Visualising real-time social network data to promote healthcare teamwork

Team-technology interaction as trigger to a digital intervention's acceptance and transferability

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Human Factors and Ergonomics Society – EUROPE CHAPTER "Enhancing Safety Critical Performance"

Turin, Italy, 21.04.2021

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 847386.

Teamwork in the healthcare sector

Quality of teamwork is key due to:

- complexity
- variety
- interdisciplinarity
- specialisation

Teamwork quality impacts on:

- healthcare workers' performance
- patients' health, safety, and satisfaction
- quality of delivered healthcare service
- healthcare system costs

- Molleman et al. (2010): interaction behaviours between specialist clinicians during multidisciplinary clinical meetings correlate with ability to approach the complexity of patients' care needs
- Ervin et al. (2018): information sharing is key for work performance within intensive care units
- Schmutz et al. (2019): teamwork positively influences performance of healthcare organisations, which should take this into account for the benefit of their patients
- Fowler et al. (2021): effective communication in nursing teams is associated with job satisfaction and patient care quality

A software-based intervention for teamwork

Sociomapping © by QED A.S.

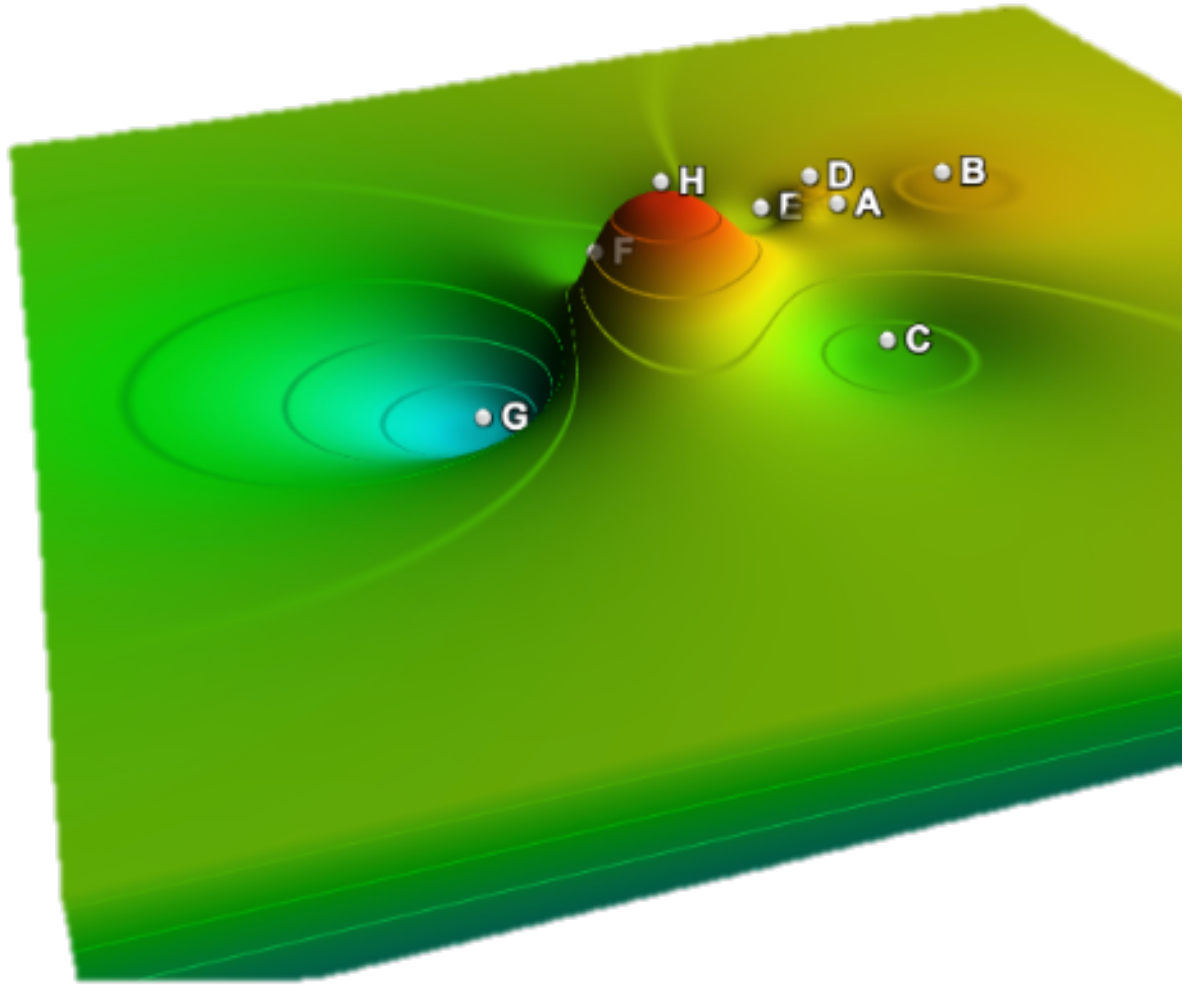
- Grounded on Social Network Analytical Theory (e.g., Moreno's Sociogram) and Team Coaching

- Applied in various sectors like military, aerospace, education, sport

Aim: To develop team awareness and action plans to promote desired team communication patterns.

The height/colour represents the average score received by one team members considering the responses of the group.

The **distance** between the members reflects **how similar** the answers to the specific team members taking into account the group responses.

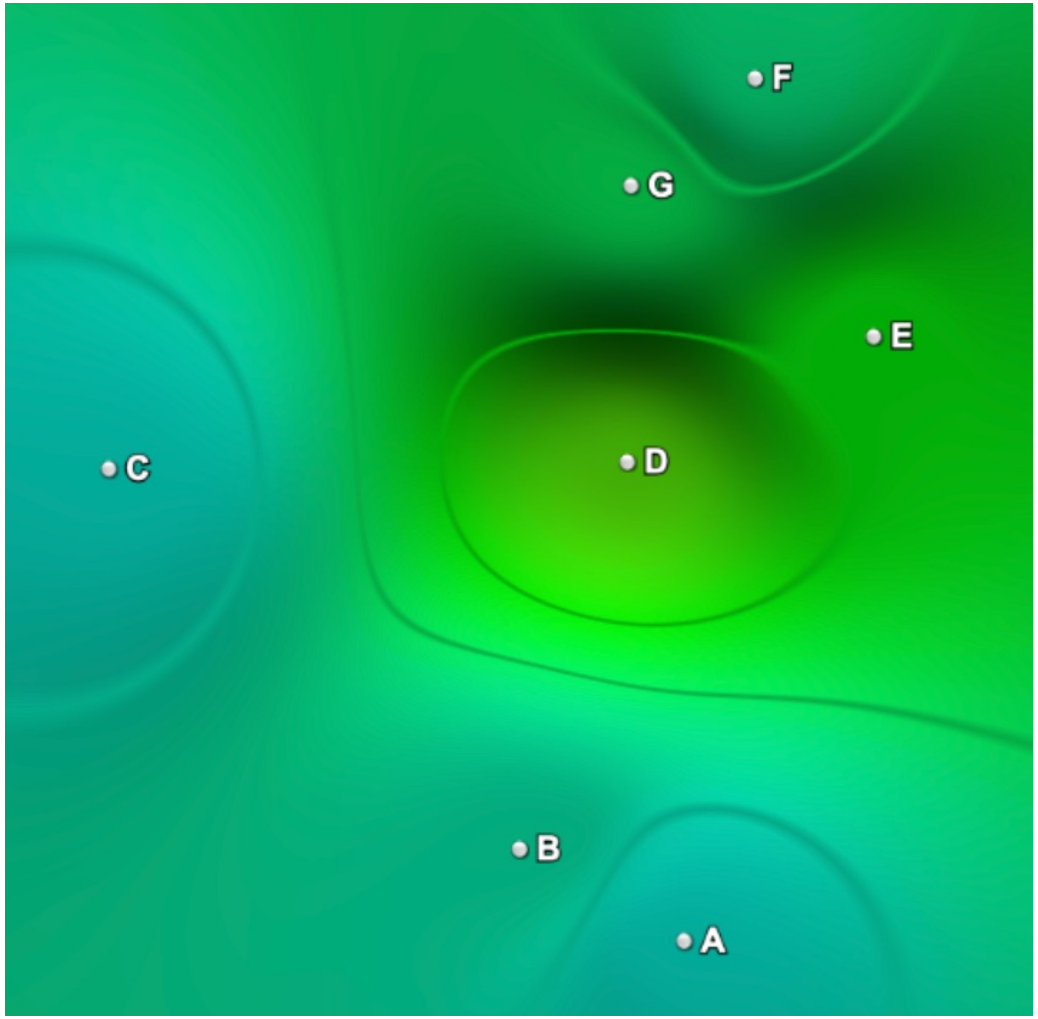


Questions asked to team members

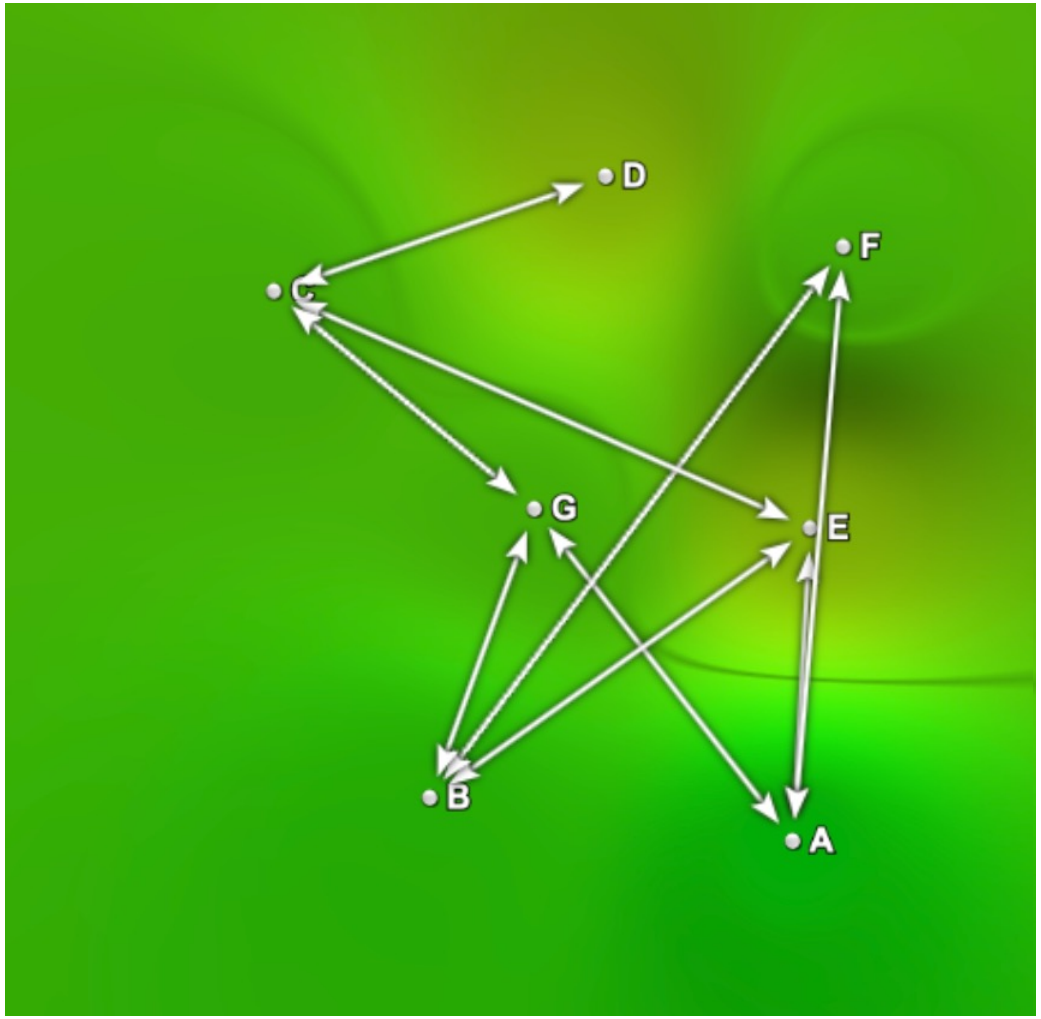
(Bahbouh, 2012)

	Rate each member of your team, depending on how often you communicate on work issues.		
Current communication	*How often do you communicate with your team members about work-related topics?*	1 = almost all the time	5 = almost never
Desired communication	*How often would you like to communicate with your team members in order to work most effectively?*	1 = almost all the time	5 = almost never
Importance of communication	*How important is communication with your team members for you to deliver high quality outputs?*	1 = not at all	5 = critically important
Quality of communication	*Evaluate the quality of work communication, taking into account its relevance, content, timeliness.*	1 = should often be better	5 = often above average

How it works

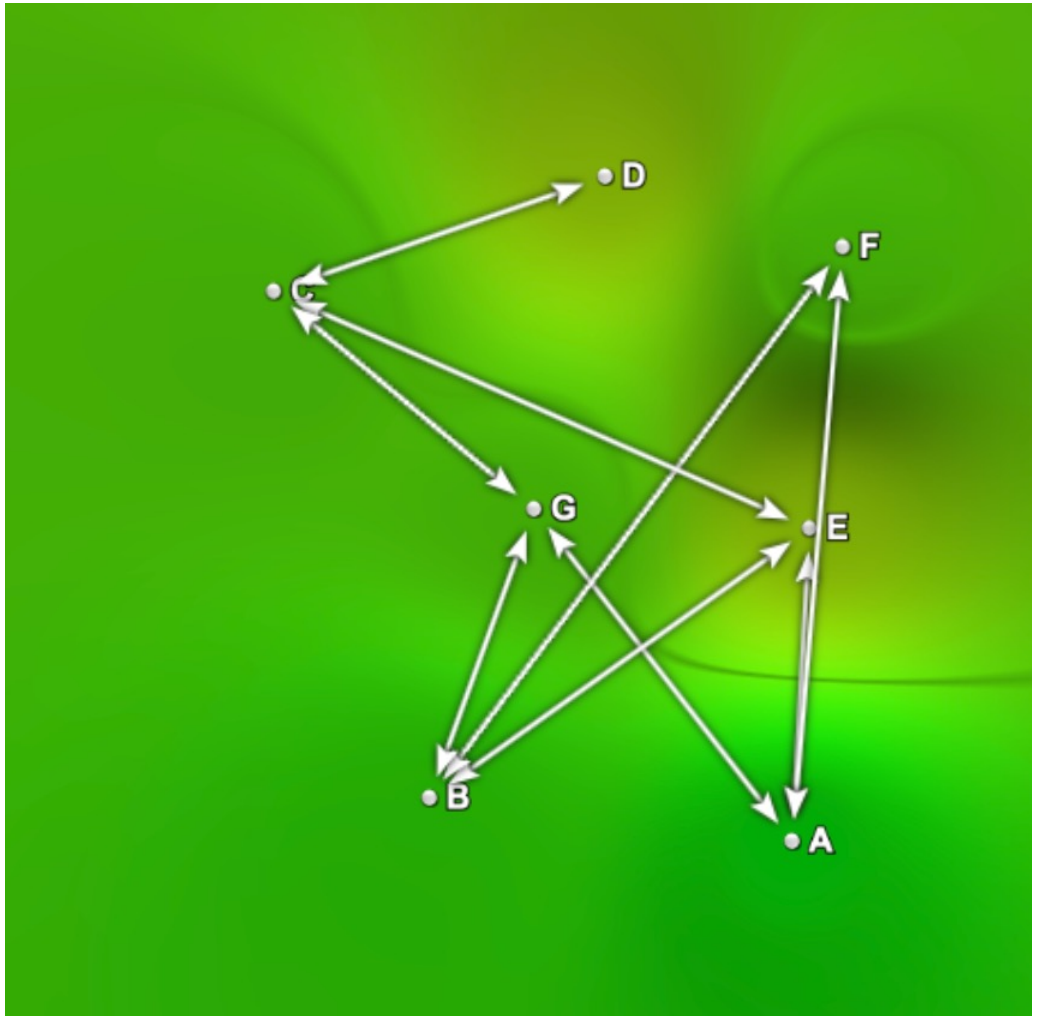


Current communication (1 session)

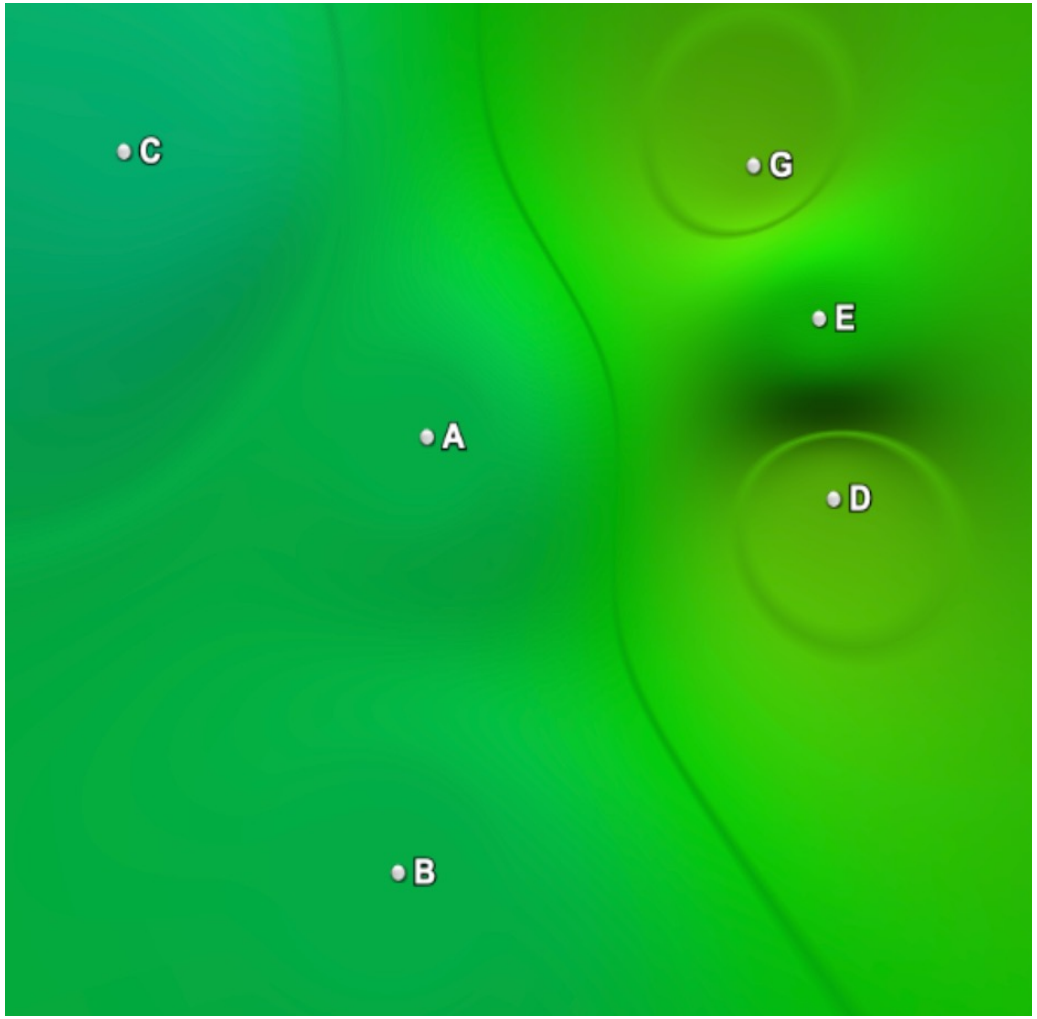


Desired communication (1 session)

How it works

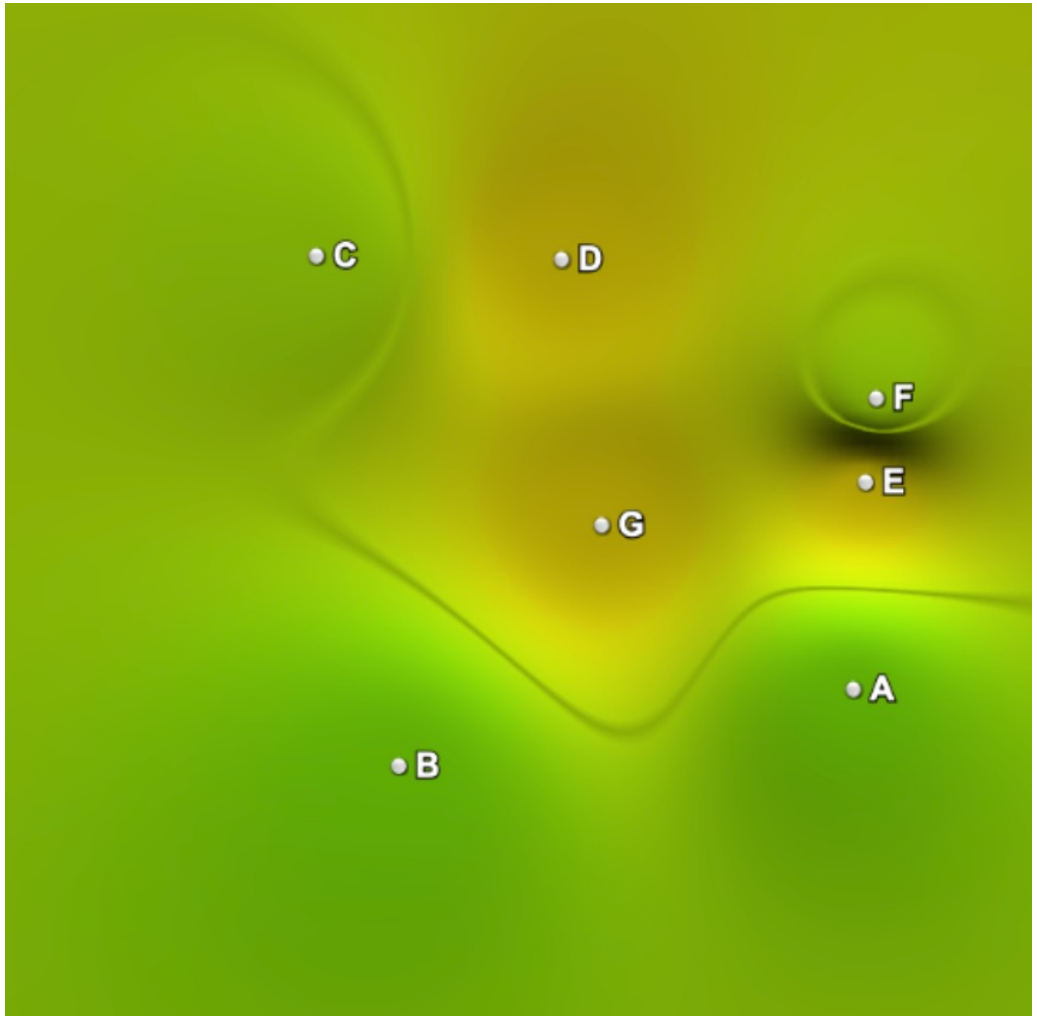


Desired communication (1 session)

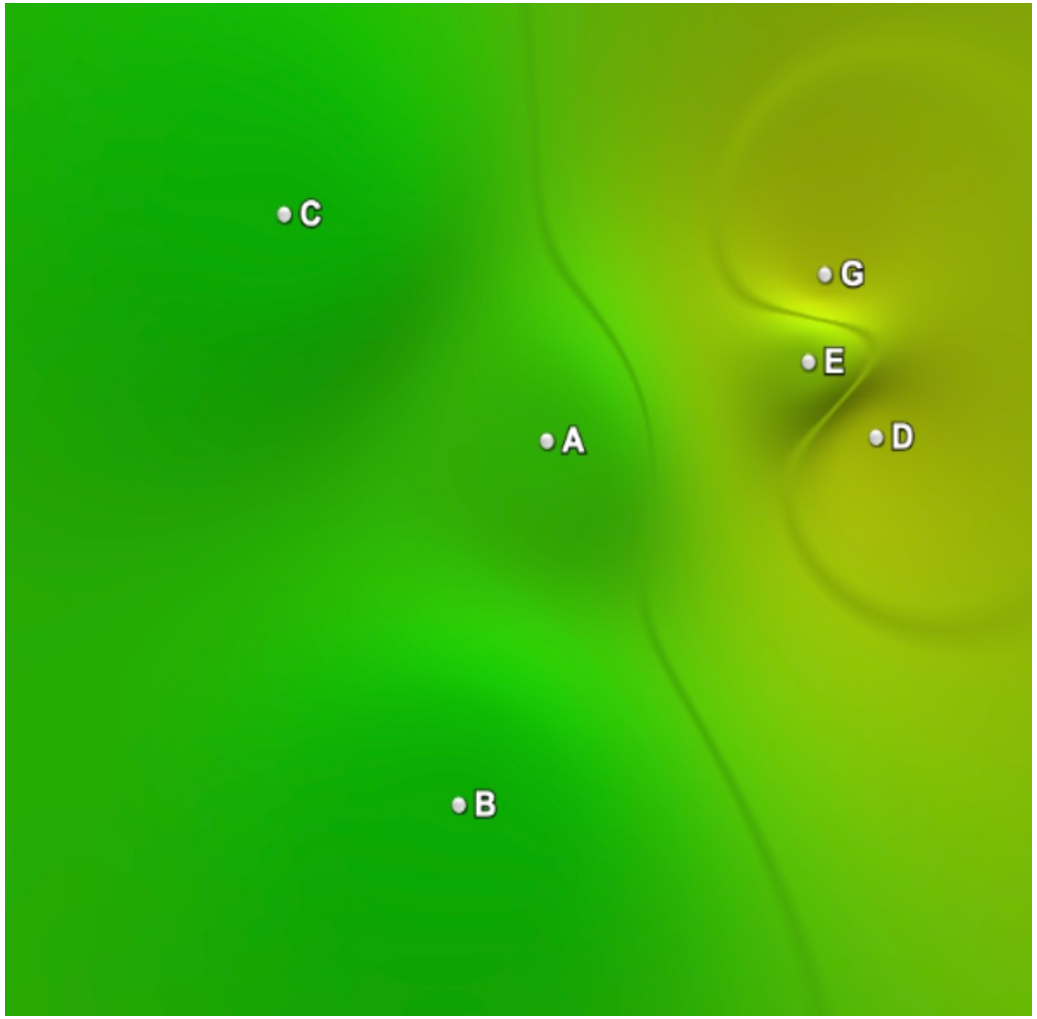


Desired communication (4 session)

How it works

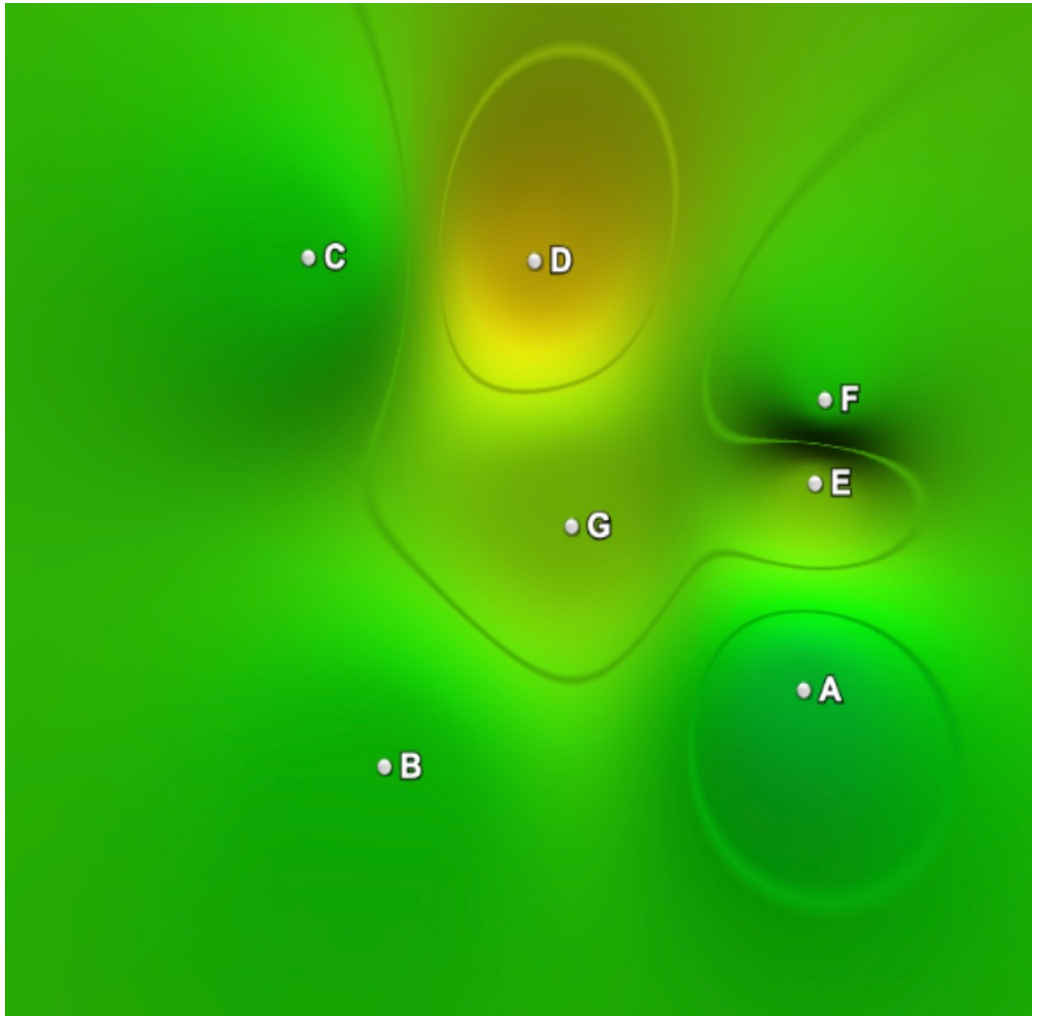


Importance of communication (1 session)

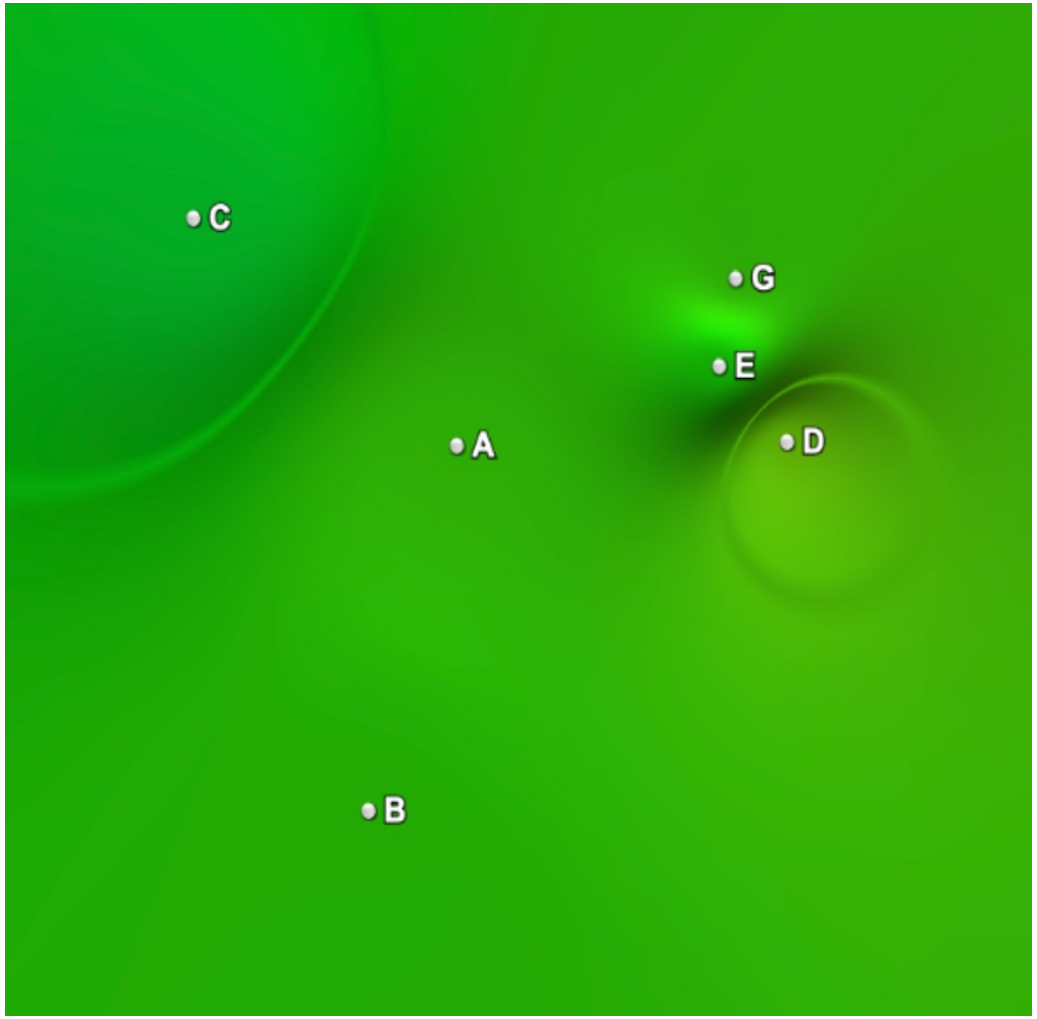


Importance of communication (4 session)

How it works



Quality of communication (1 session)



Quality of communication (4 session)

The intervention procedure

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1 session

- Current and desired communication

3 session

- Feedback and progress

APRIL 2021 — 2 ½ months — 2 ½ months — 2 ½ months — DECEMEBER 2021

2 session

- Quality and importance of communication

4 session

- Final debriefing

Structure of each session (via videoconferencing platform)

Live data collection → Real-time visualisation of sociomaps → Facilitated collective discussion → Creation/review of action plans

Participants

- **7 teams** from the 3 departments of a large Northern Italian public healthcare organisation:
  - Emergency
  - Medicine
  - Neuroscience
- 6-13 members per team (N = **62**)
- **Inclusion criterion**: same team or same healthcare process

74% women

2% managerial

M_{age} = 47

Data collection time points

Before intervention

- Pre – outcome measures

After intervention

- Post – outcome measures

After the 2nd session

- Process measures

After the 4th session

- Process measures

Process measures

Transferability

Yelon et al.. (2004)

1. *I believe what we learned on the training can help us at work*
2. *The skills we developed during the training will help us at work*
3. *We developed new skills for our work that we didn't have before*

1 = Strongly disagree, 5 = Strongly agree

Cronbach's α = .84 *(after 2nd session)*

Cronbach's α = .90 *(after 4th session)*

Acceptance

Martin et al. (2020).

1. *I feel the training met my expectations*
2. *I would recommend the training to others in a similar situation*
3. *The format of the training and the materials were appropriate for my team's needs*

1 = To a very low extent, 5 = To a very high extent

Cronbach's α = .88 *(after 2nd session)*

Cronbach's α = .78 *(after 4th session)*

Usability

Zhou et al. (2019)

System information arrangement

1. *Whenever I made a mistake, I could recover easily and quickly*
2. *The technology/platform provided an acceptable way to receive the intervention*
3. *This technology/platform has all the functions and capabilities I expect it to have*

Ease of use and satisfaction

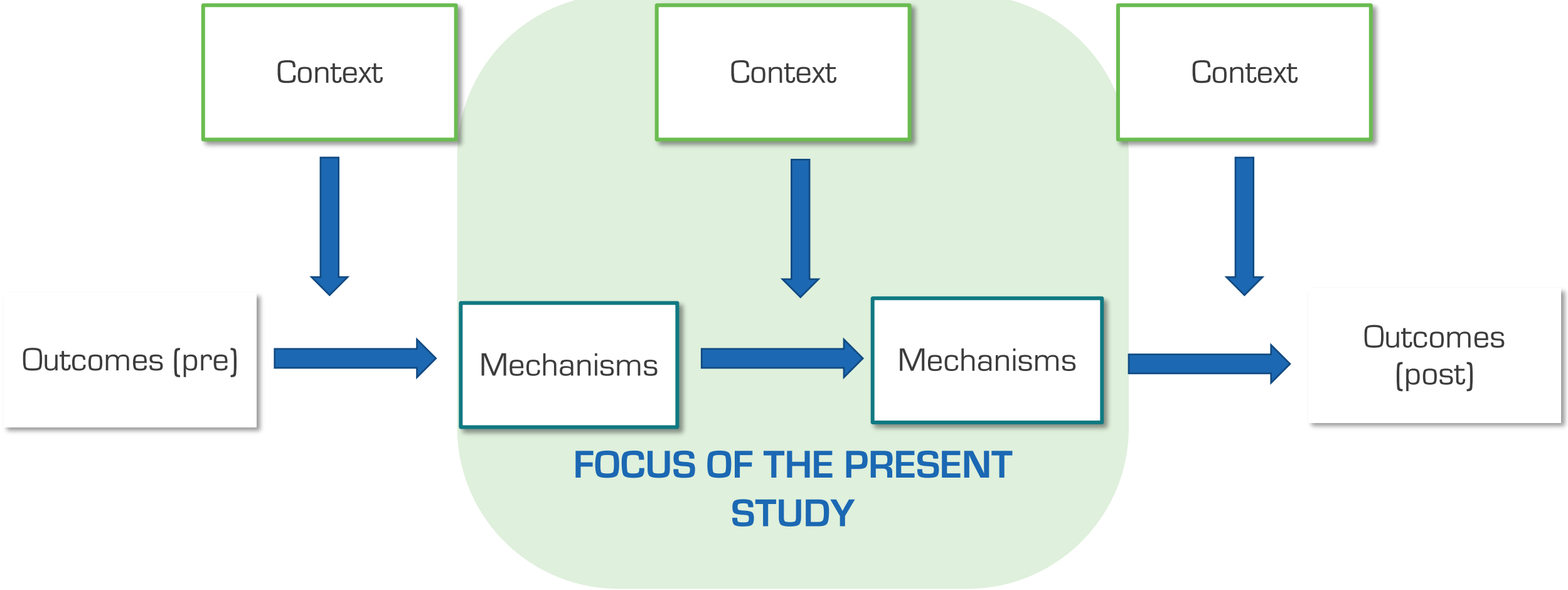
1. *The technology/platform was easy to use.*
2. *I would use this technology/platform again*
3. *Overall, I am satisfied with this technology/platform*

1 = Strongly disagree, 5 = Strongly agree

Cronbach's α = .90 *(after 2nd session)*

Cronbach's α = .74 *(after 4th session)*

Context-Mechanism-Outcome



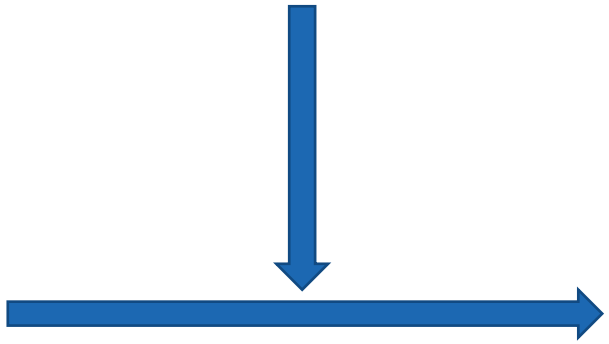
Hypothesised CMO configuration

System Usability

(The extent to which trainees feel comfortable using the digital tool)

Transferability of Intervention

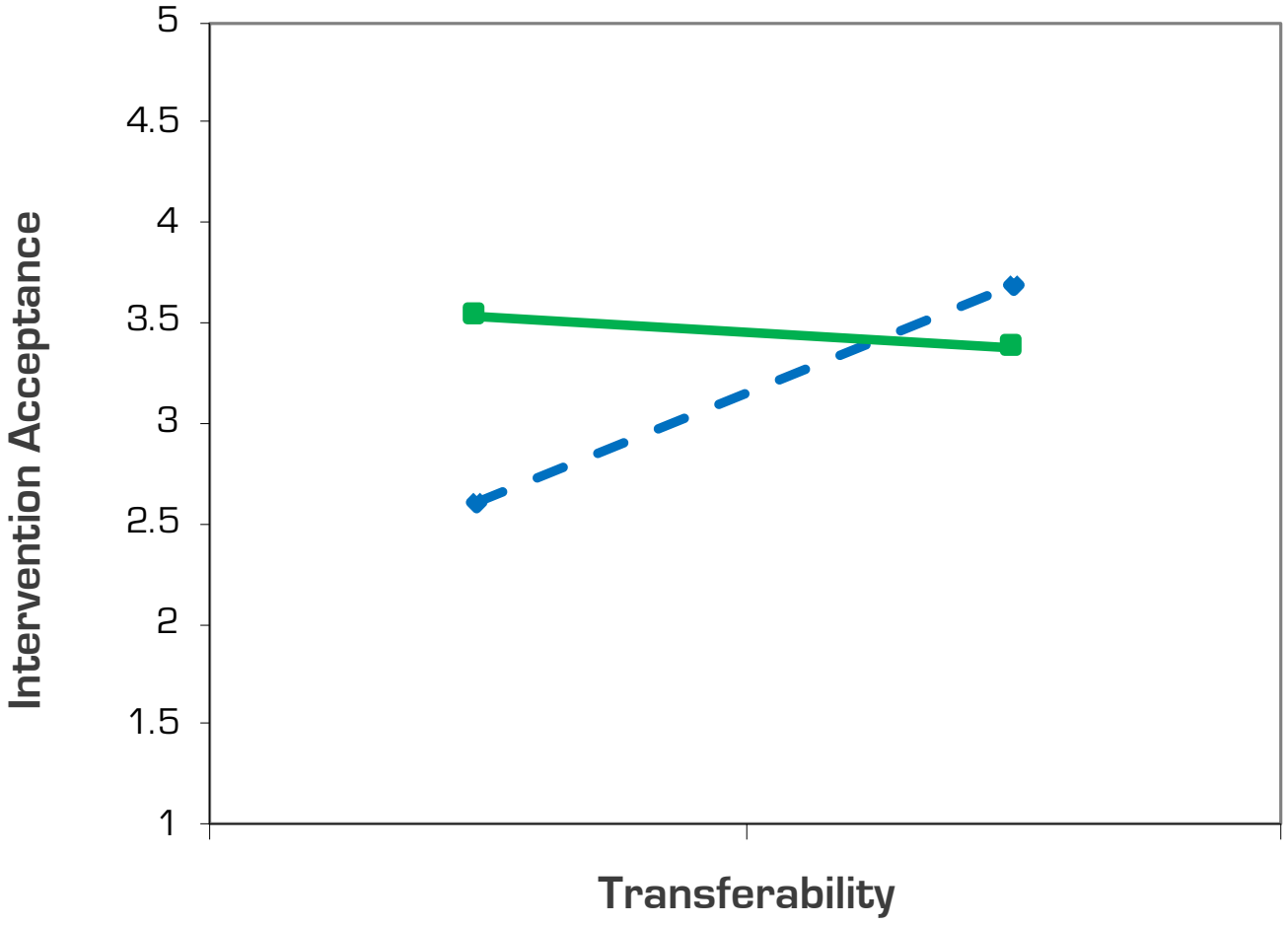
(The extent to which trainees feel the learnings of the intervention can be transferred into their daily work)



Acceptance of Intervention

(The extent to which trainees feel the training meets their expectations)

Results – after the 2nd session



Low system usability

High system usability

n = 32

R^2 = .48 *$F_{(4,27)} = 6.2162$* *p < 001*

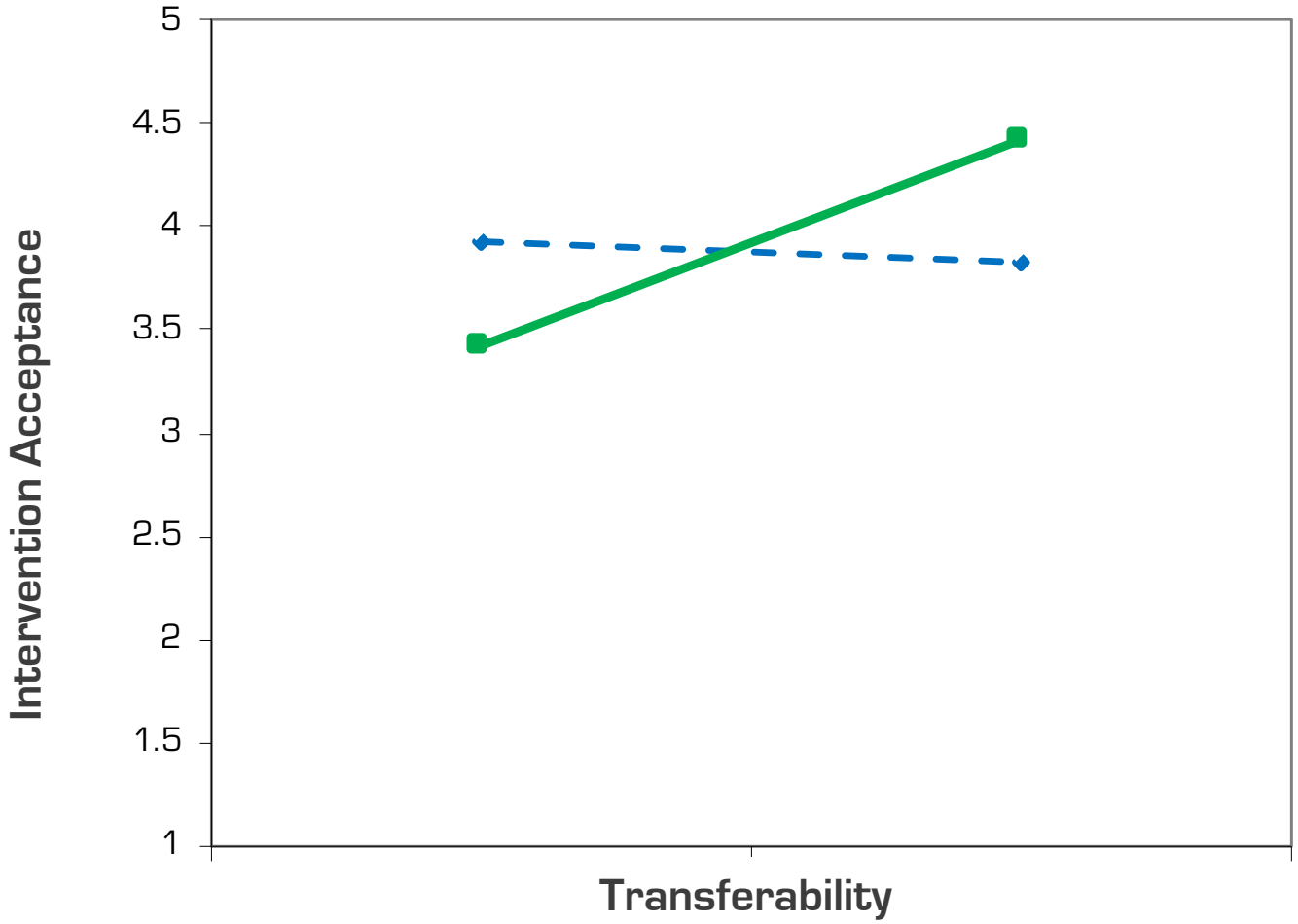
USAB → ACC *.15* *p = .14*

TRANSFER → ACC *.24* *p = .14*

*TRANSFER*USAB → ACC* *-1.05* *p < .05*

R^2-change = .11 $F_{(1,27)} = 6.023$ *p < .05*

Results – after the 4th session



Low system usability

High system usability

n = 19

R^2 = .50 *$F_{(3,15)} = 6.2162$* *p < 01*

USAB → ACC .26 p = .85

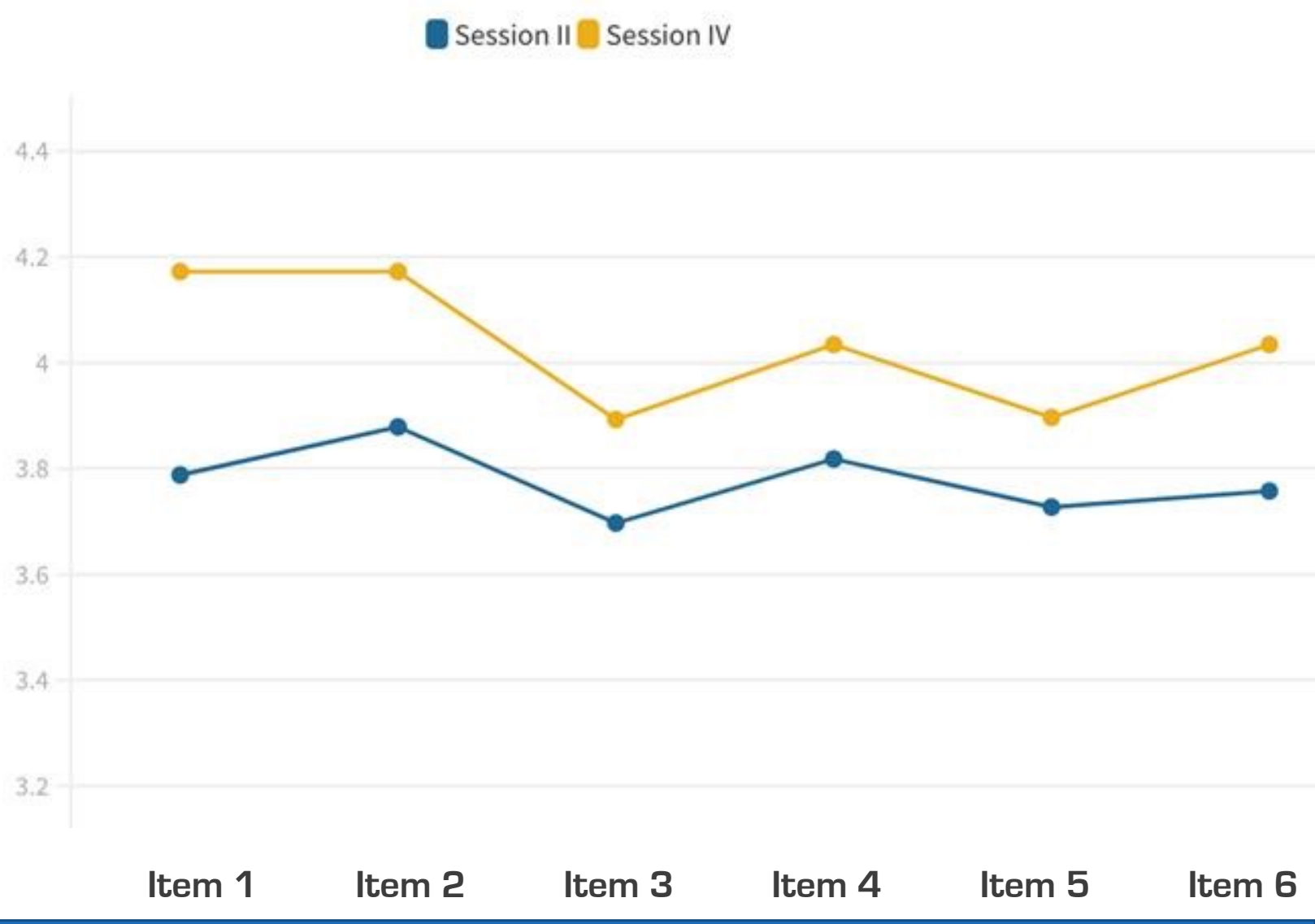
TRANSFER → ACC .32 p = .23

*TRANSFER*USAB → ACC .47 p < .05*

R^2-change = .16 $F_{(1,15)} = 4.612$ *p < .05*

Measures over time – Usability

1. Whenever I made a mistake, I could recover easily and quickly
2. The technology/platform provided an acceptable way to receive the intervention
3. This technology/platform has all the functions and capabilities I expect it to have.
4. The technology/platform was easy to use.
5. I would use this technology/platform again.
6. Overall, I am satisfied with this technology/platform.



Discussion and conclusions

- After second session, negative effect of transferability x usability interaction on acceptance
- After fourth session, positive effect of transferability x usability interaction on acceptance
- Usability increased throughout sessions

➢ The greater the usability over time, the greater the possibility of accepting the intervention and understanding how to transfer the learnings into work thus improving team communication

➢ Time to become familiar with the tool may be needed – calibration process or learning curve (to understand the intervention in its main components, how to read the maps and how to develop improvement actions consistent with the workplace)

Limitations and future research

- Small sample size
- Team members changed over time (**turnover** or **rotation**)
- Analysis at the individual level

➢ Team-level/multilevel analysis is foreseen with 24 teams (n = 320) from two Italian and two Czech organisations

Special thanks to...

Marco De Angelis

Cristian Vasquez

Rudolf Kubík

Karina Nielsen

Radvan Bahbouh

Luca Pietrantoni

H-WORK project

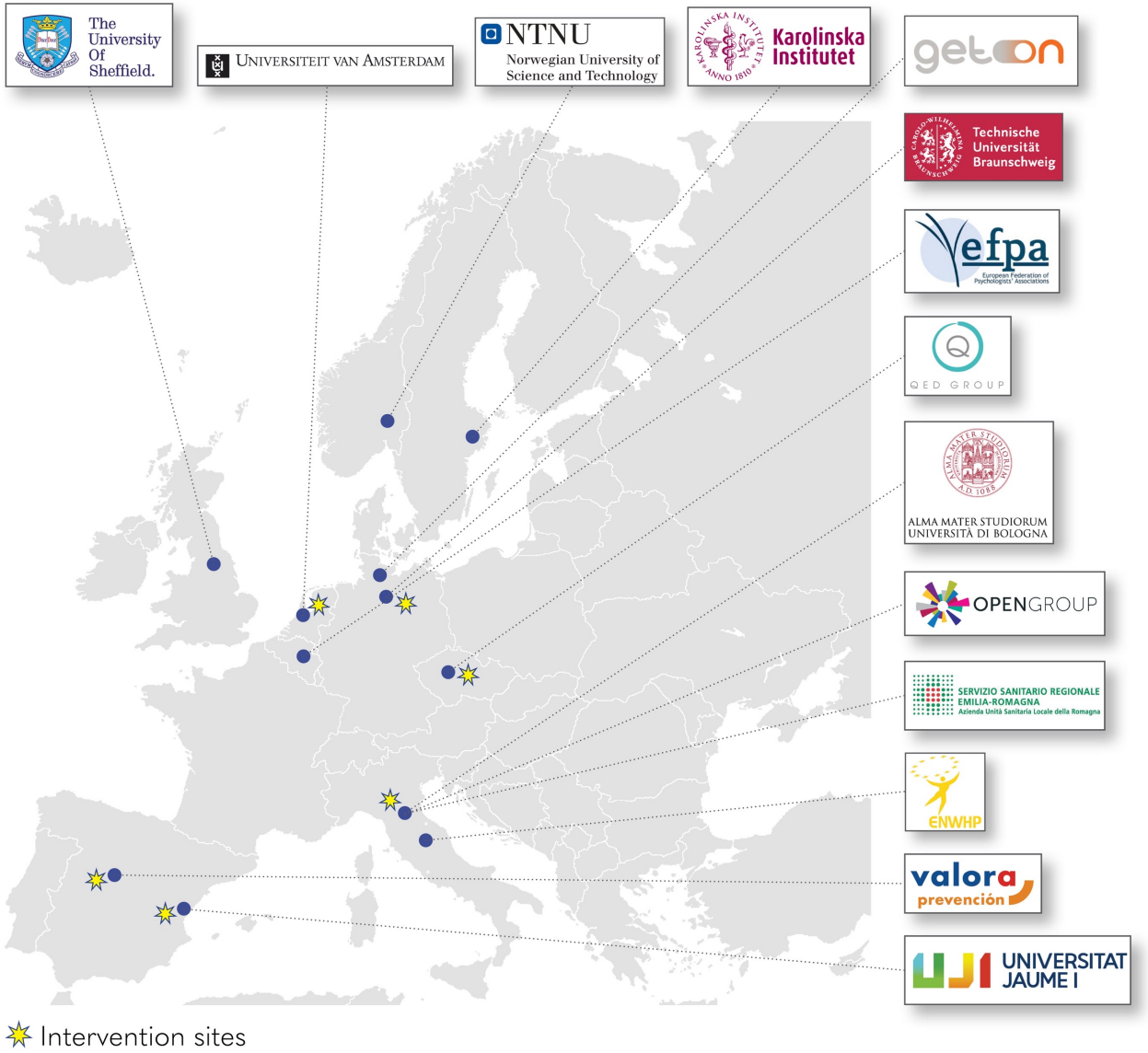
14 partners

9 European countries

10 Intervention sites

Different partner types:

- 7 Universities
- 2 SMEs
- 2 European Associations/Networks
- 1 Public Health Service
- 1 Private company
- 1 No-profit organisation



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