



REFLECTION REPORT – first run Spark training Sept-Oct ‘22

1. Introduction

The Centre for Unusual Collaborations (CUCo) has been providing grants for unusual collaborations across scientific disciplines since 2020. After one year of funding, the Centre identified a need for strengthening the competences of researchers to make these collaborations more effective. To meet this need, the CUCo Spark grant was re-envisioned in 2022 as a two-phased co-learning journey. The first step in the learning journey – Spark phase 1 – comprises four half-day workshops that serve the dual purpose of interdisciplinary research competence development and of connecting researchers with one another as potential Spark collaborators. After completing the four half-day workshops, participants can enter Spark phase 2, in which pairs of Spark phase 1 participants from different disciplines assemble a team and identify and develop a project topic for their project.

The aim of this report is to provide an analysis of the first run of the SPARK Phase 1 training that ran in September and October 2022: from its design to its evaluation. The analysis is inspired by principles of Educational Design Research. Educational Design Research makes explicit the assumptions, theories and decisions that guide the process of designing educational interventions and is often structured in five stages: 1) needs and context analysis, 2) prototype development and testing, 3) formative evaluation, 4) refinement of the prototype and testing, 5) formative evaluation of the second prototype (Plomp & Nieveen 2010¹). The report follows these five stages and starts with a brief outline of the assumptions and theories that guided the design.

2. Assumption & Theories

The following key assumptions informed the development and the design of the training:

- Interdisciplinary research collaborations ask for specific competences that researchers are not necessarily trained in already
- These competences can be (partly) acquired through training
- Embodied and experiential learning approaches are specifically useful for training interdisciplinary competences

Theoretically, the training design is informed by three frameworks: i. Interdisciplinary competences and ii. Theory U and iii. Arts-based and embodied approaches to learning

1. *Interdisciplinary competences*

¹ [Introduction_20to_20education_20design_20research.pdf \(utwente.nl\)](https://www.utwente.nl/~education/2020/education_20design_20research.pdf)

The [framework for interdisciplinary competences developed by Utrecht University](#). The framework is grounded in the work of Repko and Szostak (2020)² and distinguishes three learning goals and four general academic skills that are considered crucial for interdisciplinary collaborations.

The three learning goals are:

- Disciplinary grounding
- Perspective taking
- Common ground & Integration

The four skills are:

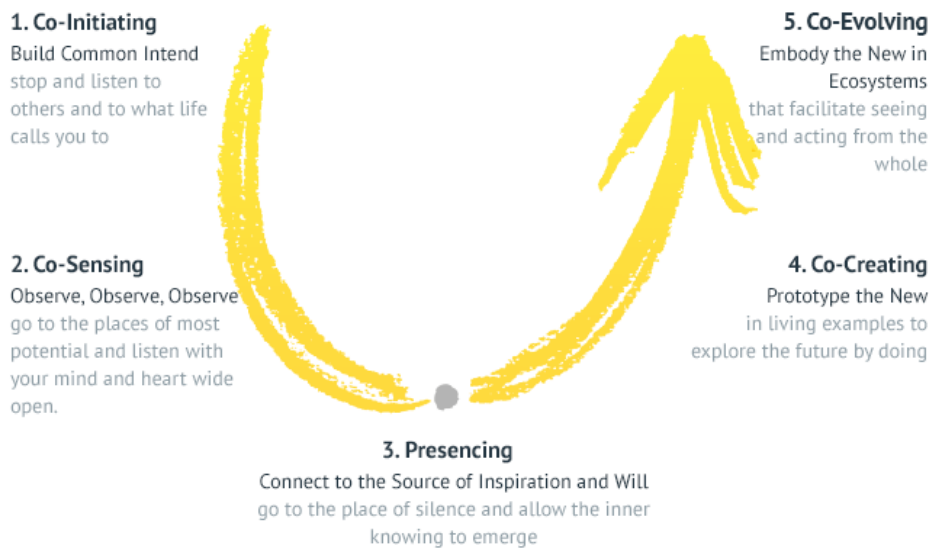
- Critical Reflection
- Collaboration
- Communication
- Adaptability and creativity.

While the framework is developed specifically for students of interdisciplinary studies (as a research field in itself), the framework is also relevant for researchers that are embedded within a discipline to work across disciplinary boundaries.

2. *Theory U*

In addition, the training design was inspired by Theory U. Theory U has been developed by Otto Scharmer at the Presencing Institute of MIT and is a framework for guiding personal, collective and systemic change. Key to Theory U, is the importance given to inner dimensions, such as values and emotions that guides people's practice.

² Allen F. Repko, Rick Szostak (2020) *Interdisciplinary Research: Process and Theory*, SAGE Publications



As interdisciplinary collaborations require researchers to step out of their comfort zone and adopt new types of practices, Theory U provides an apt framework for supporting people through this discomfort and embracing the feelings and emotions that can emerge when venturing into new territories. Moreover, Theory U is apt for guiding complex processes that are relatively open-ended. This distinguishes Theory U from more traditional forms of project management, where first a goal is defined and then steps are defined to get there. Interdisciplinary collaborations lend themselves less to these types of approaches, as interesting directions and results rather emerge in the process than being defined in advance.

3. Arts-based and embodied approaches to learning

Finally, the training was informed by arts-based and embodied approaches to learning. Arts-based and embodied approaches are proven to support creative thinking, perspective taking and communication.

3. Needs & Context Analysis

Interviews with representatives of each of the three target user groups (pre-Spark, Spark and Unusual Collaborations grant receivers) as well as with experts on interdisciplinary research served as the first phase of data collection for the development of the training. The purpose of the interviews was to develop an understanding of what they know, do and need relative to being able to fruitfully develop and engage in unusual interdisciplinary research collaborations.

A Sounding Board was composed of experts and Spark and UCo fellows that gathered two times during the design process to provide input on the development of the training, as well as the process of guidance, post-training.

The interviewees identified a number of challenges in leading and participating in a team project. These challenges include understanding one another's disciplinary and personal lenses, having limited project leadership and management training, reaching shared definitions and perspectives, distinct expectations from the project, the difficulty of qualitative analysis, lack of in-person team bonding, the difficulty of bridging disciplinary gaps, the limited budget, and the limited availability of time due to work pressure and funding cycles of one year. To overcome these challenges, methods were employed such as brainstorming, icebreaking, assigning clear tasks, and involving research assistants.

4. Design (Self-assessment tool + training)

Theoretical as well as practical insights led to the design of two 'products'

1. A self-assessment tool for interdisciplinary competences, aimed at supporting researchers to gain awareness of interdisciplinary competences needed, as well as support reflection on their own competences
2. A training programme of four workshops of four hours, aimed at interdisciplinary research competence development and of connecting researchers with one another as potential Spark collaborators

Self-assessment tool

The [self-assessment tool](#) consists of a set of open questions, aimed at supporting self-reflection and self-awareness of interdisciplinary competences. The self-assessment tool requires between one-and-a-half and three hours to complete.

Training programme

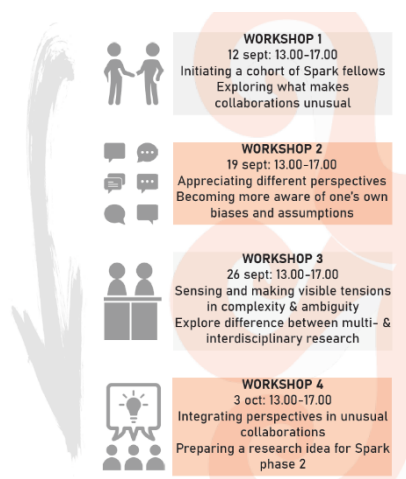
Design process

After identifying learning outcomes for each of the four workshops, the training programme was designed by the core team (Meghann Ormond, Anke de Vrieze, Corinne Lamain) in several sessions. The final programme was composed during a two-day retreat. All three team members have experience in designing and giving training. Two of the team members have experience in developing educational programmes in higher education.

The structure of four half-day workshops was chosen for practical reasons: it seemed feasible to ask people for four half-days and a session of four hours would allow for exploring the different competences in some depth.

Setup workshops

Each of the four workshops of the training programme addresses a key competence for interdisciplinary research as described in section 2; i. disciplinary grounding, ii. perspective taking, iii. finding common ground & integration, and iv. collaboration. In addition, competences such as creativity, adaptability and communication came back in most workshops. Furthermore, the workshops were aligned with the Theory U phases: convening, observing, reflecting, acting



5. Formative evaluation

While a format for monitoring and evaluation was not developed in advance, both the self-assessment tool and training were evaluated in several ways.

The self-assessment tool:

- In a session of the Transformative Learning Hub at Wageningen University, participants worked with the tool and shared their feedback
- Iris van der Tuin, UU Dean of Interdisciplinary Education provided minor feedback on wording and was generally very positive. Iris van der Tuin asked a cohort of the 'UU leergang Interdisciplinair Onderwijs - an educational track for teachers in interdisciplinary education, who were positive about its use. A key concern remains the duration of completion, which is substantial (i.e. more than two hours).
- Spark training participants were asked for feedback on the tool in a survey

Evaluation of the training was done:

- Via meta-reflection in each training session. On a flip chart with the day's programme, participants were asked to write on post-its: what did it do for me, what did it not do for? In this way, immediate feedback was gathered on how the design worked

- After each session, the team of trainers held a debrief , guided by questions: where's the energy, where's the concern, what felt pre-scripted or needs to be tweaked. These debriefs were recorded and transcribed.
- At the end of the training, feedback from participants on the entire training was gathered through a survey. 'Measurement' of competences was not explicitly included.

In the following, the self-assessment tool and training design are evaluated ex-post in light of the criteria for formative evaluation as proposed by Plomp & Nieveen (2010)³:

Criterion	
Relevance (also referred to as content validity)	There is a need for the intervention and its design is based on state-of-the-art (scientific) knowledge.
Consistency (also referred to as construct validity)	The intervention is 'logically' designed.
Practicality	Expected The intervention is expected to be usable in the settings for which it has been designed and developed.
	Actual The intervention is usable in the settings for which it has been designed and developed.
Effectiveness	Expected Using the intervention is expected to result in desired outcomes.
	Actual Using the intervention results in desired outcomes.

Table 1: Criteria for high quality interventions

Relevance

There is a need for the intervention and its design is based on state of the art (scientific) knowledge

Training

The need for this training emerges from the needs- and context analysis, as well as from CUCo's prior experiences. The analysis indicated that people lack the experience and skills or competences needed to successfully work across disciplines.

As described above, the training is grounded in the framework for interdisciplinary competences as developed by the Utrecht University, which in turn is rooted in work by Repko and Szostak (2020)⁴. The body of knowledge on inter- and transdisciplinary research and learning is still emerging, and for future editions, it's important to keep up with the literature available. In addition, CUCo wishes to contribute to this body of knowledge through more thorough evaluation of its training programmes

³ [Introduction_20to_20education_20design_20research.pdf \(utwente.nl\)](#)

⁴ Allen F. Repko, Rick Szostak (2020) *Interdisciplinary Research: Process and Theory*, SAGE Publications

as well as through research on interdisciplinary learning processes within and between projects that are supported through the CUCo granting scheme.

Consistency

The intervention is 'logically' designed

The training objectives were identified as follows:

1. develop a cohort
2. support the development of interdisciplinary competences

The first objective - develop a cohort - was supported through following the phase of Theory U and community activities, such as:

- an informal lunch prior to the training sessions
- check-ins and check-outs in every training session
- peer learning activities in all training sessions

The second objective – development of interdisciplinary competences - was supported through the framework for interdisciplinary competences.

Practicality

The intervention is usable in the settings for which it has been designed and developed

Self -assessment tool

Key feedback on the self-assessment tool is that it's too time-consuming to fill in. This limits the practicality of the tool.

Training

Given that the target group for this training are mid-career researchers with full agenda, the training design was aimed at limiting the time commitment required while allowing for enough depth in each session. This resulted in the design of four afternoon workshops of each four hours.

In practice, participating in the four half-day workshop proved feasible for this target group. One participant gave feedback that meeting every week was intense and suggested doing it on a bi-weekly basis - allowing participants more time to process and reflect on the exercises. Though, the training did allow people to go through a flow and having bi- weekly sessions might disrupt this flow.

The set-up of weekly meetings won't be changed in the next iteration, as dates were already planned. For the third iteration (September 2023), a week of rest will be scheduled between sessions 2 and 3.

Effectiveness

Using the intervention results in the desired outcomes

Self-assessment Tool

The self-assessment tool aims at supporting researchers to gain awareness of interdisciplinary competences needed, as well as support reflection on their own competences

Feedback on the self-assessment tool indicates that the tool is effective in raising awareness, but its lack of practicality limits its effectiveness. Developing a more user-friendly format and embedding it in the training, will improve its effectiveness. Moreover, the self-assessment tool was not brought into the training, nor after the training, and this also limits the effectiveness of the tool. Thus, in the next iteration, a simpler version of the tool is needed, and the tool should be embedded in the training design. To get insights into the development of competences, participants should be asked to fill in the self-assessment tool prior to as well as after the training - and share this with the training. A more visual outcome, e.g. a spider web figure showing scores on the different competences, would be helpful.

Training

The training aims at interdisciplinary research competence development and of connecting researchers with one another as potential Spark collaborators.

The training led to the formation of two teams that (successfully) entered Spark Phase 2. It can thus be concluded that training was effective in forming a cohort.

Still, given the limited time during trainings days, the forming of a cohort can be strengthened by:

- having an online check-in meeting prior to the start of the training in which participants are introduced to the course and each other.
- The training team noticed that on the first training day, participants were timid and needed more time to break the ice. An online check-in meeting can support the breaking of the ice. In addition, the check-in activity - aimed at getting to know each other as researchers and human beings - worked less well and can be replaced by another activity that's more intuitive and lower threshold
- The forming of a cohort can also be strengthened by providing a better overview of participants' expertise prior to and during the course.

Whether four half-day workshops are enough to fully train intended competences, is questionable. However, feedback indicates that participants gained a better understanding of interdisciplinary collaborations and what competences are required to make them effective. To better train these competences, more or longer training days would be beneficial, but that would limit the practicality of the training. At the moment, no proper follow-up of the training has been developed during Spark Phase 2. This is mostly due to lack of time to develop a format.

Measuring the effectiveness of the training is limited by the fact that competences were not 'measured' in advance. In a next iteration, it would be important to get a clearer picture of the level of competences that participants start the training with. The question is, how to do that in a way that doesn't feel like an assessment – which is not how the training is intended.

A final reflection is that while the training addresses disciplinary grounding, perspective taking and finding common ground, the attention for integration is limited. It would be valuable to explore how this can be strengthened, for example in the fourth training session.

6. Training redesign

Key conclusions from the evaluation of the first edition of the training:

- the practicality and effectiveness of the **self-assessment tool** can be strengthened by:
 - developing a more user-friendly and less time consuming version
 - including a visual, e.g. a spider web figure, to support people's self-assessment of interdisciplinary competences (prior to and after the training)
 - embedding the use of the tool in the training programme
- the effectiveness of the **training** can be strengthened by:
 - Providing training participants with an overview of each other's expertise prior to, and during, the training
 - spending more time on breaking the ice and getting to know each other in the first session
 - paying more attention to the competence of integration in the fourth session
 - better 'measuring' the effectiveness of the training through self-assessment of competences prior to , and after, the training