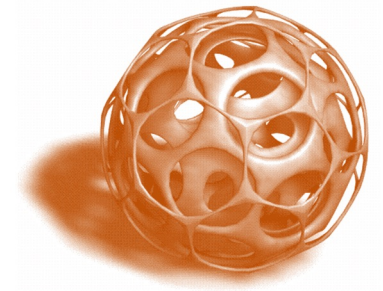


2DevelopCreativity

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Definition

- Creativity:
 - The ability to create something new and valuable;
 - Something new:
 - idea, a joke, an artistic or literary work, a painting or musical composition, a solution, an invention etc.).
 - Valuable, or better, translate to something we can:
 - make, think or feel (see, hear, smell, touch, taste, ...).
 - Is an ability, a mind skill, or a competence, equipping us to make something new, ideally in any domain.
 - Can be improved through several methods.

"Creativity
takes courage."

(Henri Matisse)

Models

Creativity a legacy of the evolution, allowed humans to quickly adapt to rapidly changing environments.

Graham Wallas and **Max Wertheimer**

in *Art of Thought* (1926), a 5-stage model:

- **i) *preparation***
 - preparatory work that focuses the mind and explores the problem's dimensions
- **ii) *incubation***
 - where the problem is internalized into the unconscious mind
- **iii) *intimation***
 - the "feeling" that a solution is on its way (sometimes considered a substage),
- **iv) *illumination or insight***
 - the creative idea bursts from preconscious processing into conscious awareness;
- **v) *verification***
 - where the idea is consciously verified, elaborated, and then applied.



Careful what
you think.

Models

James C. Kaufman and **Beghetto** introduced the Four C model:

- **i) mini c** - Transformative learning involving personal experiences;
- **ii) little-c** - Everyday problem solving and creative expression;
- **iii) Pro-C** - Exhibited by people professionally or vocationally creative
- **iv) Big-C** - Creativity with impact in a particular field, possibly also in others;
- "Big C" and "little c" are widely used also with variations:
 - Big-C/little-c - Kozbelt, Beghetto and Runco;
 - historical and personal creativity - Margaret Boden;
 - "high" and "little c" creativity - Craft;
 - "high" and "democratic" creativity - Ken Robinson; ...
 - Primary and secondary creativity - Maslow



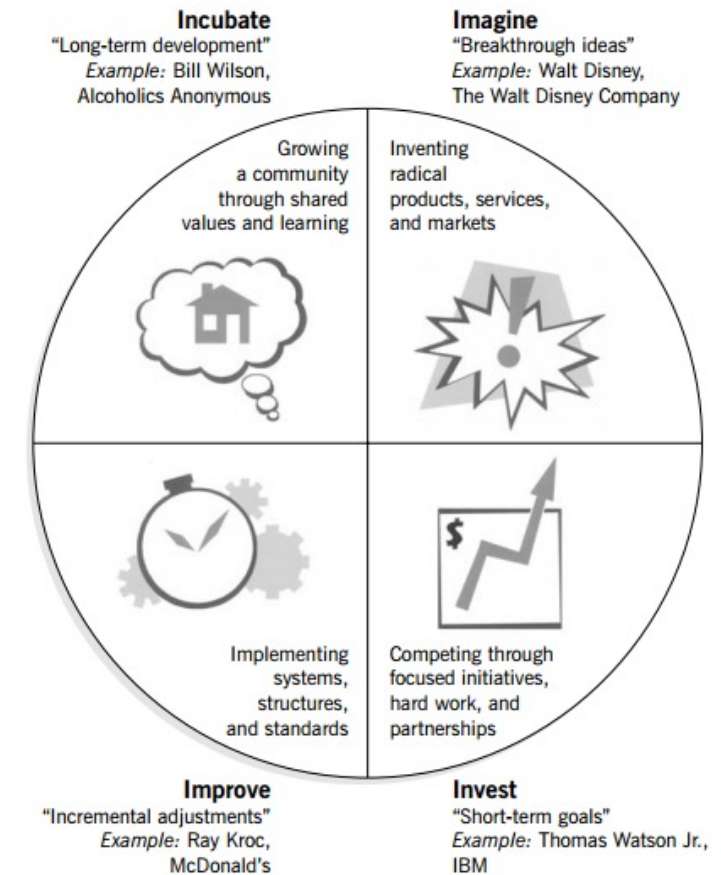
Profiles

DeGraff and **Lawrence (2002)** introduced the Four I profiles:

- **i) Incubate** - Long-term development;
- **ii) Imagine** – Breakthrough ideas;
- **iii) Improve** - Incremental Adjustments;
- **iv) Invest** - Short term goals.

Jeff DeGraff
Katherine A. Lawrence

**Creativity
at Work**



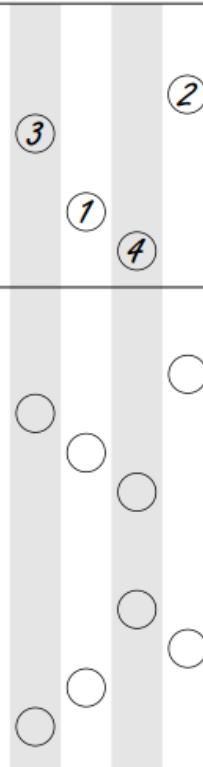
Profiles

For each question, rank the four answers according to which is most like you and which is least like you. A rank of 1 means that this characteristic *best* describes you. A rank of 4 means it *least well* describes you. Total each column, and then subtract your totals from 25 to obtain your final score for each profile.

Step 1:
Rank each set
of answers

Example. When I wake up in the morning, I . . .

spend time with my family.
brainstorm about the day's activities.
get to work immediately.
review my plans for the day.



11. When solving a problem I . . .

take time to find a solution that matches my values.
enjoy exploring all options.
prioritize short-term goals.
collect data.

12. I would describe myself as . . .

systematic.
supportive.
driven.
flexible.

13. I work on projects that . . .

will be completed quickly.
let me invent something new.
create practical improvements.
I can learn from.

14. As part of a team, I bring an ability to . . .

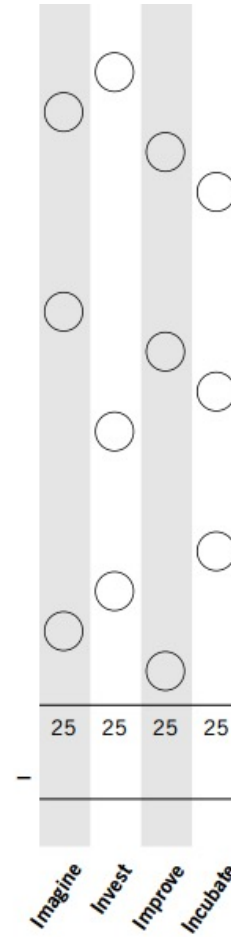
change direction as needed.
keep focused on our process.
foster communication.
get the job done.

15. The most important part of my job is . . .

working with others.
focusing on a specific objective.
thinking up new possibilities.
making systems run smoothly.

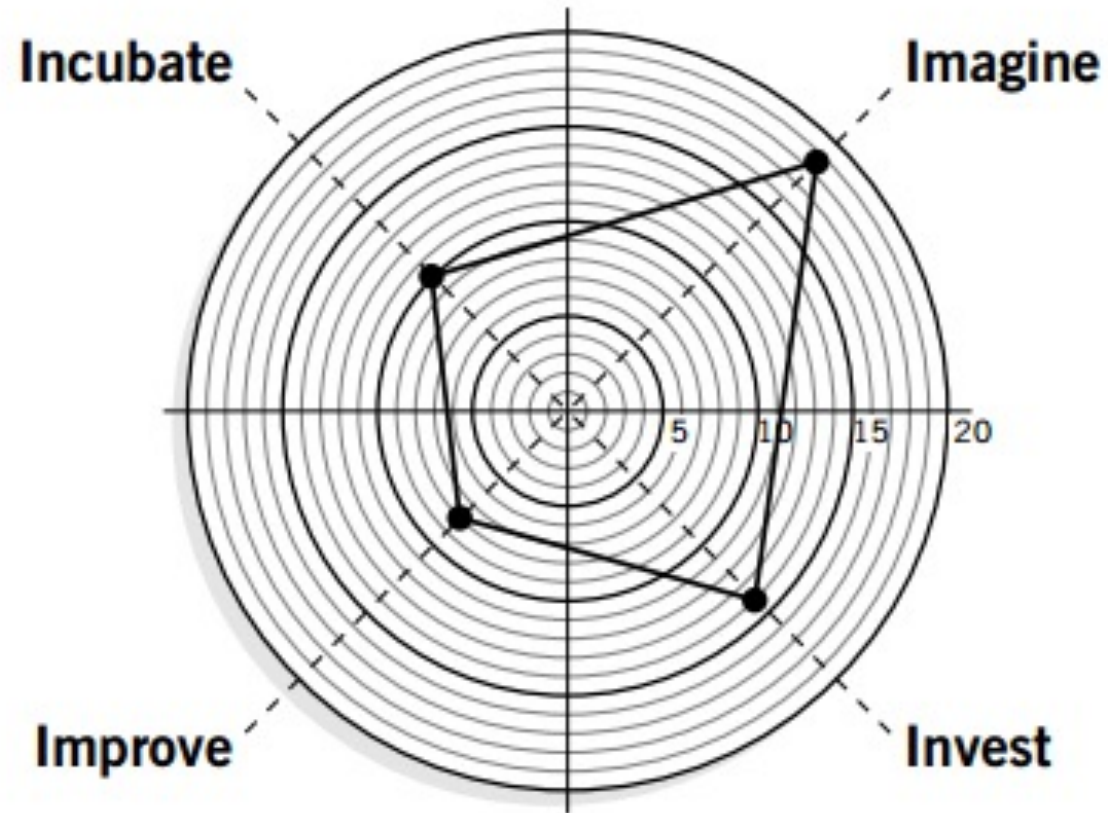
Step 2: Total each column. →

Step 3: Subtract each total from 25.
The higher your score for any one profile, the more strongly you favor that profile.



Profiles

Example of creativity map with assessment:



Profiles

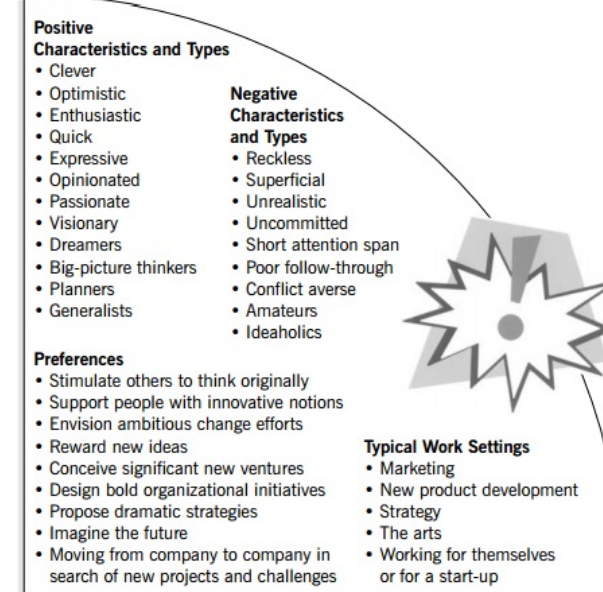
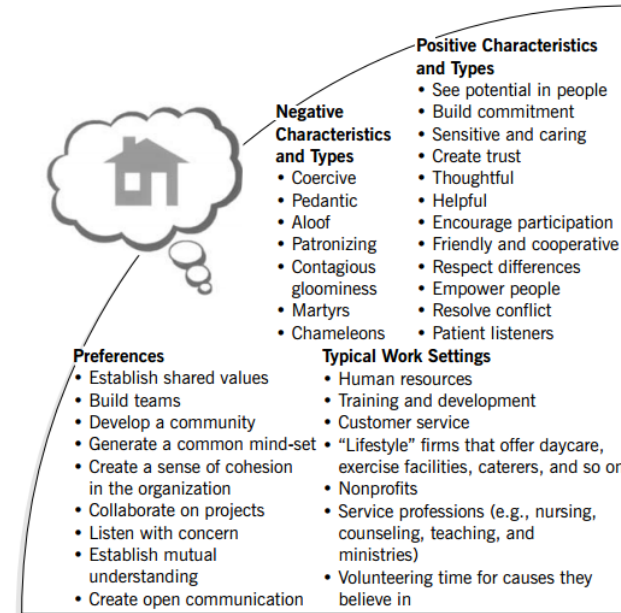


Figure 2.6. People in the Imagine Profile

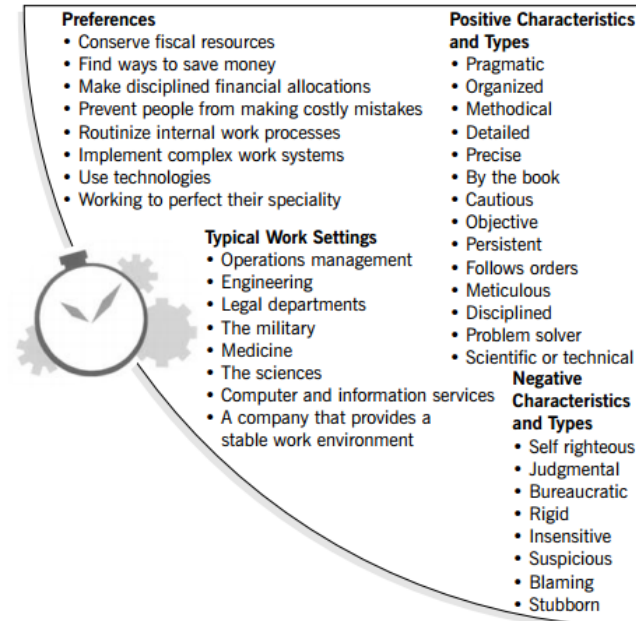


Figure 2.8. People in the Improve Profile

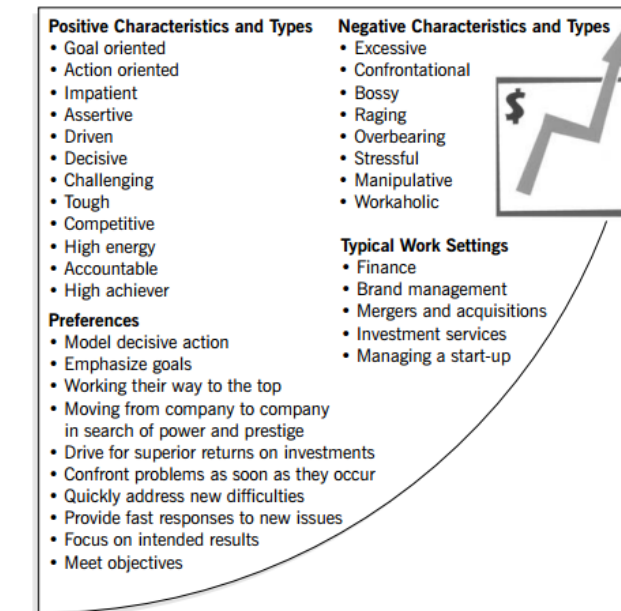
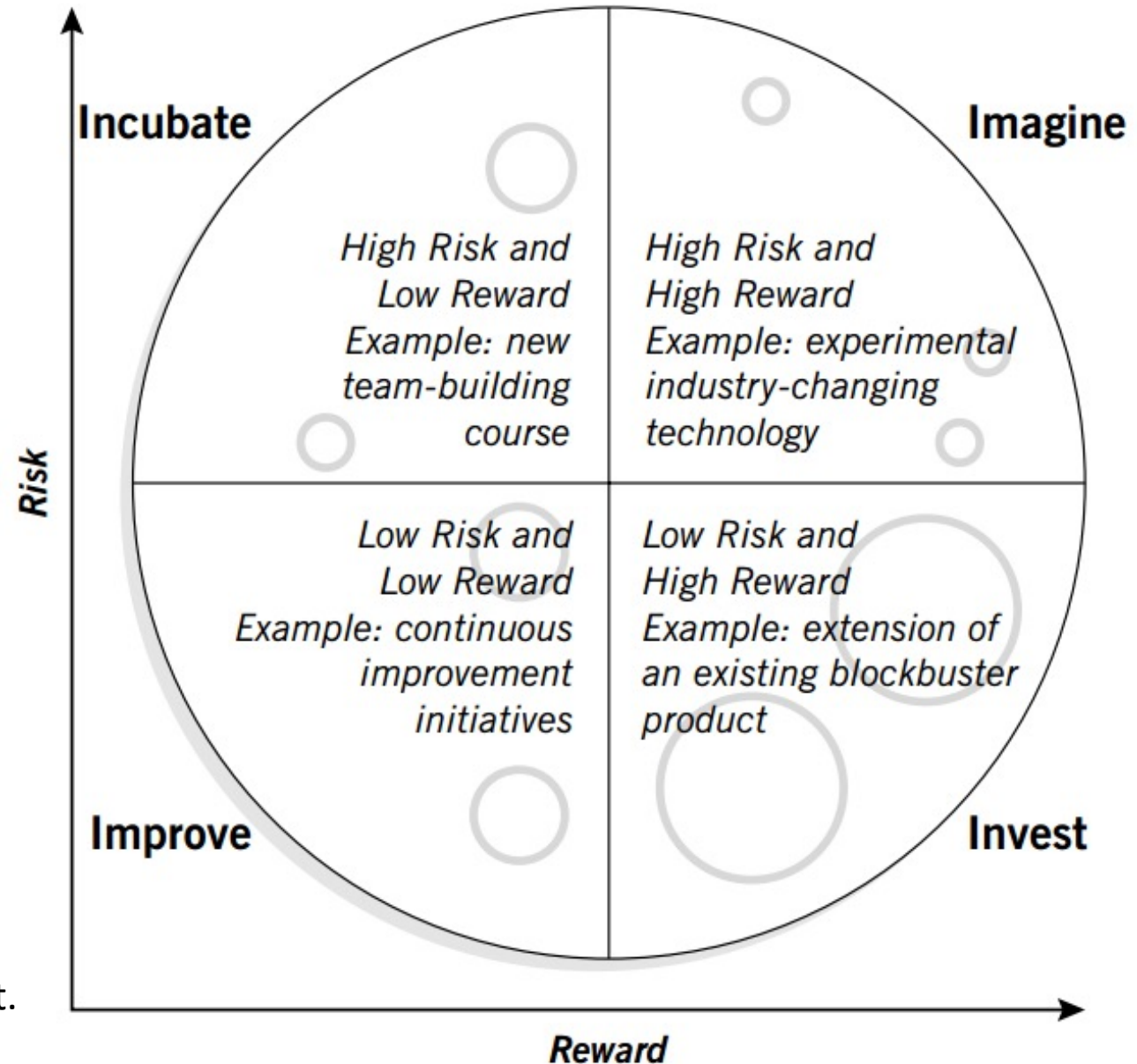


Figure 2.7. People in the Invest Profile

Profiles



Life is full
of creativity



and you,
too!

Creativity expressions

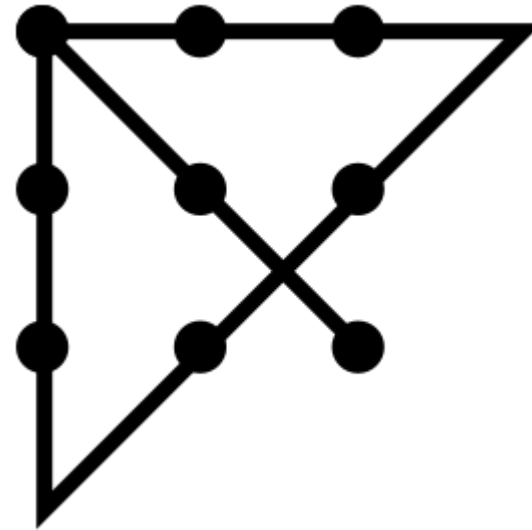
- **Think Outside the Box** - Nine Dot Problem to connect with 4 lines.



It seems difficult because people generally imagine a boundary, a box on the dots.
The heart of the matter is to forget about the box.
Ironically, telling people to "think outside the box" does not generally help.

Creativity expressions

- **Think Outside the Box** - Nine Dot Problem to connect with 4 lines.



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The heart of the matter is to forget about the box.
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Creativity expressions

- **Eureka moment, or aha! Moment** - Common human experience of suddenly understanding a previously incomprehensible problem or concept

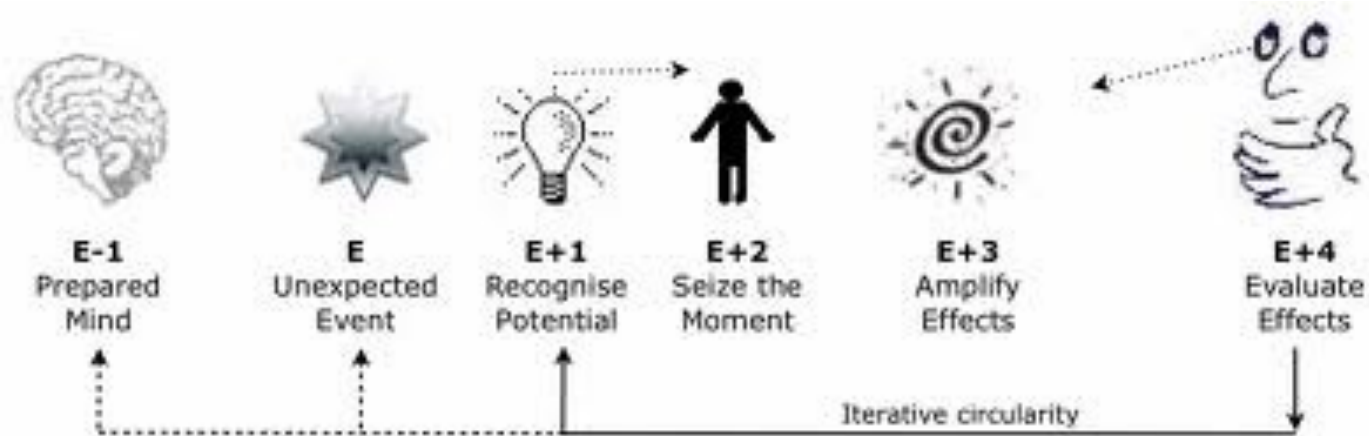
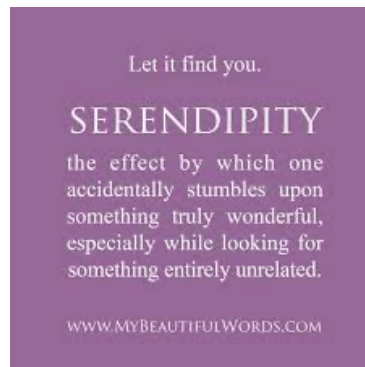


Archimedes of Syracuse was asked by the king to detect whether a crown was pure gold, or if silver was had by the goldsmith.

During his trip to the public bath, he noticed that water is displaced when his body sinks into the bath, and finds a method to obtain the volume of the crown.

Creativity expressions

- **Serendipity**



Creativity expressions

- **Serendipity**

Serendipity in Science

In *Serendipity: Accidental Discoveries in Science*, Royston Roberts has gathered together dozens of examples of serendipity:

- Columbus discovering the New World;
- Edward Jenner and the vaccination for small pox;
- Velcro, penicillin, X-rays, Teflon, dynamite, and the Dead Sea Scrolls, what have those in common?
- Serendipity! Were discovered by accident,

**Serendipity is
not an
accident**



Tools to develop creativity

- Generate: Brainstorming, brain design, Mind maps, lateral thinking, analogies, SCAMPER...
- Evaluate: 6 hats, superheroes, portfolios, vote, consensus, multi criterium matrix, atributs list ...



Tools to develop creativity



Brainstorming

A powerful technique to generate ideas and solving problems.

- Brainstorming encourages free thinking and allows all ideas without judgment. Teams or individuals come together to creatively explore solutions.
- The goal is to generate a multitude of ideas, even if some seem unconventional or “out there.”

Main rules and steps for brainstorming session:

1. **Set Clear Goals and Objectives:** Define the purpose of the brainstorming session. What problem are you trying to solve? What ideas do you need? A clear focus ensures that participants stay on track.
2. **Be Inclusive and Accommodating:** Encourage everyone to participate. Create an inclusive environment where all voices are heard. Avoid dominating the discussion or dismissing ideas prematurely.
3. **Choose the Right Environment:** Select a comfortable and conducive space for brainstorming. A relaxed setting encourages creativity. Consider using tools like whiteboards, sticky notes, or digital collaboration platforms.
4. **Break the Ice:** Start with a warm-up activity or an icebreaker question. This helps participants feel more comfortable sharing their thoughts. Icebreakers can be as simple as asking about their favorite book or travel destination.
5. **Appoint a Facilitator:** Designate someone to lead the session. The facilitator ensures that the rules are followed and keeps the discussion on track. Their role includes timekeeping, summarizing ideas, and encouraging active participation.
6. **Prepare Notes and Prompts:** Create a problem statement or frame the challenge you’re addressing. Use prompts or questions related to the problem to guide the brainstorming process.
7. **Aim for Quantity Over Quality:** Encourage participants to generate as many ideas as possible. Quantity breeds creativity. Avoid evaluating or critiquing ideas during the initial brainstorming phase.
8. **Visualize Ideas:** Make the session visual. Use charts, diagrams, or mind maps to organize ideas. Visual representations help participants see connections and patterns.
9. **Collaborate and Have Fun:** Build upon each other’s ideas. Encourage collaboration and cross-pollination. Keep the atmosphere positive and enjoyable. Creative thinking thrives in a fun environment.



Tools to develop creativity

Brain writing

- **Brainwriting** is similar to **brainstorming** but with ideas **written down** rather than verbally shared.
- Participants independently contribute with ideas by writing them down.
- Contributions are then shared with the group and sometimes clustered and combined.



Comparing Brainstorming and Brainwriting:

- **Participation and Engagement:**
 - Brainwriting ensures equal participation, benefiting introverted team members.
 - Brainstorming can lead to the dominance of a few vocal participants, potentially overshadowing others.
- **Idea Generation:**
 - Brainwriting builds upon ideas through individual rounds, promoting a wider range of creative solutions.
 - Brainstorming sparks creativity through spontaneous open discussion.
- **Time Efficiency:**
 - Brainwriting is more time-efficient, with simultaneous engagement and easy documentation.
 - Brainstorming can be time-consuming due to sequential idea sharing and tangential discussions.
- **Group Dynamics:**
 - Brainwriting lacks the energy of face-to-face interactions.
 - Brainstorming leverages direct communication and group synergy, energizing the process.



[More details:](#)

[Brainwriting vs. Brainstorming: A Detailed Comparison \(boardmix.com\)](#)

[Brainwriting 101: how to unlock new, innovative ideas - MindManager Blog](#)

Tools to develop creativity

Brain design

- Intentional shaping of our thought processes and cognitive patterns to enhance creativity, problem-solving, and innovative thinking.

May use several methods:

1. **Mindfulness:** Cultivate awareness and focus.
 2. **Divergent Thinking:** Generate multiple solutions.
 3. **Cross-Disciplinary Learning:** Explore diverse fields.
 4. **Challenge Assumptions:** Question conventions.
 5. **Learn from Failure:** Embrace setbacks.
 6. **Creative Habits:** Establish routines.
 7. **Collaboration:** Build on others' insights.
- Brainstorming and Brain Writing spark initial ideas, while brain design encompasses broader strategies for nurturing creativity and innovation.



Tools to develop creativity

• Design thinking

- A powerful problem-solving approach that emphasizes empathy, creativity, and iterative development, it is a human-centered approach to innovation.
- Fosters creativity, collaboration, and iterative problem-solving and Integrates diverse perspectives and disciplines.

Design thinking can be structured in five main stages:

1. Empathize:

1. **Research your users' needs** deeply. Understand their pain points, desires, and motivations.
2. Engage in observations, interviews, and immersion to gain empathy.
3. Empathy sets the foundation for user-centered design.

2. Define:

1. **State your users' needs and problems** clearly. Synthesize the research findings.
2. Reframe the problem in a human-centric way.
3. Define a specific challenge that guides the rest of the process.

3. Ideate:

1. **Challenge assumptions and create ideas.** Generate a wide range of solutions.
2. Use brainstorming sessions, mind mapping, and creative techniques.
3. Encourage wild, unconventional thinking.



Tools to develop creativity

4. Prototype:

1. **Start to create solutions.** Build low-fidelity prototypes.
2. Experiment with different concepts and designs.
3. Prototyping allows you to visualize ideas and gather feedback.

5. Test:

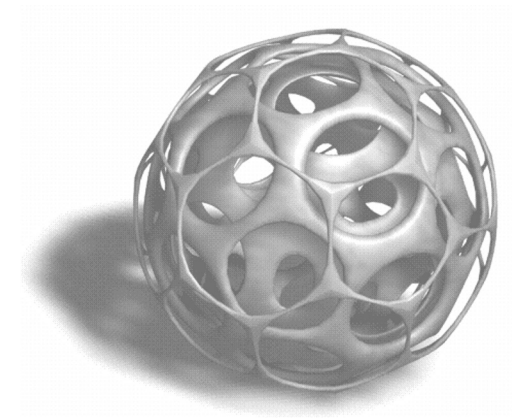
1. **Try your solutions out** with real users. Collect feedback.
2. Iterate based on insights from testing.
3. Testing ensures that your solutions address user needs effectively.



Tools to develop creativity

- **SCAMPER:**

- List of questions based on actions to generate ideas :
- 1st: Identify the project or the process
 - **S** (substitute?),
 - **C** (combine?),
 - **A** (adapt?),
 - **M** (magnify?),
 - **P** (put other uses?),
 - **E** (eliminate or modify?),
 - **R** (rearrange? or reverse?).





The way to get good ideas is to get lots of ideas,
and throw the bad ones away.

Dr Linus Pauling



Challenges for you

- Make a document stating:
 - What is creativity for you?
 - What do you think is your profile, according to the 4 Is profile, from DeGraff and Lawrence, do it before you try the test?
 - Make the DeGraff and Lawrence test and comment on the profile result.
 - How do you relate with the provided characteristic of the profile.
- Make a mind map about your personal strategy to develop creativity
- Try the SCAMPER tool with an object, a project or a process
- Finally write what you have learned with this tool and be creative.
- If you like, write a story inspired in your learning and share it with us and with your friends and family.





“CREATIVITY IS CONTAGIOUS, PASS IT ON.”

© Lifehack Quotes

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Web and sources of the images used in the document:

-- <http://creativeside.wordpress.com/2009/08/15/careful-what-you-think/>

- <http://trololoblog.blogspot.de/2012/01/barco-wallpaper.html>

- <http://cdn-media-1.lifehack.org/wp-content/files/2013/12/quote-Albert-Einstein-creativity-is-contagious-pass-it-on-254503.png>

- <http://billstainton.com/stainton/wp-content/uploads/2015/06/question-mark-to-light-bulb.jpg>



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This deliverable has been created as a part of the project CIP "Culture InnoPreneurship - Innovation, Entrepreneurship, Digitalisation and Facilitation Competences for Culture Professionals", coordinated by Landkreis Kassel (Germany) in partnership with Aristotelio Panepistimio Thessalonikis (GR), blinc (Germany), Federation For European Storytelling (BE), Instituto Politecnico de Leiria (PL), Smart Revolution (Italy); Storytelling Centre (NL), from 1st November, 2021 to 30th April, 2024 funded by the European Union under the Erasmus+ Programme, under the contract number: 2021-1-DE02-KA220-ADU-000028285.