



Exploring New Technology's Meaning for a Sustainable Future via Collaborative Science-Fiction Prototyping: A Novel Method for the Engineering Curriculum

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Mercedes-Benz

The best or nothing.

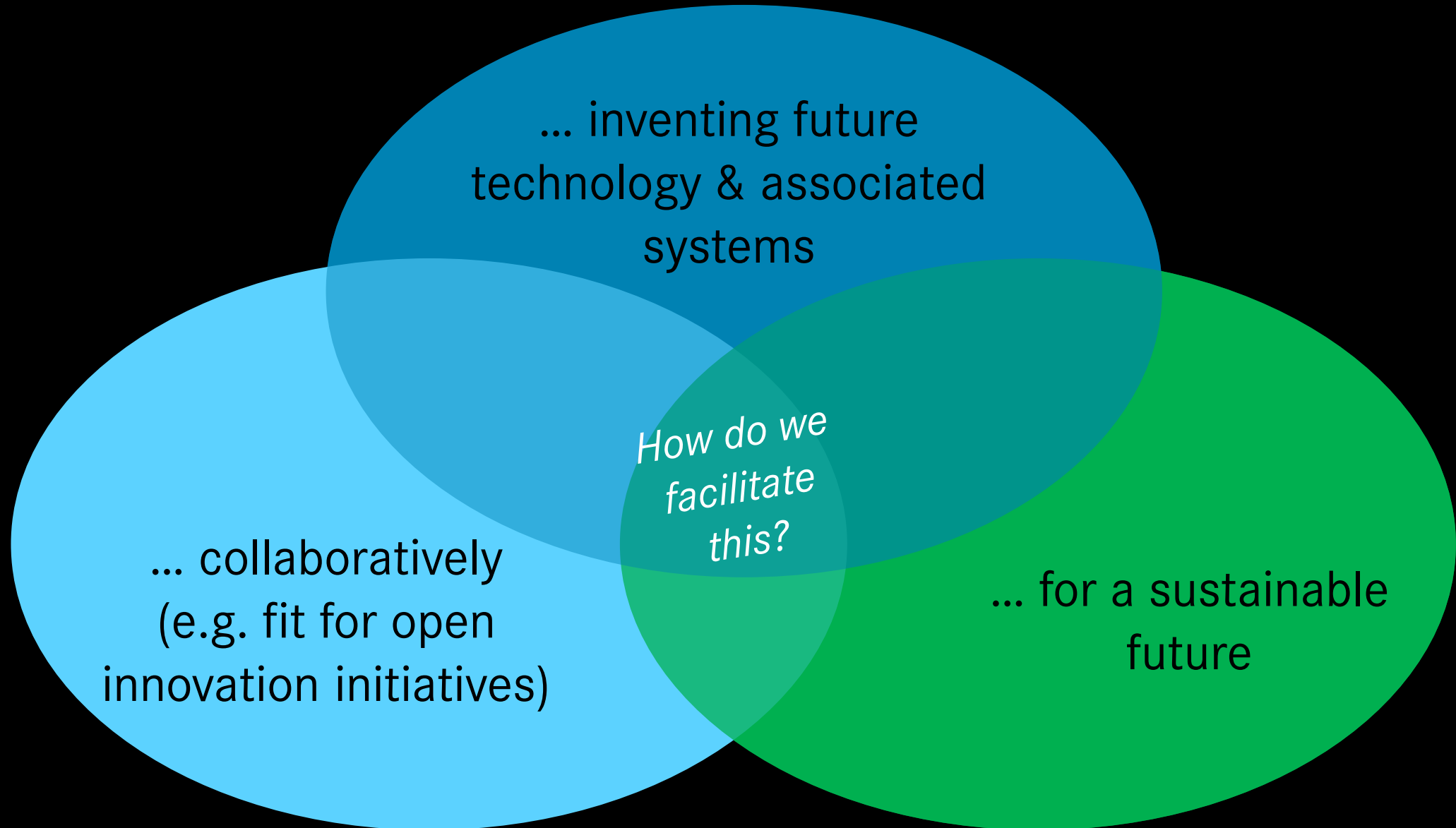


Enabling new generation of engineers to engage in sustainability-focused R&D: A collaboration between universities, industry and society



Source: <https://arena2036.de/de/>

What's needed? The new (VUCA) world necessitates new skills



Our approach: Adapting the Collaborative, Game-based Science-Fiction Prototyping method to requirements of a university course



Design of the Study: Offering tested as „practical course“ in engineering & technology management curriculum

Participants:

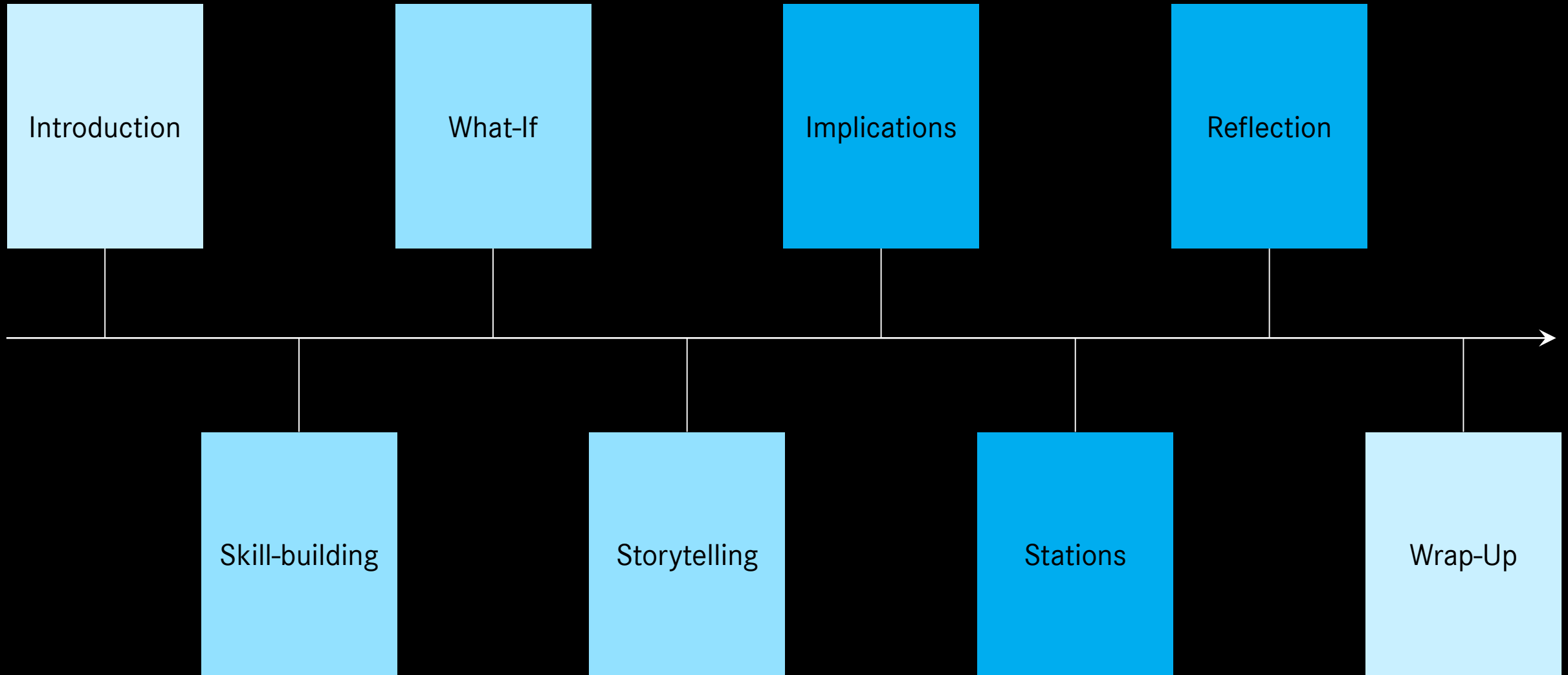
- 13 master's students
- 21-27 years old
- 85% male, 15% female

Evaluation via:

- Audio recordings
- Post-workshop survey



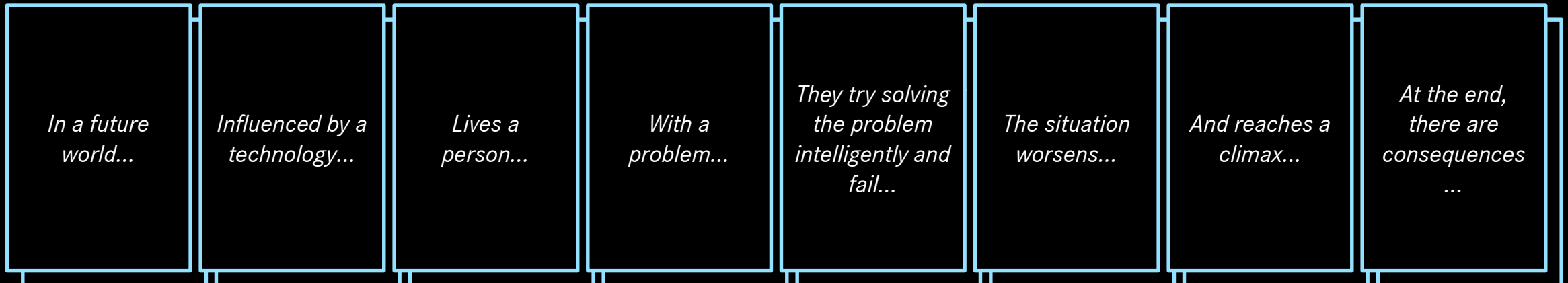
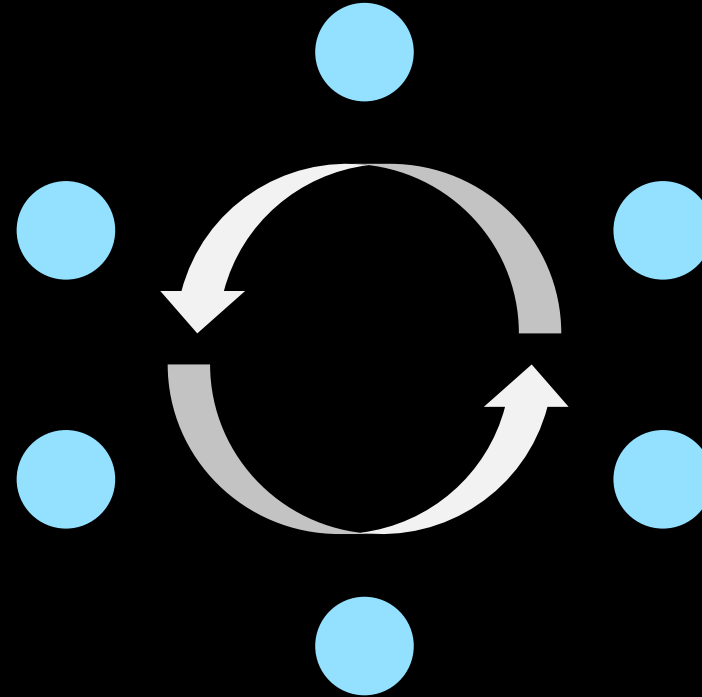
Design of the workshop: One day, 8 stages



Deep Dive: Storytelling technique



=



Results A: Effects of Design Changes 1/3

Emergent storytelling vs. enforcing the game mechanic

Participant 5: “If the communication center breaks down, we’ll have a real problem...”

Participant 6: “But just as in old movies, someone will have an old satellite phone or use a phone booth.”

Participant 7: “And then your giraffe can call you.”

Participant 5: “Yes, because it’s from the first generation, they still have that functionality.”

Participant 4: “And they are keeping them, because they are so cute, you don’t throw them away.”

Participant 7: “And for sustainability reasons! You don’t throw it away, you use it. When they’re broken, you recycle them and take every part out. “

Participant 6: “And cobbled together like patchwork. ... and you can see it’s first generation from the yellow color. Because most are yellow, blue, because they are cobbled together from different robots.”

Results A: Effects of Design Changes 2/3

Playing vs. executing tasks

Participant 1, reading the question from the card: “When does he/she notice for the first time, that this represents a problem for them?”

Participant 2: “When did we first notice this?”

Participant 3: “Yes, we already noticed it now.”

Results A: Effects of Design Changes 3/3

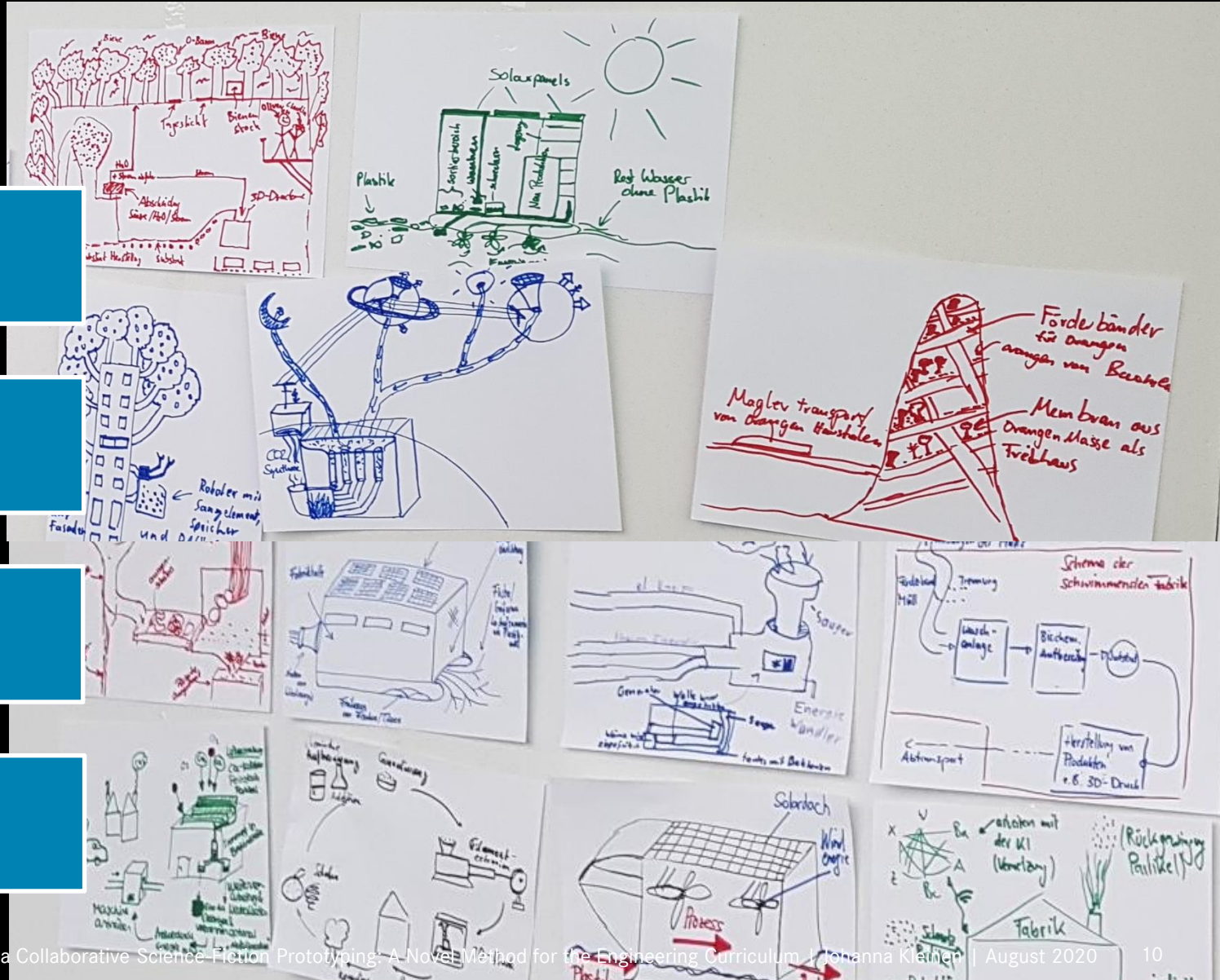
Extra Tasks

Writing Diary

Sketching Blueprints

Sketching Timeline

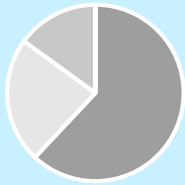
Discussion of improvements



Results B: Evaluation of the survey

... as a university teaching method

Would you recommend the format?



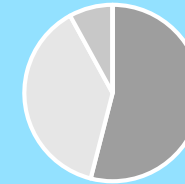
■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

“applies completely” “absolutely does not apply”

And 85% of the participants completely agreed that they could actively participate

... as a sustainability-and-society-focussed method

Does the format create a frame within which one can talk about societal challenges?



■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

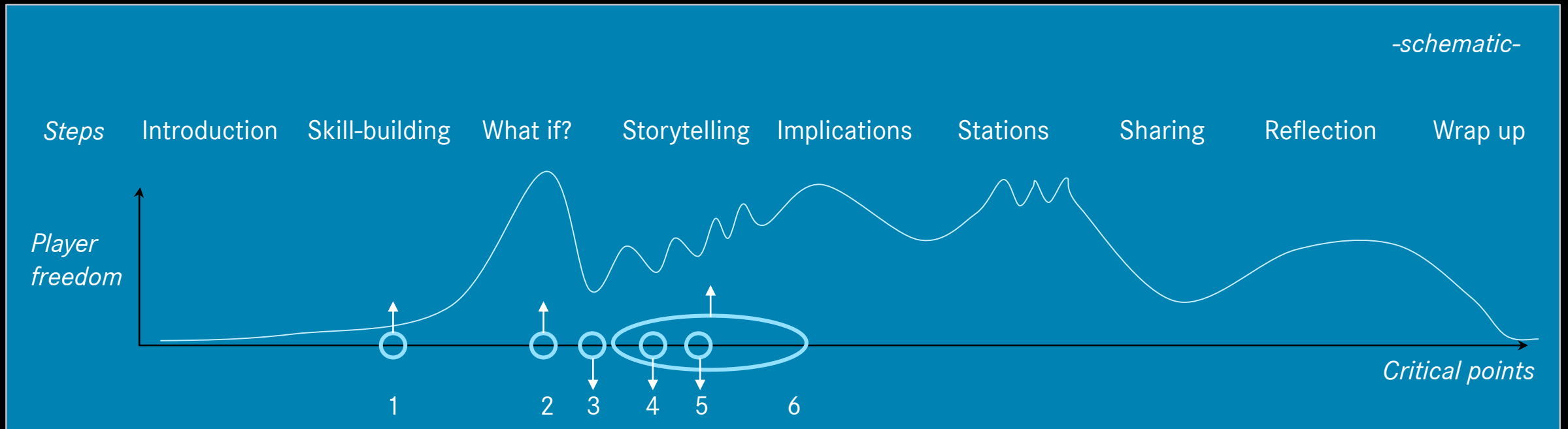
“applies completely” “absolutely does not apply”

... as a collaborative method

... as an innovation method

Results C: Guidelines for practitioners

Balancing participant agency and fixed structure through facilitator guidance



Thank You



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