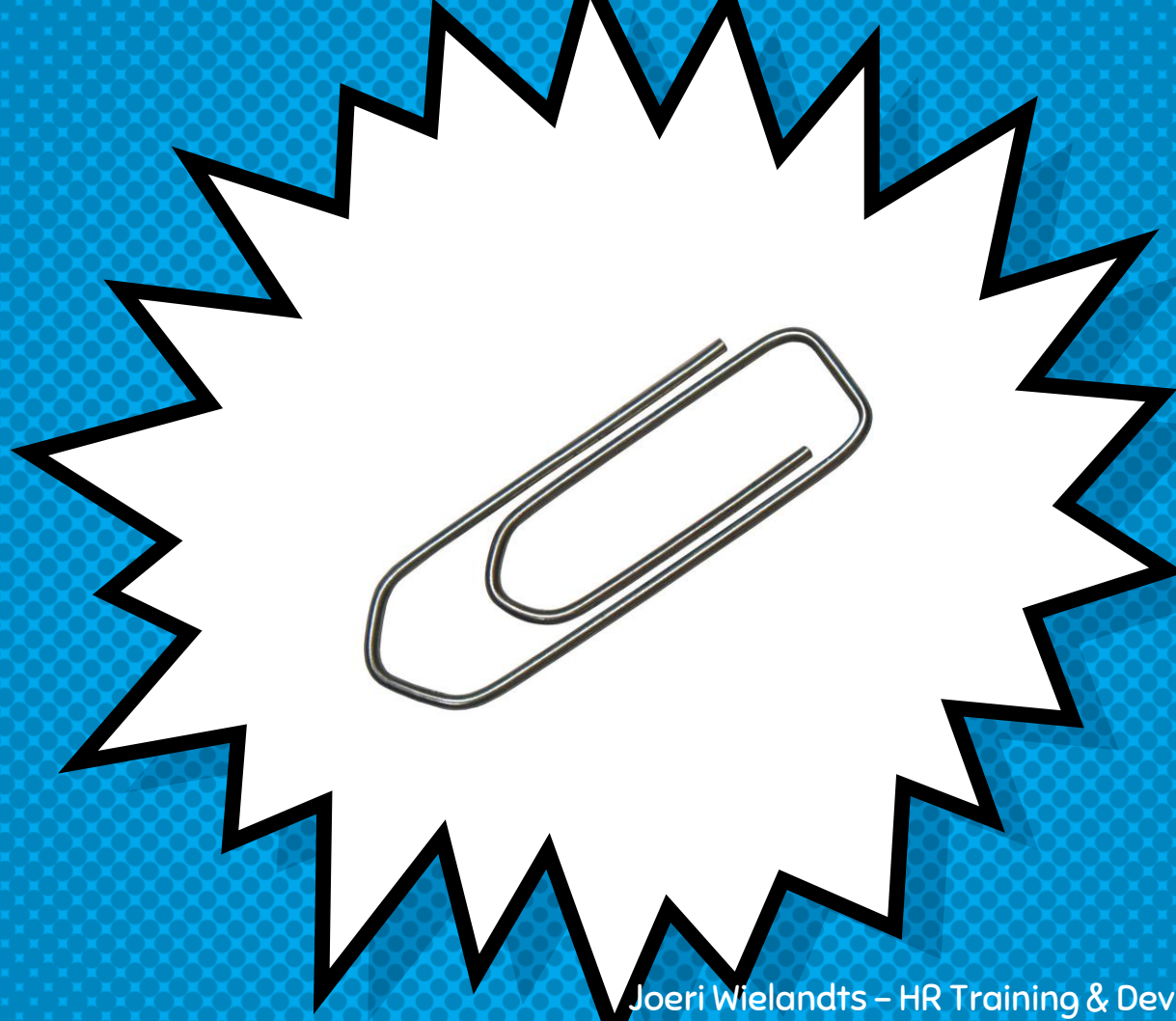


CREATIVE PROBLEM SOLVING

Joeri Wielandts Training & Development – KU Leuven



BRAINSTORMING



MAJOR THREATS TO TEAM CREATIVITY

- × Free riding, social loafing, downward norm setting
- × Conformity, fear of judgement
- × Production blocking
- × Coordination losses

SOLUTIONS

- × Create a psychological safe environment
- × Smaller groups
- × Diversify the team
- × Add an element of competition

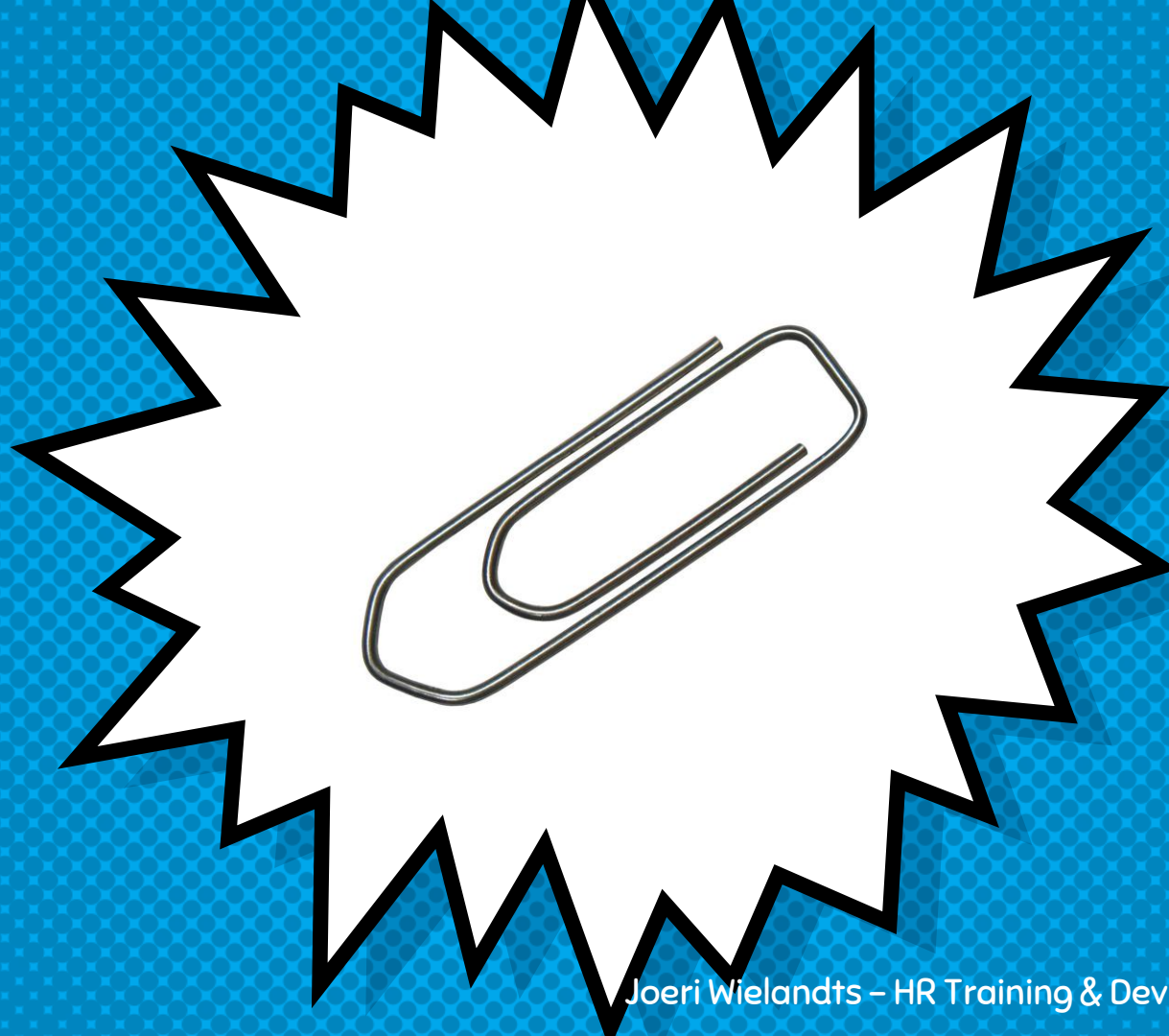


SOLUTIONS

- × Use more than one marker
- × **Brain writing**: during specific moment cease talking, write down your own ideas silently
- × **Nominal group technique**: after brain writing all ideas are explained to group and ranked by all individuals

PRINCIPLES

1. No criticism
2. Freewheeling welcome
3. Quantity desired
4. Combining/improving ideas encouraged

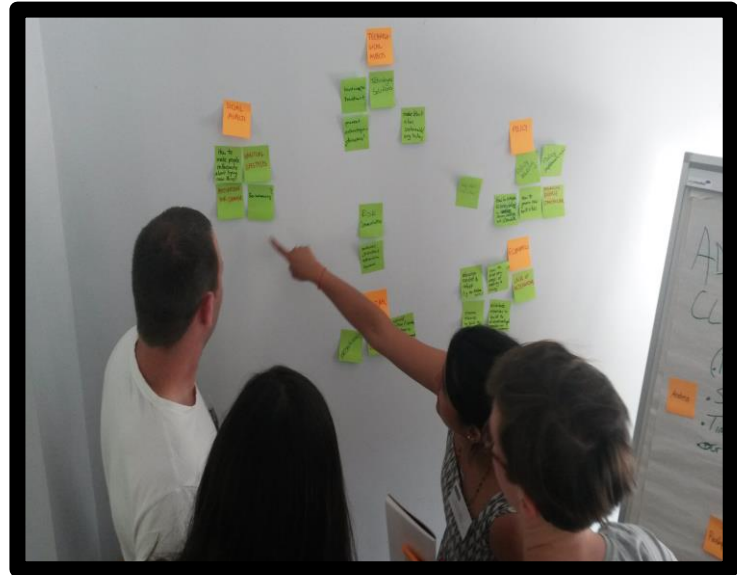


SOLUTIONS

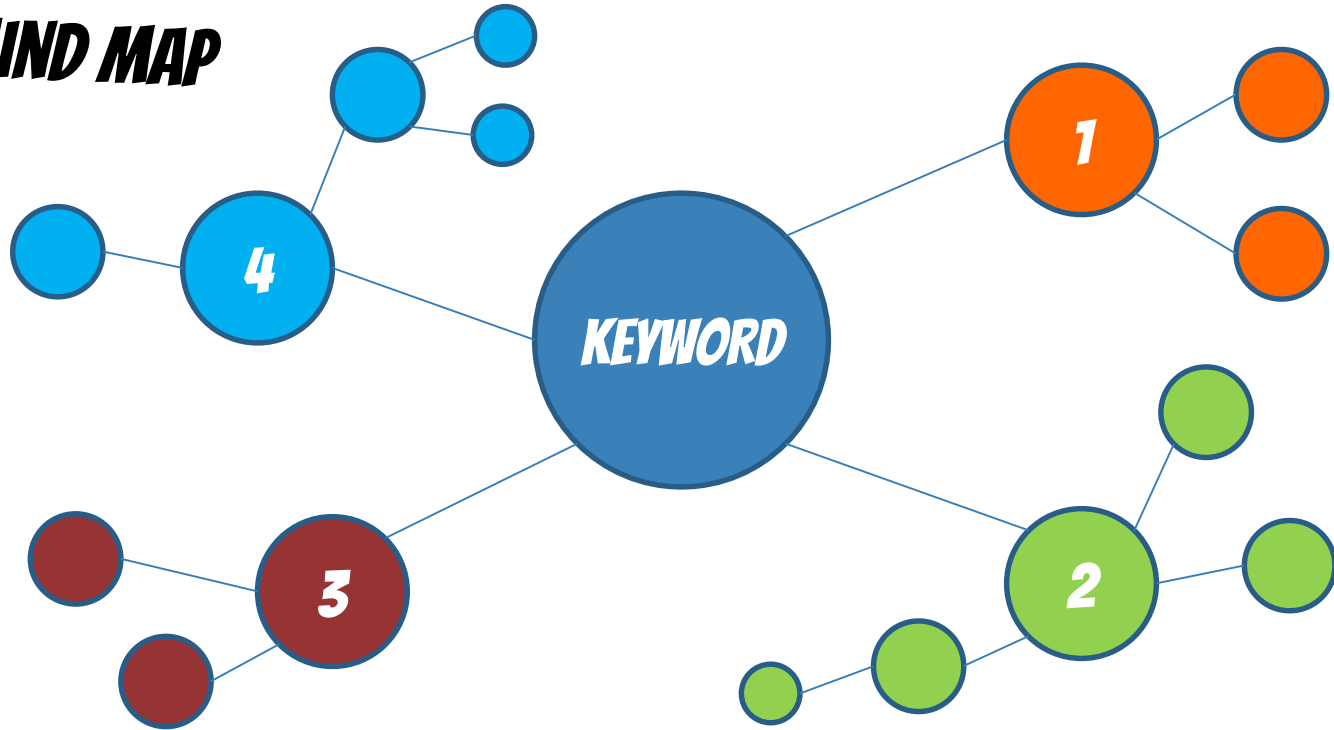
Structure brainstorming sessions using tools to organize & optimize brainstorm sessions

- × Ideas on a wall
- × Mind map
- × SCAMPER

IDEAS ON A WALL + DOT VOTING



MIND MAP





***PROBLEM
SOLVING***

DIFFERENT KINDS OF PROBLEMS

SIMPLE

Few possible causes

One of your first guesses is the solution

COMPLEX

30–50 possible root causes

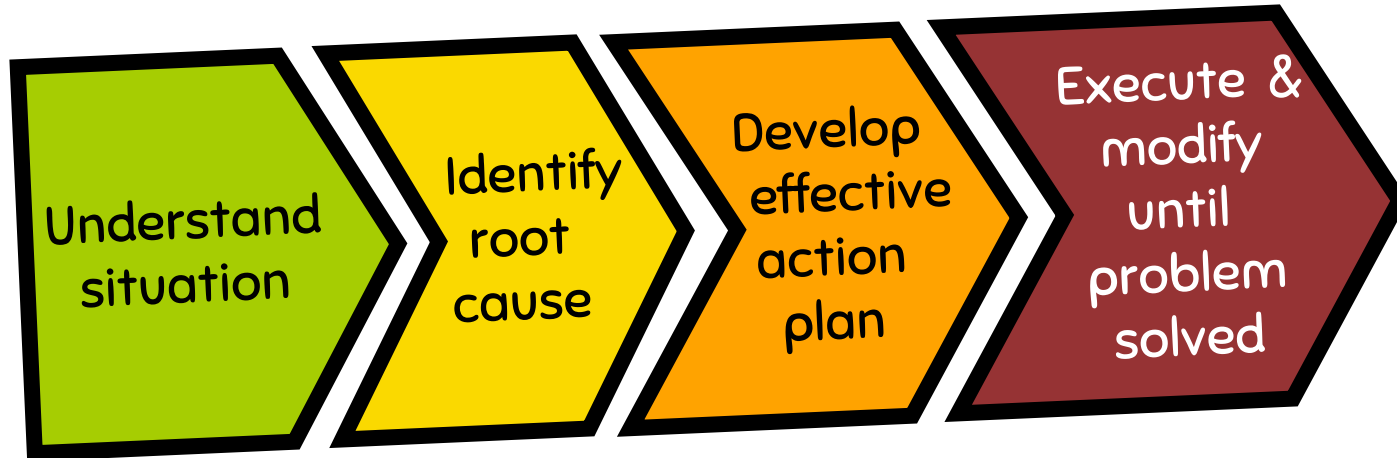
You can't guess all possibilities

HARD

100s or even 1000s of possible causes

There's no way you can guess the solution

PROBLEM SOLVING



EXAMPLE CASE: LECTURES

Some PhDs try to organize monthly lectures on a topic in their field. It's open to all other staff and master students, but after three interesting sessions, still only a handful of people attend.

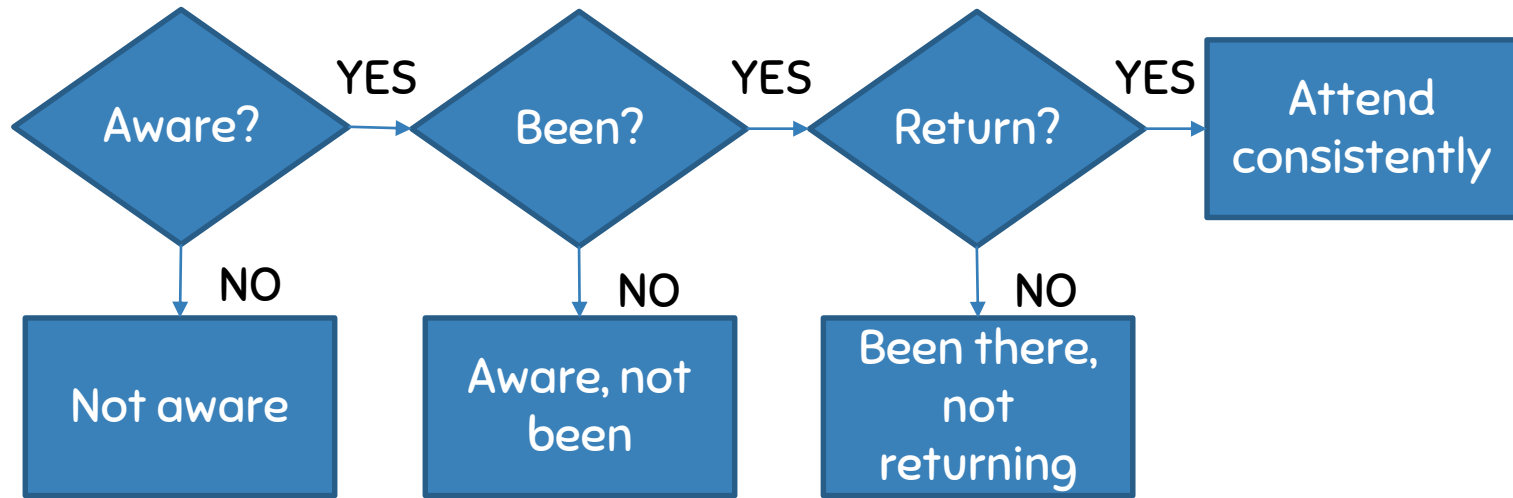
Why aren't more people attending?



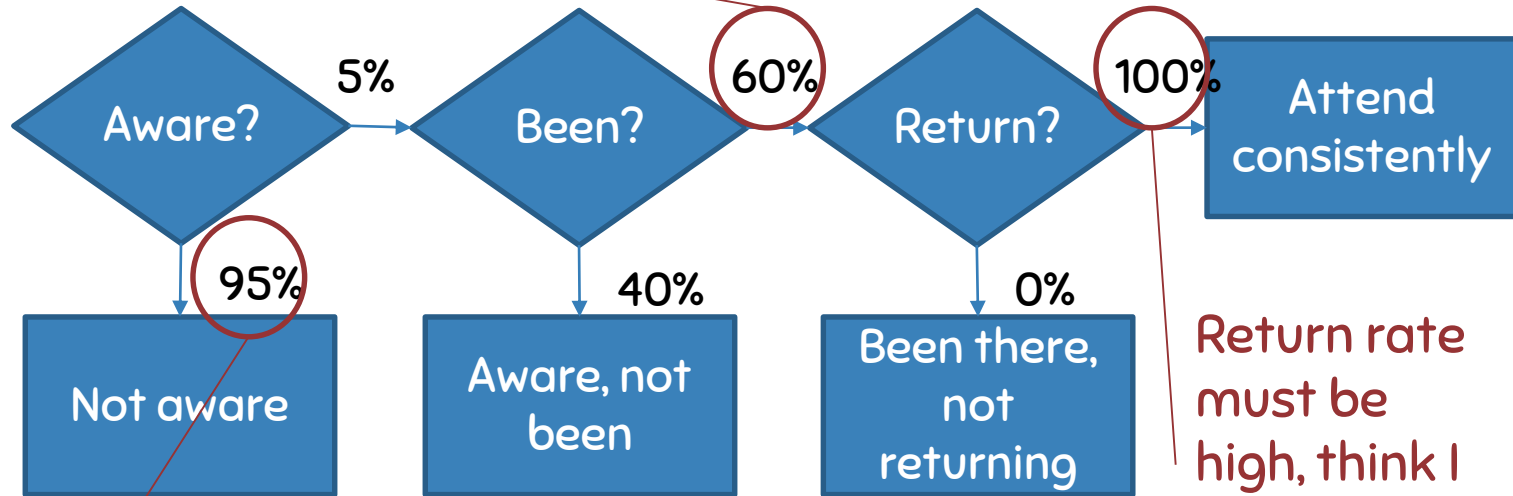
FROM DIAGNOSE TO SOLUTION

Understand situation and identify root cause(s)

1. List all the potential root causes
2. Develop a hypothesis for the likely root cause(s)
3. Determine analysis and info required to test hypothesis
4. Analyse & identify root cause(s)



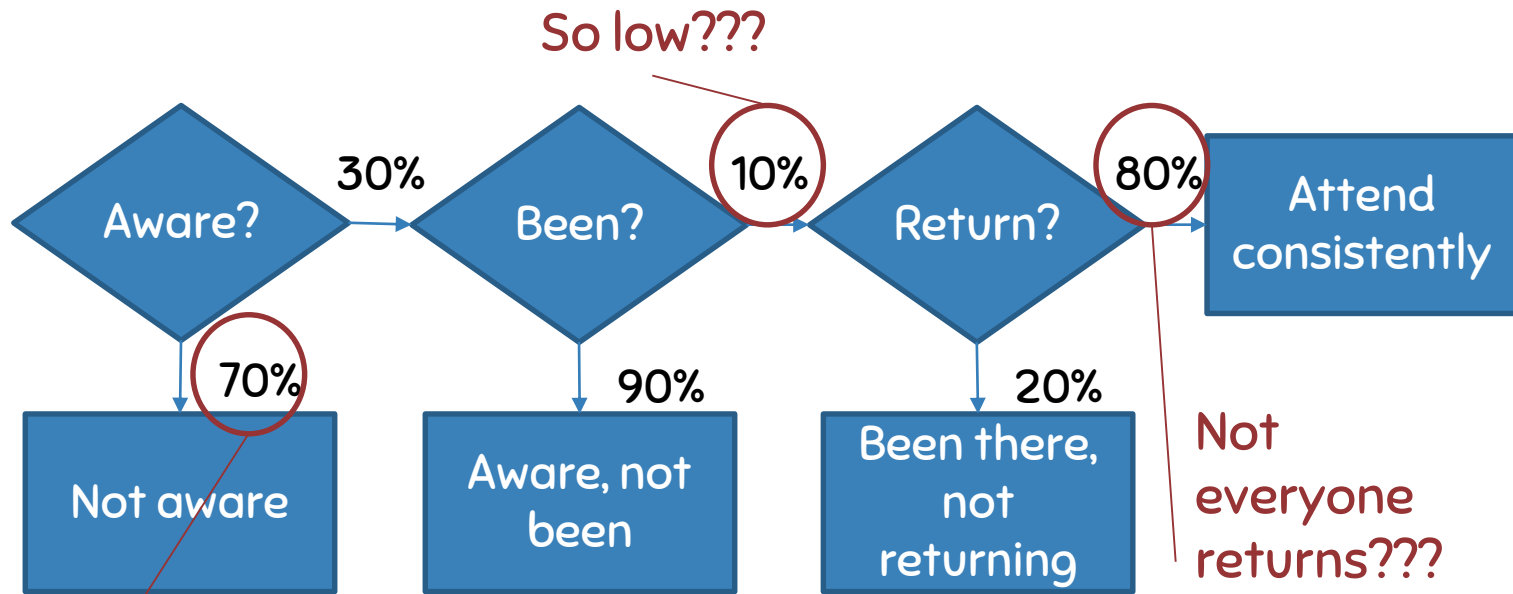
Not everyone's interested in lectures



We didn't really advertise this much

Return rate must be high, think I saw same faces

Issue	Hypothesis	Rationale	Analysis/ activity
How many (un)aware	Most are unaware	Didn't advertise	Organize survey
Why not coming	Don't like lectures	People who like lectures attend	Interview 5 who knew but didn't come
Want to keep coming	Yes	Seen familiar faces	Interview 5 who attended



Wow, word of mouth spreads fast!

EXAMPLE CASE: LECTURES

Root causes:

1. 70% doesn't know about lectures
2. There's other reasons why people don't come:
timing, don't know what to expect,...
3. Drop-outs complain about too long &
not interactive



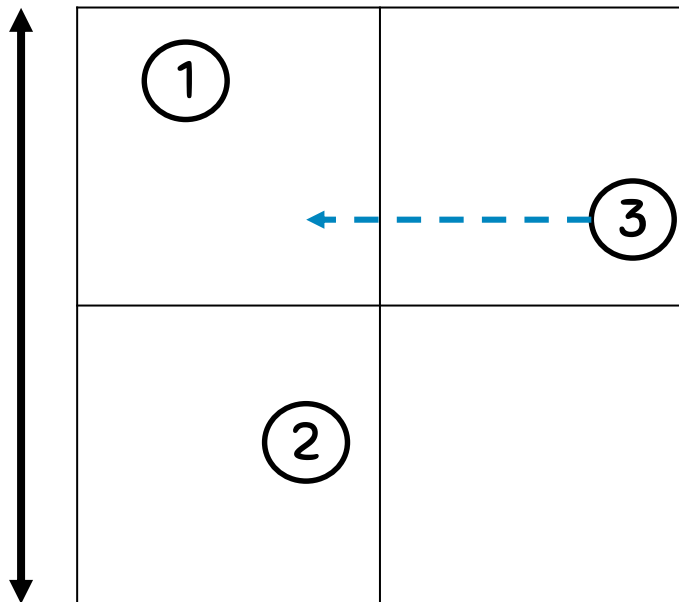
FROM DIAGNOSE TO SOLUTION

Develop action plan and execute

1. Develop a wide variety of solutions to solve problem
2. Prioritize actions
3. Develop implementation plan

Idea	Makes people aware?	Makes people want to attend?
Ask attendees to invite friends	+	+
E-mail	+	?
Website	±	+
...		

Impact



Ease implementation

PHOENIX LIST

- × Tool created by CIA
- × Helps 'smelling' the problem

VARIABLE ANALYSIS

- × 5 step structured approach
- × HARD problems



***CREATIVE
PROBLEM
SOLVING***

CPS: SAY WHAT?

CREATIVE

elements of
newness, innovation,
and novelty

PROBLEM

any situation that
presents a
challenge, offers an
opportunity,
or represents a
troubling concern

SOLVING

devising ways to
answer, to meet, or
to satisfy a situation
by changing self or
situation

ALEX F. OSBORN

- 1948 Your Creative Power
- 1953 Applied Imagination
Principles and Procedures
of Creative Problem-Solving

BBDO Advertising agency
Creative Education Foundation





You are not you when you're hungry - BBDO campaign for snickers (2012)
Joeri Wielandts - HR Training & Development, KU Leuven

SIDNEY J. PARNES

Professor, academic

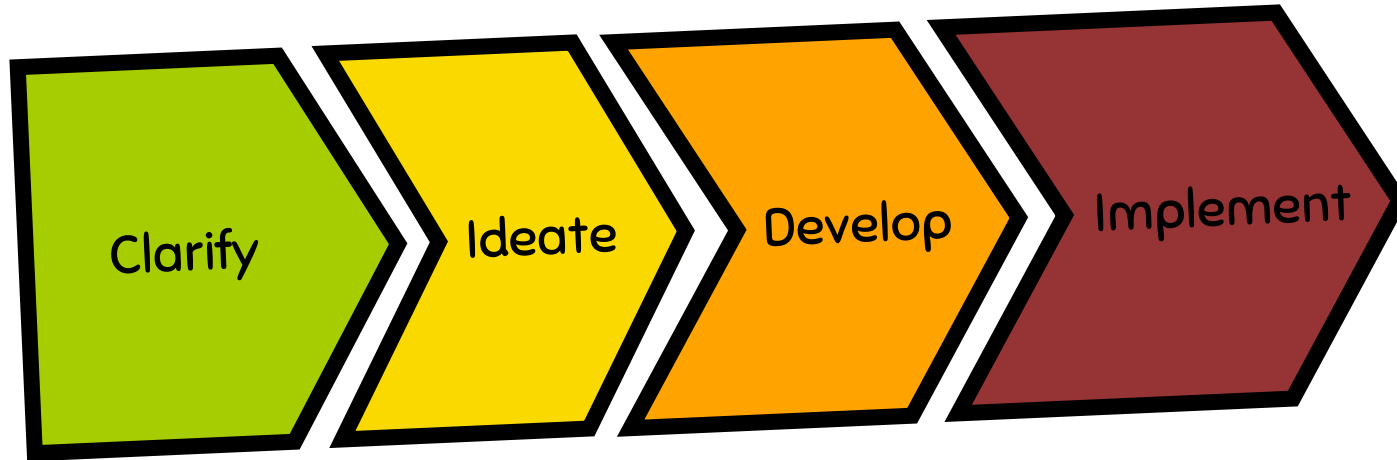
International Center for Studies in
Creativity

Gave CPS process scientific back-up

Creative Education Foundation



THE CPS PROCESS



DIVERGING < > ***CONVERGING***

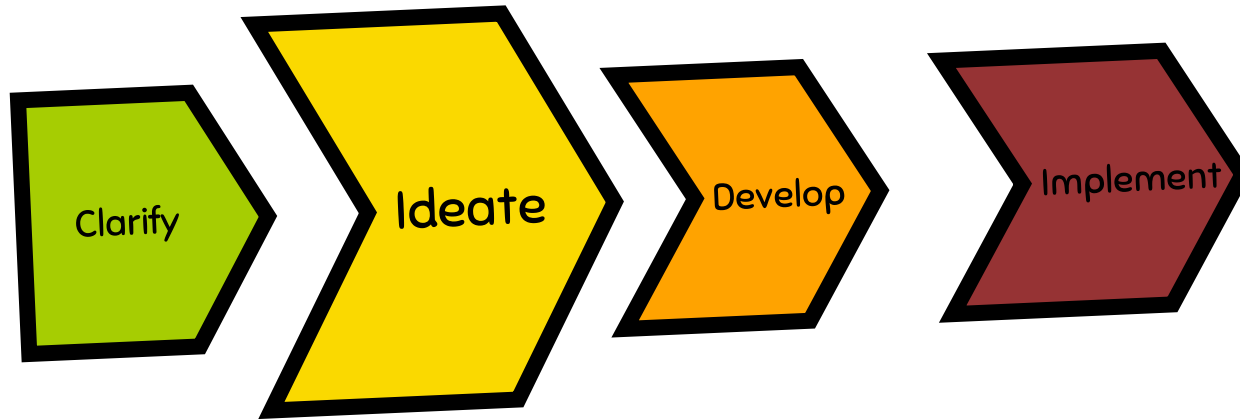
PRINCIPLES OF DIVERGING

- × Balance Divergent and Convergent Thinking
- × Ask Problems as Open-ended Questions
- × Defer or Suspend Judgment
- × Focus on “Yes, and” rather than “Yes, but”

PRINCIPLES FOR CONVERGING

- × Be deliberate: give every option a fair chance
- × Check your objectives: on track?
- × Improve your ideas: make ideas workable solutions
- × Be affirmative: think improving, not eliminating
- × Consider novelty: tailor, rework, tame

THE CPS PROCESS



3 LEVELS OF CREATIVITY TECHNIQUES

1. Prompting techniques
associative thinking
2. Checklist technique
SCAMPER
3. Forcing connections
random word, ideas in a box

PROMPTING TECHNIQUES (1/4)

Brainstorming

Combine the creative strength of multiple people
Associate on each other's ideas

Mind maps

Visual brainstorming technique
Great for recording & developing ideas

PROMPTING TECHNIQUES (2/4)

Analogies

Think of something similar

Example: NASA satellite and a yoyo

Visualization

Try summarizing a problem by sketching one or more images

PROMPTING TECHNIQUES (3/4)

Dumbest idea first

Hold a competition to find the dumbest idea. Select it. Then go through list of ideas to see if there's not useful in it after all.

What would X do?

Think of famous/historical/fictional/... people. How would they solve the problem? Which options would they consider?

PROMPTING TECHNIQUES (4/4)

10+10+10 associations

Generate 10 ideas, select one.

Find 10 new ideas based on that one.

Now select one from those 10 new ideas and find 10 more.

CHECKLIST TECHNIQUE

SCAMPER

Substitute

Combine

Adapt

Modify – Maximize – Minimize

Put to other use

Eliminate

Reverse – Rearrange

FORCING CONNECTIONS

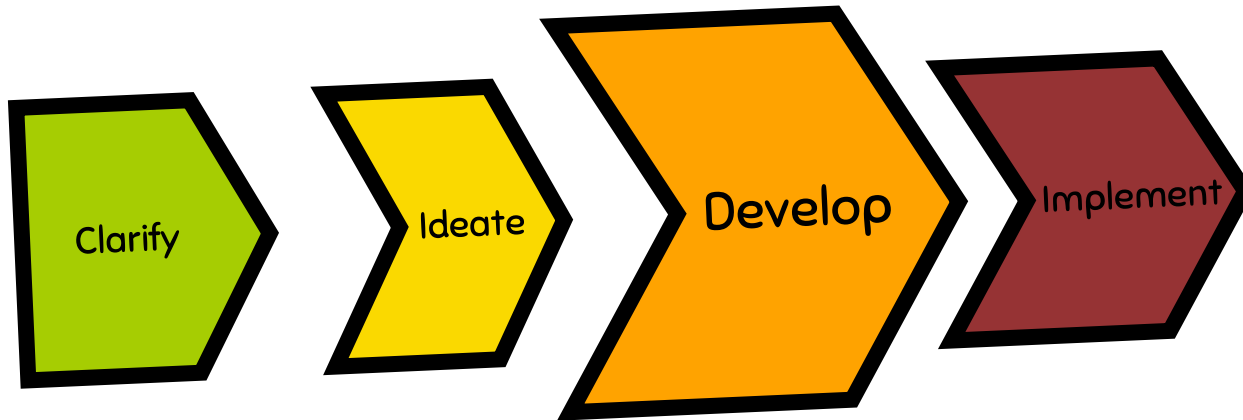
IDEAS IN A BOX

- × Prompts ideas by forcing together attributes and sub-attributes of a problem
- × Include unusual features

NOVEL APPROACH FOR DIAGNOSIS OF DISEASE

Disease	Microbial infection	Cancer	Auto immune	Cardio-vascular	...
Techniques exploited	Visual inspection	Biosensors	Culture of causative organism	Polymerase chain reaction	...
Materials made from	Plastic	Glass	Living	Organic	...
Communication info	LCD display	LED display	Smell	Vibration	...
...

THE CPS PROCESS



IMPROVING IDEAS: PPCO TECHNIQUE

- | | |
|--------------------|--|
| P luses | What are the advantages? |
| P otentials | Any extra positive things possible?
“It might...” |
| C oncerns | Phrase them as questions
“How can we ...” |
| O vercome | Find solutions for concerns one at a time |



EXERCISE

EXAMPLE CASE: LECTURES

Some PhDs try to organize monthly lectures on a topic in their field. It's open to all other staff and master students, but after three interesting sessions, still only a handful of people attend.

Why aren't more people attending?



EXAMPLE CASE: LECTURES

Root causes:

1. 70% doesn't know about lectures
2. There's other reasons why people don't come:
timing, don't know what to expect,...
3. Drop-outs complain about too long &
not interactive



STEP 1

Generate ideas

- × Visualize problem
- × Analogies
- × Dumbest idea
- × What would X do?
- × SCAMPER

STEP 2

Improve idea

- × PPCO

STEP 3

Communicate

- × Present results

Be creative in an organized way!

QUESTIONS?

LOOKING FOR MORE  ?

LITERATURE

- × Stop Guessing – Nat Greene
- × Problem Solving 101 – Ken Watanabe
- × The Houdini solution: Why Thinking Inside the Box is the Key to Creativity – Ernie Schenck
- × Simply Brilliant: powerful techniques to unlock your creativity and spark new ideas – Bernard Schroeder
- × The Myths of Creativity – David Burkus

LITERATURE

- × Effective Learning in the Life Sciences: How Students Can Achieve Their Full Potential – David Adams
- × The creative researcher. Tools and techniques to unleash your creativity – Kevin Byron
- × Groupthink: The brainstorming myth
<https://www.newyorker.com/magazine/2012/01/30/groupthink>
- × Improving the creativity of organizational work groups
[DOI: 10.5465/AME.2003.9474814](https://doi.org/10.5465/AME.2003.9474814)
- × Creative Education Foundation
<http://www.creativeeducationfoundation.org>

THANKS!



Joeri Wielandts

HR Training & Development – KU Leuven University

Contact: joeri.wielandts@kuleuven.be – LinkedIn

CREDITS

Special thanks to all the people who made and released these awesome resources for free:

- × Presentation template by [SlidesCarnival](#)
- × Photographs from [Unsplash](#)