Hochschule für Technik
und Wirtschaft Berlin

University of Applied Sciences

Hybrid learning spaces. Findings on similarities and differences from two labs in Sweden & Germany

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University:Future Festival 2025

LEARNING SPACE LABS

for hybrid and student-centred teaching and learning scenarios

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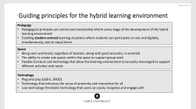

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Project Website:

Project Video:

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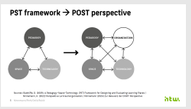

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Publications & more information:

Project Videos:


UMEÅ UNIVERSITET

Learning Lab Hybrid Umeå

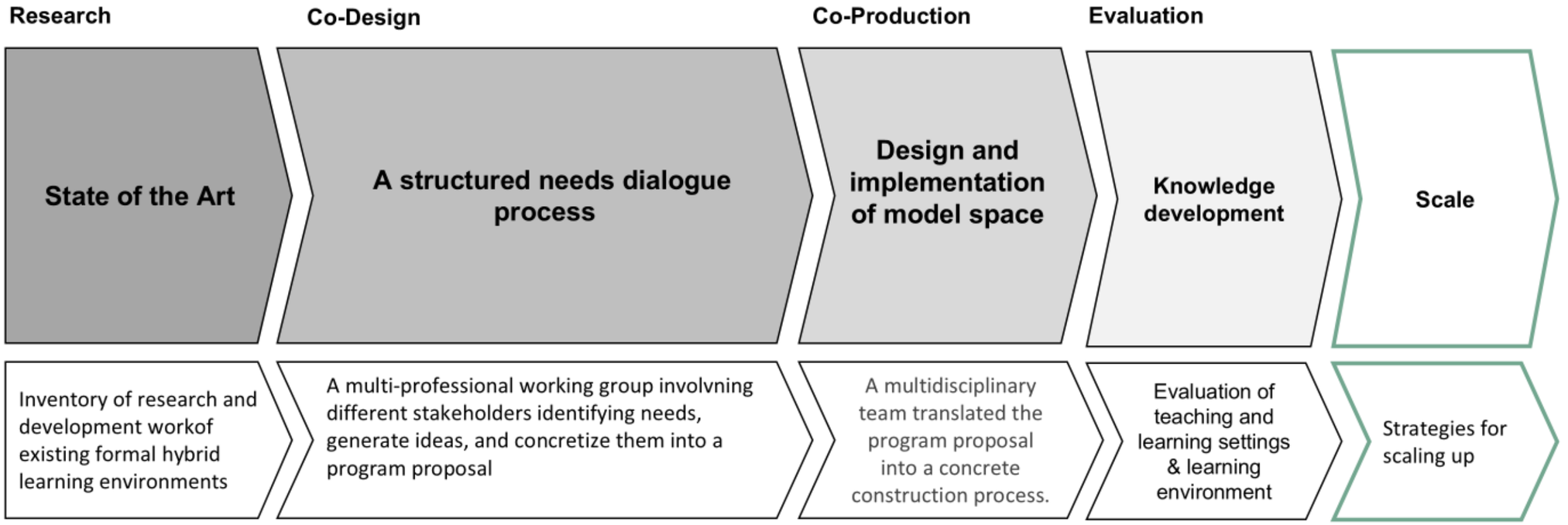
Desiged for syncronous hybrid interaction and student active learning

Collabration between Umeå university and Akademiska Hus (Facility owner)

- A **testbed with allocated annual fundings** for change and development throughout the project (2021 – 2025)
- **Assigned technical and pedagogical support**
- Close collaboration with teachers and students

Investigate how **space**, **technology**, **pedagogy** and **social interaction** can be designed for hybrid learning situations where students can participate on-site and digitally, **simultaneously, and on equal terms**

Co-Design: Research and participatory process



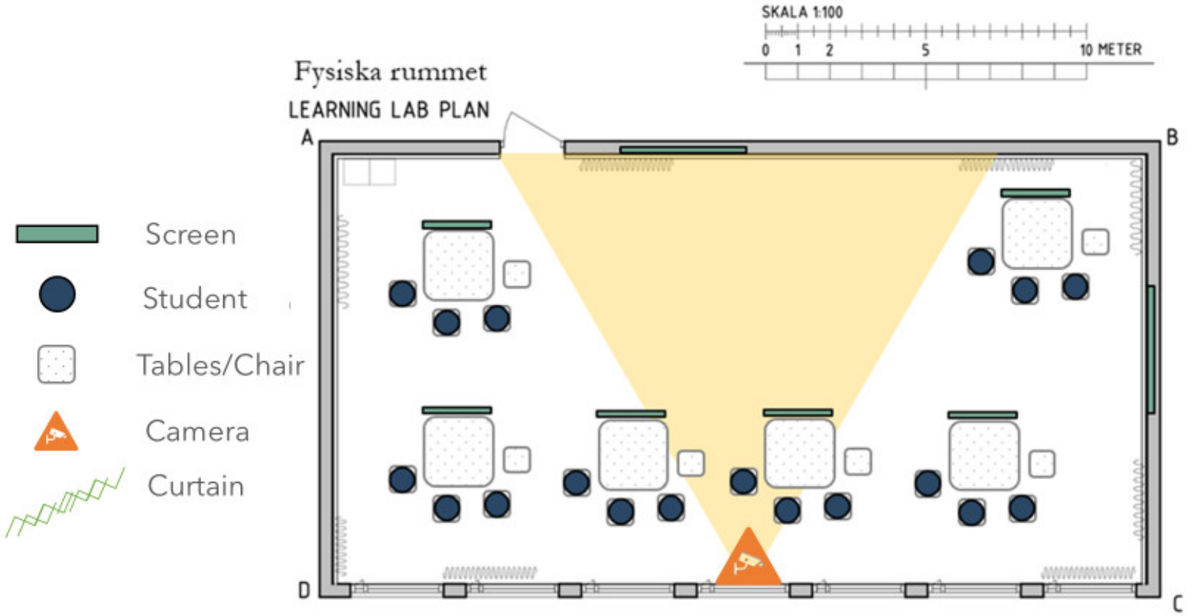
Guiding principles for the hybrid learning environment

Pedagogy
- Pedagogical principles are central and consistently inform every stage of the development of the hybrid learning environment
- Enabling **student-centred** learning situations where students can participate on-site and digitally, simultaneously, and on equal terms

Space
- Being seen and heard, regardless of location, along with good acoustics, is essential
- The ability to create sub-spaces within the space to support group work
- Flexible furniture and technology that allow the learning environment to be easily rearranged to support different activities and needs

Technology
- Plug-and play (USB-C, BYOD)
- Technology that enhances the sense of proximity and connection for all
- Low technology threshold: technology that users can easily recognize and engage with

Learning lab, iteration 1, ht22



CO-EVALUATION: USER EXPERIENCE

- Teacher-and student survey
- Foto-and film documentation
- Observations
  - Follow-up discussions with teachers
- Interviews

User experience perspective
Identified challenges

Acoustics

Problematic in simultaneous group activities

Furniture

Large, square tables

- Suitable for analogue group activities.
- Problematic for focus/direction of attention between on-site and on-line participants

Technology

Representation of on-site and on-line participants

BYOD: The variation in devices brought by users cause incompatibility, creating barriers to effective collaboration and communication

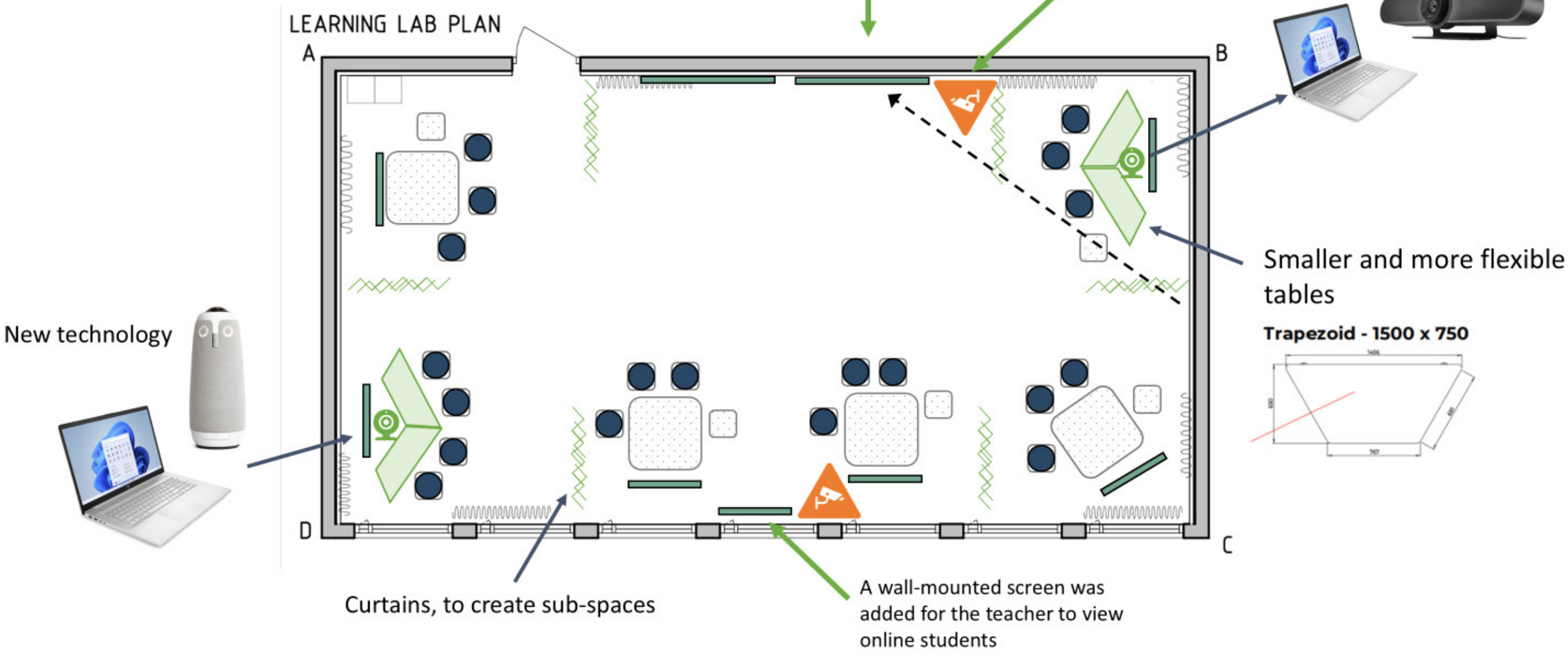
Learning lab, iteration 2, vt23

New main computer

A wall-mounted screen was moved

A second camera was added to allow a view into the room

New technology



Smaller and more flexible tables

Trapezoid - 1500 x 750

New technology

Curtains, to create sub-spaces

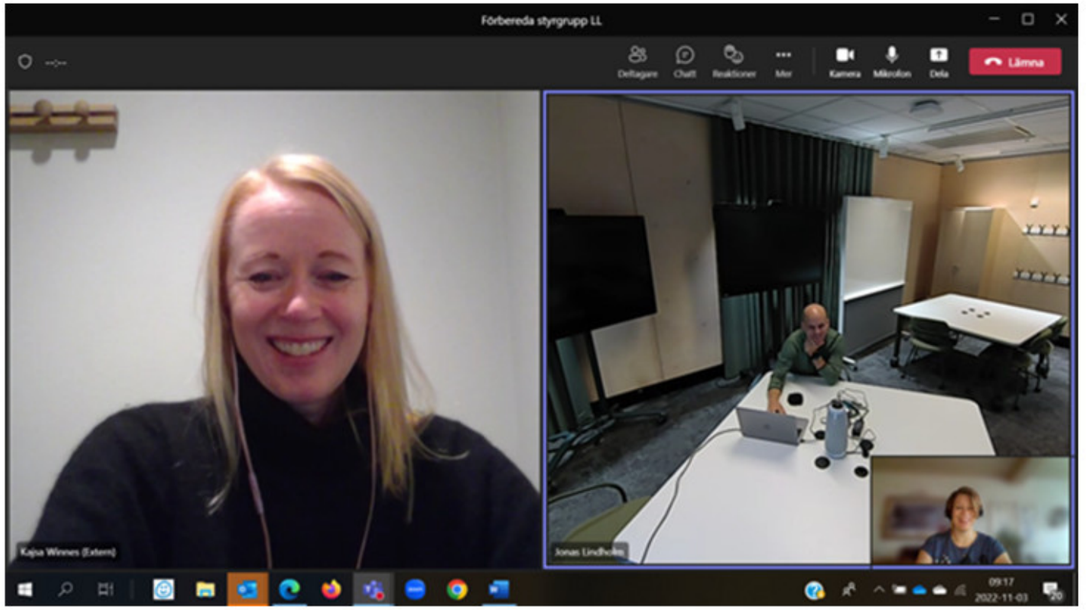
A wall-mounted screen was added for the teacher to view online students


Representation of online students
Students view
Representation of online students
Teachers view

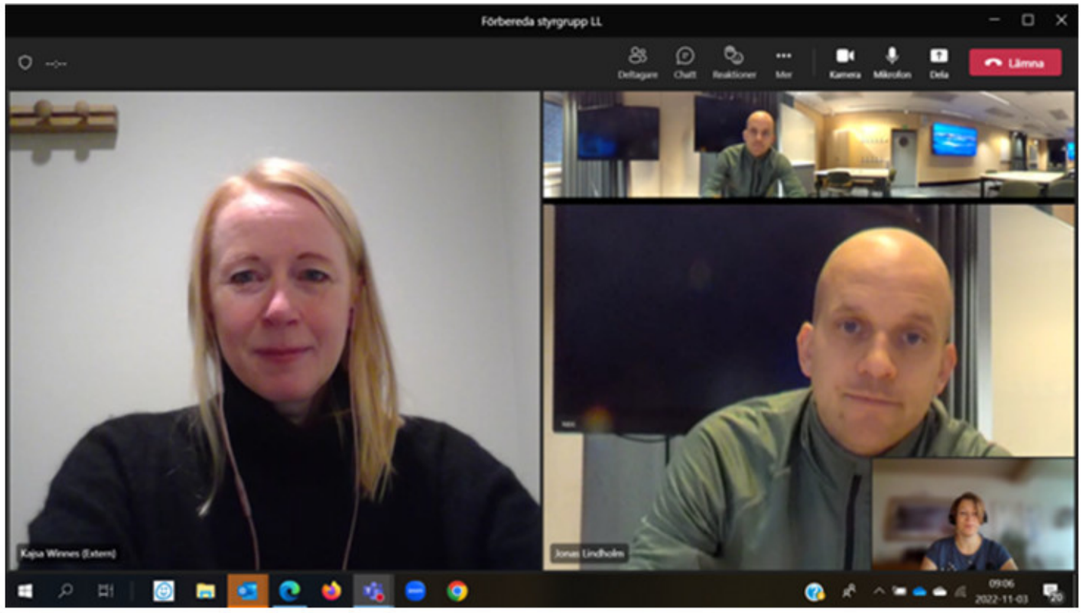
User-centred design with tables and technology that enhances the sense of proximity and connection for all

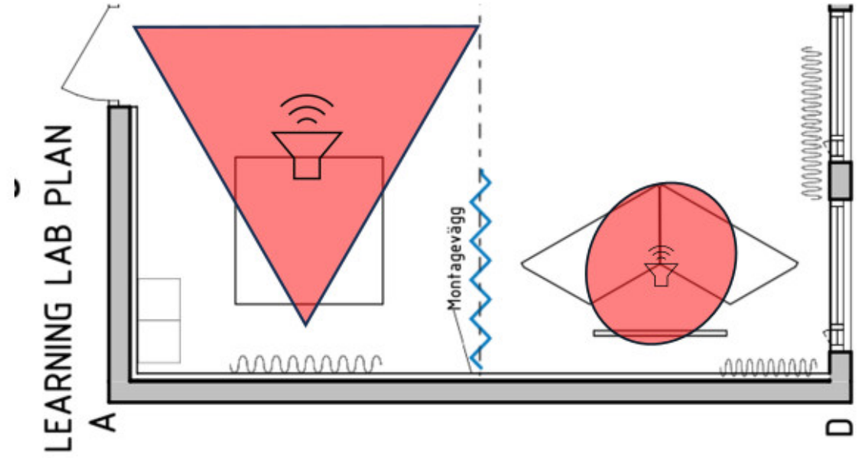
AKADEMISKA HUS

Iteration 1 Group technology



Iteration 2 Group technology





Technology that replaces BYOD and enhances the sense of proximity and connection for all

Experiences from teaching in a hybrid learning environment

- Teachers spend extensive **time** preparing and implementing hybrid instruction
- Hybrid teaching places **high demands on the teacher's pedagogical, technical and spatial competence**, that is to implement an educational idea
  - in different rooms
  - with different groups of students
  - who communicate via different forms of media
- The conditions for social interaction are important !
- Hybrid teaching places **high demands on the support** which cannot be too general but **need to be technologically-pedagogically** innovative with a basic competence in the challenges of hybrid teaching.

Project Website:

Project Video:

Hochschule für Technik
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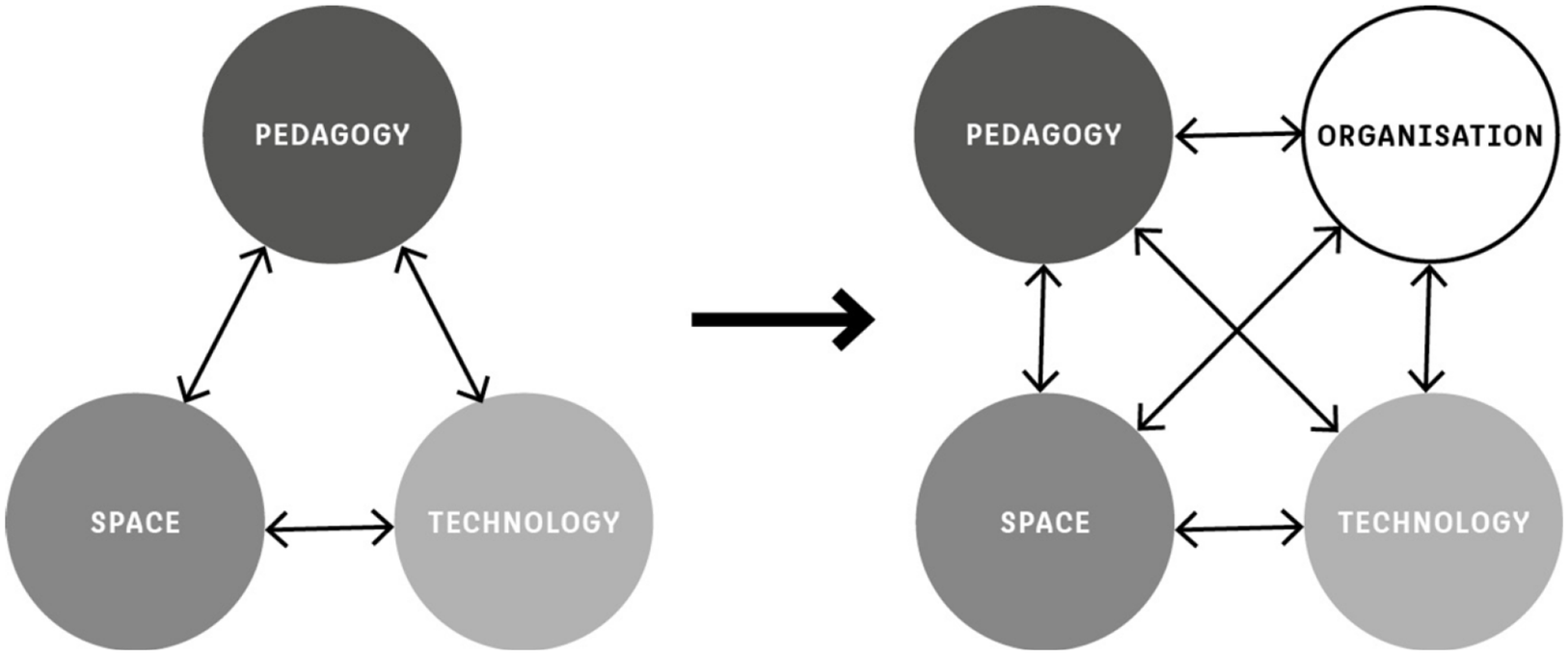
Designing Innovative Learning Spaces

Interdisciplinary project (2021 – 2025)
Collaboration across two faculties of Engineering and Design & Culture

Research question
Which **strategies, processes and structures of learning space design** ensure the sustainable and innovative implementation of **hybrid and student-centered teaching/learning settings**?

Objectives
Providing a **field of experimentation** for the **development, modelling, implementation and evaluation of four model spaces** with using the POST perspective (pedagogy, organisation, space, technology)

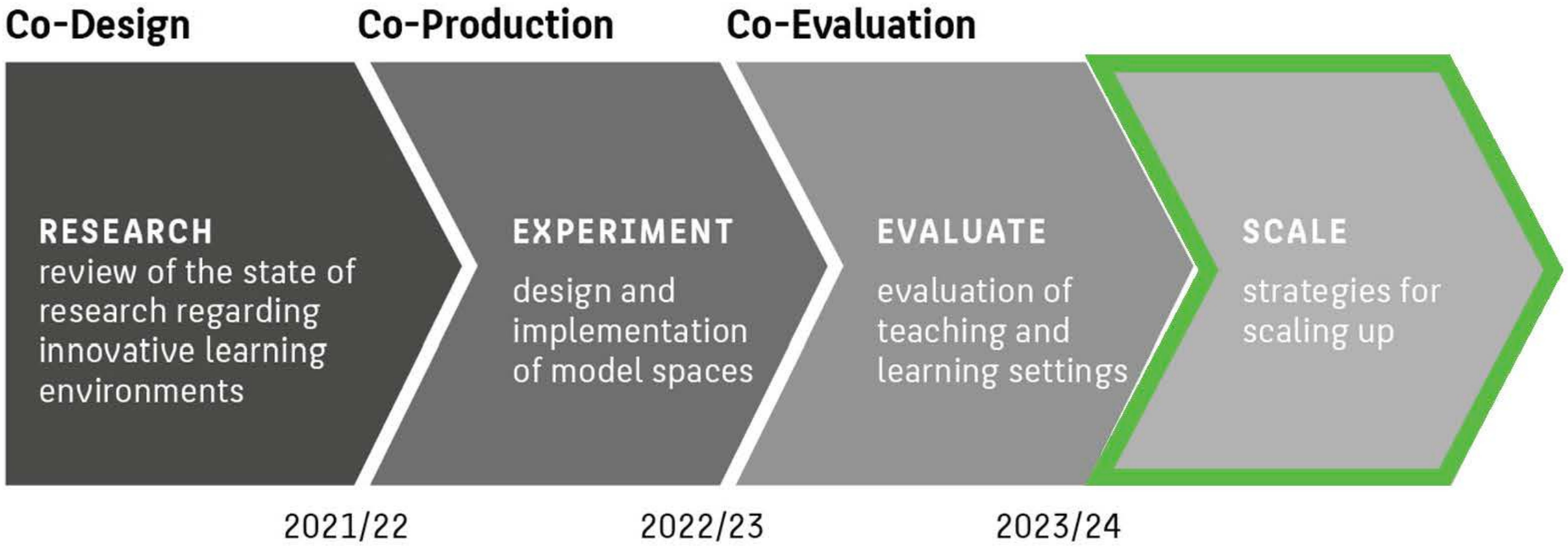
PST framework → POST perspective



Sources: Radcliffe, D. (2009), A Pedagogy-Space-Technology (PST) Framework for Designing and Evaluating Learning Places / Ninnemann, K. (2022) Perspektive Lernraumorganisation / Ninnemann (2024) Zur Relevanz der DORT-Perspektive

Real-world laboratory

Conceptualisation as a real experiment which uses scientific methods for complex transformation processes (cf. Schneidewind)



Source: Schneidewind (2014), "Urbane Reallabore – ein Blick in die aktuelle Forschungswerkstatt", pnd online III. 1–7.

Co-Design: research & participatory processes

- **Inventory of existing formal learning spaces** at HTW Berlin, campus Wilhelminenhof
- **Analysis and transfer of central research insights** according to the aspects of POST perspective

- **25 qualitative interviews** (21 lecturers, 4 courses with a total of approx. 48 students)
- **Creation of real personas** for students and lecturers
- Exchange and discussions with relevant **stakeholders**

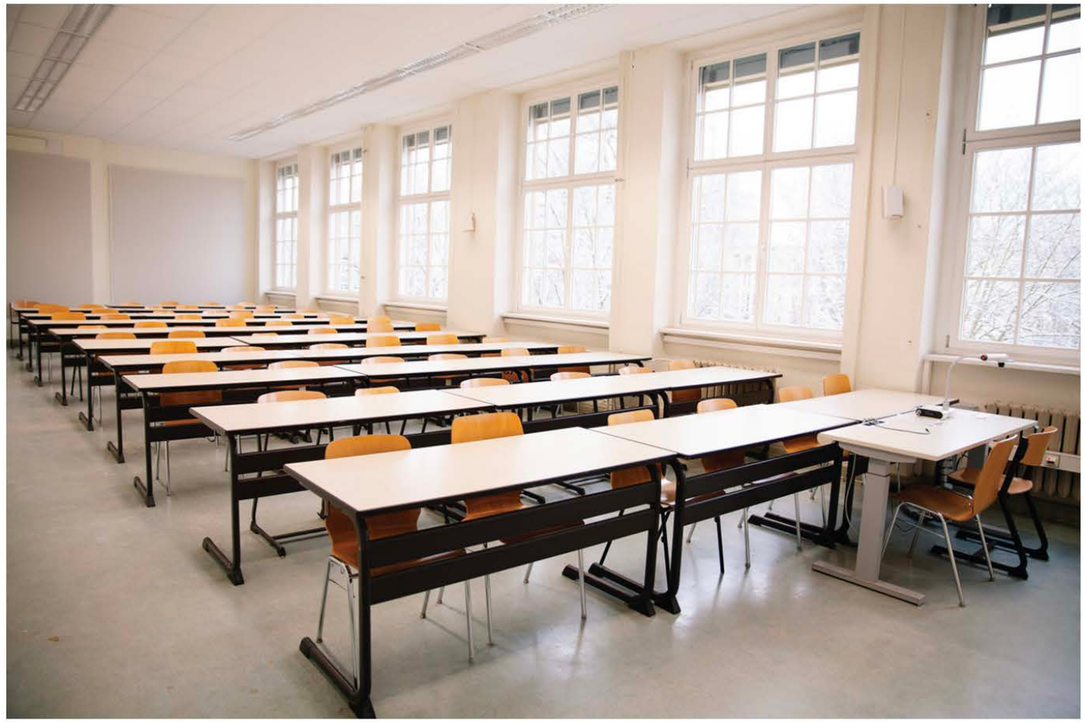


Photo: Learning Space, HTW Berlin

Conceptualisation of central principles

POST perspective

Pedagogy

- Enabling **student-centred teaching, learning and examination** scenarios in hybrid settings
- Support of four **central didactic modes**: Input, Teamwork, Share, Discussion
- Awareness of **different needs** of various **disciplines and cultures** at faculties

Organisation

- Integration of the model spaces into **regular course and room management**
- **Communication of concepts and activities** to link pedagogy, space and technology
- Access to the model spaces **as informal learning environments** for students

Conceptualisation of central principles

POST perspective

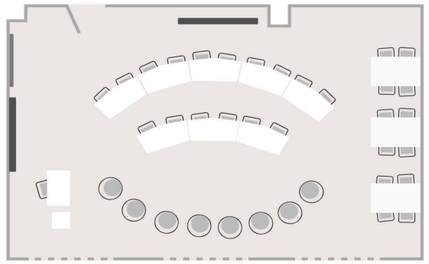
Space

- Spatial **dissolution of frontally-organised teaching** and learning settings
- Learning space **design based on current research**
  → 2 Flexible Learning Environments
  → 2 Active Learning Environments
- **Barrier-free** use of the model spaces

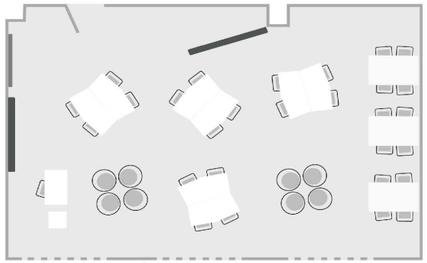
Technology

- Equipped for **analogue and hybrid** teaching and learning settings
- **Plug & play** (USB-C, BYOD)
- **No personnel support** or additional resources for the use of technology

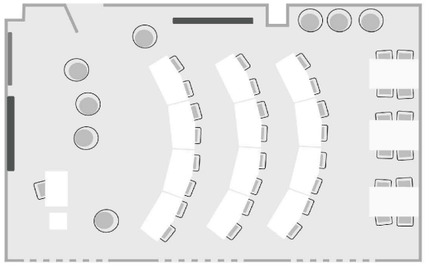
Flexible Learning Environment



Discussion



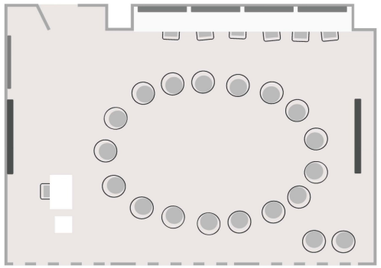
Teamwork



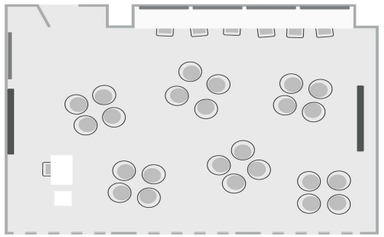
Input

Figure: Floor plans and implementation of model space WH C 261

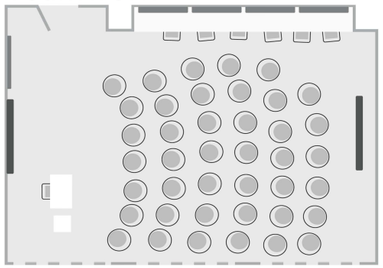
Flexible Learning Environment



Discussion



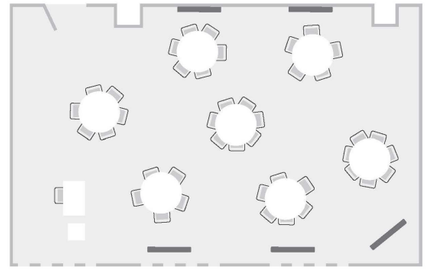
Teamwork



Input

Figure: Floor plans and implementation of model space WH C 227

Active Learning Environment



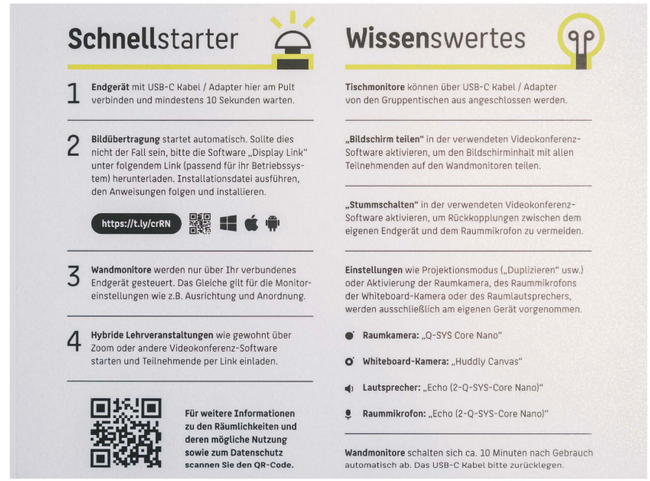


Figure: Floor plans and implementation of model space WH C 260

Active Learning Environment

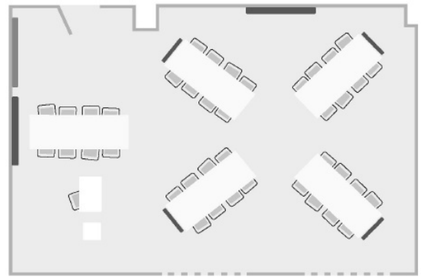


Figure: Floor plans and implementation of model space WH C 262

Co-Evaluation: User experience perspective

Mixed method approach

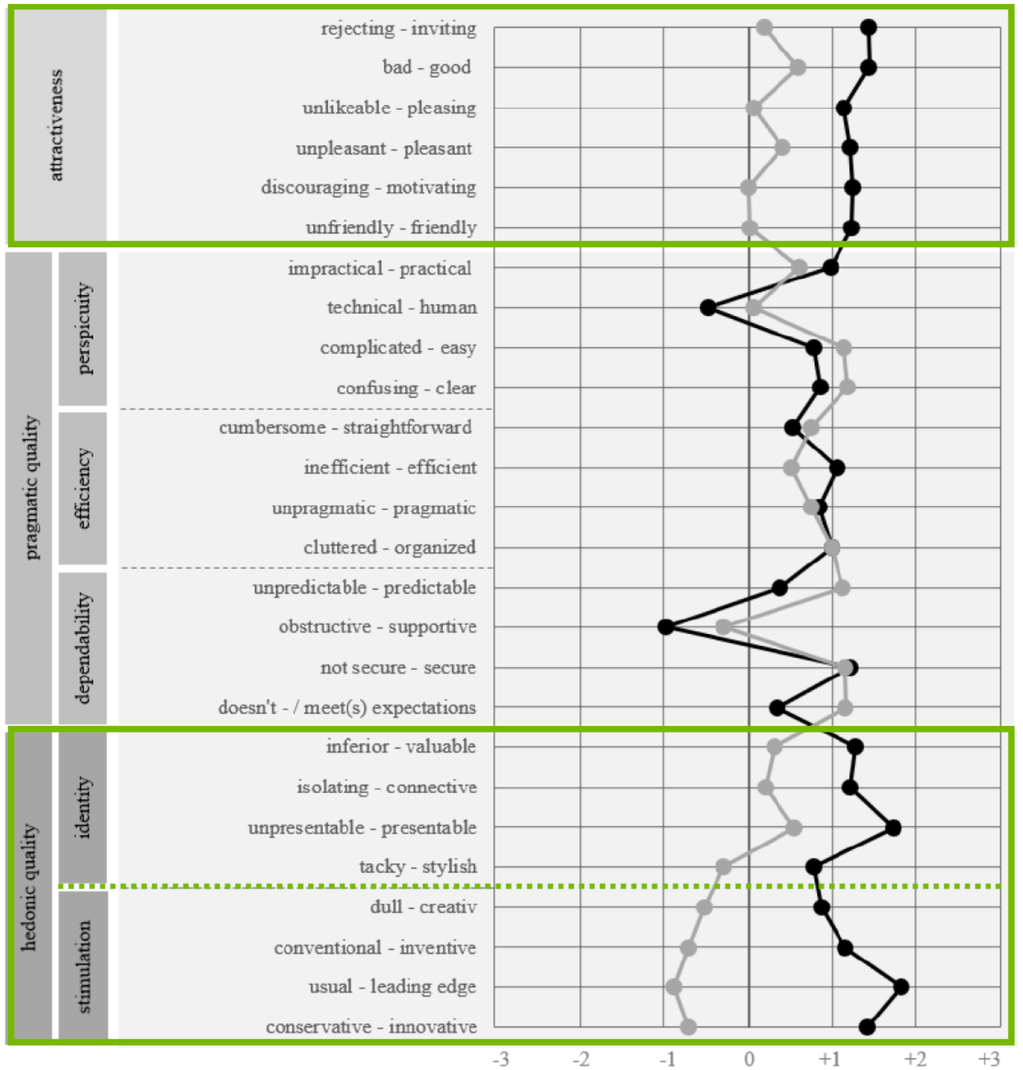
- Explorative, qualitative methods
  (semi-standardised interviews with 7 student cohorts and lecturers n = 9)
- Quantitative user experiece survey (students: n = 191 / lectures: n = 47)

Quantitative survey (May to June 2023)

- Standardised **user experience questionnaires** (Hassenzahl et al., 2003; Schrepp et al., 2014)
  from the field of human computer interaction
- Adapted to the context of learning and working environments (cf. Ninnemann & von Blohn, 2021)

- Polarity profile with 26 bipolar items
- Three dimensions: - **attractiveness**
  - **pragmatic quality** (functional aspects)
  - **hedonic quality** (emotional aspects)

User experience perspective



- **model spaces** are perceived **significantly more positive** in all criteria of **attractiveness** and **hedonic qualities**
- largest differences in the criterion **stimulation**: **model spaces** score consistently **positive** (leading edge, innovative, inventive, creative) and the **seminar rooms** consistently **negative** (usual, conservative, conventional, dull).

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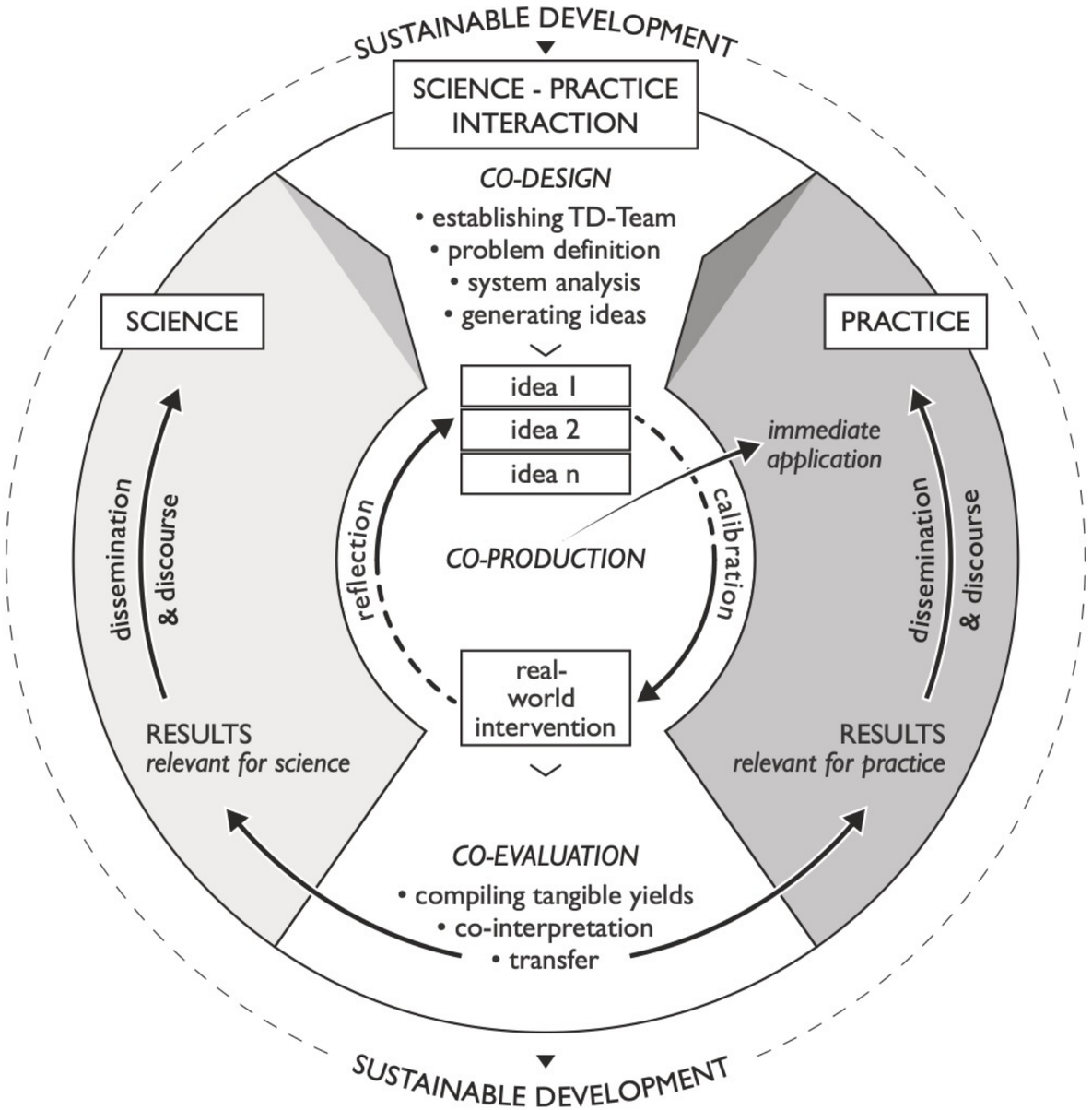

SUSTAINABLE DEVELOPMENT
SCIENCE - PRACTICE INTERACTION
CO-DESIGN
• establishing TD-Team
• problem definition
• system analysis
• generating ideas
SCIENCE
PRACTICE
idea 1
idea 2
idea n
immediate application
dissemination & discourse
reflection
calibration
CO-PRODUCTION
real-world intervention
RESULTS relevant for science
RESULTS relevant for practice
CO-EVALUATION
• compiling tangible yields
• co-interpretation
• transfer
SUSTAINABLE DEVELOPMENT

Scope and goal

Student-centred and hybrid learning environments at universities

Phases

PRE-CONDITIONS

1. CO-VISION

2. CO-DESIGN

3. CO-PRODUCTION

4. CO-EVALUATION

FUTURE SCALE-UP

Umeå University
Learning Lab
Hybrid Umeå
(2021-2025)

Experiences and insights at HTW Berlin (2021-2025)

Real-world laboratory
Innovative Learning Space Design

Umeå University

- **Rigid and non-integrative organizational structures** hinder interdisciplinary collaboration and limit innovation in the development of learning environments..
- History of **experience in co-designed** pedagogical and research development **cross-disciplinary projects**
- Highly **motivated individuals** who recognize the **potential for change** and are committed to the spatial development of learning environments

HTW Berlin

- Missing **organizational structures for interdisciplinary, cross-departmental collaboration** to innovate learning environments
- Highly **motivated people/teams** who see the **potential for change** and are committed to the spatial development of teaching and learning environments

Umeå University

- A **shared vision** within the organization regarding the project's objectives and desired outcomes
- Support and encouragement from facility owner

- The project aspired to integrate a **research-oriented perspective** into its framework
- **Allocated budget** for pedagogical-and technical **support and adjustments of the learning environment**

HTW Berlin

- Lack of **overarching strategy for campus development** that promotes teaching and learning
- Lengthy **Negotiation processes** for locating spaces that are suitable and available to be equipped as innovative learning environments

- **Support and encouragement from a network** of (national and international) innovators, experts and practitioners

Umeå University

- Technical innovation posed challenges in aligning new ideas with existing organizational structures and support systems

- A **participatory process**, leading to **high acceptance** within the organization.
- Inventory and analysis of **users needs** and stakeholder requirements
- Research of technical solutions for hybrid settings
- Analysis and synthesis of current research on learning space design

HTW Berlin

- **Spatial inventory and analysis** of formal learning environments on the campus
- Data collection and **analysis of user needs** an stakeholder requirments
- Research of **techical solutions** for hybrid settings

- Analysis and **transfer of the state of research** on learning space design
- **Conception** of the model rooms

Umeå University

- Early adopters ensured high acceptance, but failed to reach the wider teaching population
- Technical support was limited to the learning lab, not extending to other rooms with hybrid capabilities
- **Technical issues** due to differences in ubiversities terms of service and quality standards

- Early adopters ensured high acceptance
- Continuous research-informed dialogue with teachers throughout the project

HTW Berlin

- **Reality check -** Translating needs/concepts into facts/objects
- Coordination of **measures and deadlines with administration** during implementation

- **Technical issues**: Universities differ in terms of (service) quality standards --> Challenges to **integrate /support technology**
- Challenging discussions: Does **technology really makes sense**? **Do we really need** what kind of technology?

Umeå University

- The BYOD model proved impractical due to the wide variety of incompatible devices
- Transfer of practices to other spaces

- Resources were allocated for a research-based evaluation by researchers
- **Continous dialogue** with teachers and students
- **Allocated resouces**, **enabled changes** to the hybrid learning environment (technique and furniture). **provided** tecinical and pedagogical **support**

HTW Berlin

- Resources for evaluation to support **usage, operation and modification** of innovative teaching and learning settings

- Lack of **resources for useful adjustments**
- Only "**downshifting" measures** possible - particularly necessary in the event of technical problems

- Evaluation of the model spaces shows the **relevance for changing teaching/learning environments**

Umeå University

- Challenges in coordinating all necessary perspectives within the organization.
- How to integrate the Learning Lab space can into existing organizational structures.
- Innovation projects create demands that exceed the organization's current capabilitie

- Teachers and students place high value on participatory co-design and diverse learning environments

HTW Berlin

- **How do we transfer the model spaces into existing structures?**
- Challenges to bring all necessary perspectives (pedagogy, space, technology, organization) together in adminstration
- **Innovation projects create "new needs"** (booking of seminar rooms with different layouts) but **adminstration has no answers (yet)**

- Students & faculty value the model spaces to support **diversity in learning & teaching**

Similarities

- **Adminstration processes and structures at universities are a huge barrier for innovation/change**
- **The projects cause or show the need for learning spaces innovations (changing/special needs for teaching)**
- Although need for hybrid teaching/learning settings is not that important (anymore) as expected during/after covid-19-pandemic
- **To show the potential of innovative learning spaces it needs to be a participatory process and must be implemented in good quality.**
- **Downshifting of technology** due to missing resources (personell) for service support and maintenance after project ends
- **Challenges in up-scaling model spaces** across disciplines, faculties, campuses

Differences

- Umeå University: high **acceptance** from the beginning, because teachers (early adaptors) were intereste and **previous experiences/projects/research** are a relevant base for the project
- HTW Berlin: in contrast to students, longer **process of habitualisation**, as teachers had no previous experience in student-centred classrooms

- Umeå University: **budget for changes/reconfiguration** as a result from evaluation insights (more cameras/screens for hybrid settings, furniture)
- HTW Berlin: as **no budget for adjustments** only "downshifting" measures were possible

1 CO-VISION

A

B

Holistic, university-wide strategies for designing the university as a learning space is required

Clear responsibilities and accountabilities must be coordinated and bindingly agreed upon

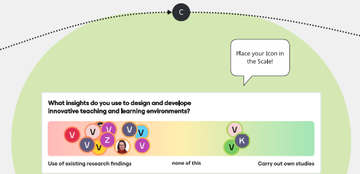
Organizational structures at university administration which links **pedagogy, space, technology and organization**

Community building with relevant stakeholders and a **top-down bottom-up approach**

5 min

2 CO-DESIGN

C



Participation with different user and stakeholder to **analyze needs and requirements**

Desk research first to ground projects on **(empirical) insights and/or good practices**

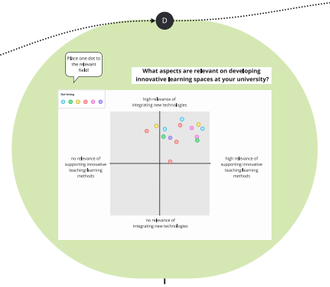
Spatial inventory and analysis of existing learning spaces to find good practices as well as colleagues to build up a network of innovators

Ongoing process of **engaging users to support agency** in the co-design of the project

5 min

3 CO-PRODUCTION

D



Technology is the answer, but what was the question? (Cedric Price, 1966)

User-centred design with focus on user experience to enable innovative teaching and learning methods. **Technology supports user needs**

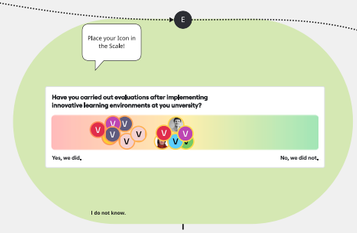
Real-world laboratory projects need to be **integrated into regular administrative/organisational processes and structures from the start** to create clear responsibilities

Introduction of **agile methods in university administration** to respond to changing requirements for processes and structures in innovation process

5 min

4 CO-EVALUATION

E



F

Connect research to the project, and **continue to do research**

Evaluation is VERY important.

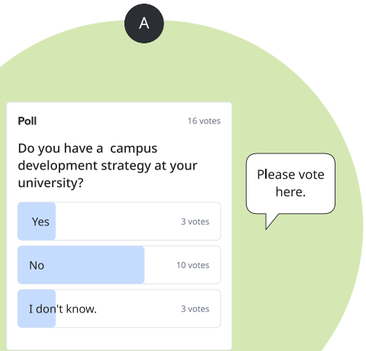
Budget for changes/reconfigurations after evaluating innovative learning spaces is relevant

Importance of **learning space development in a university strategy** to strengthen arguments

5 min

1 CO-VISION

A



Holistic, university-wide strategies for designing the university as a learning space is required

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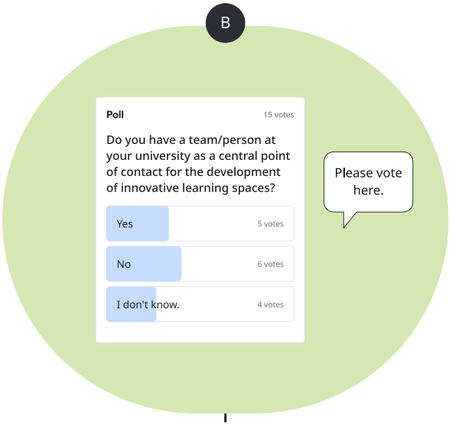
B



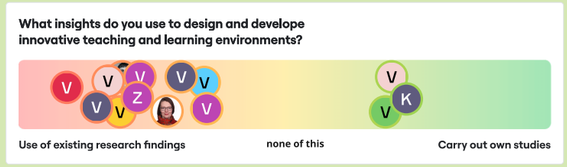
Organizational structures at university adminstration which links **pedagogy, space, technology and organization**

Community building with relevant stakeholders and a **top-down bottom-up approach**

2 CO-DESIGN

C

Place your Icon in the Scale!



comments

Participation with different user and stakeholder to **analyze needs and requirements**

Desk research first to ground projects on **(empirical) insights and/or good practices**

comments

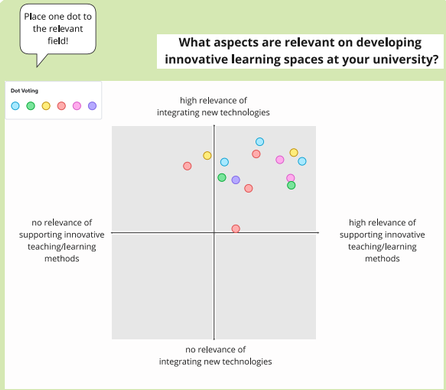
Spatial inventory and analysis of existing learning spaces to find good practices as well as colleagues to build up a network of innovators

comments

Ongoing process of **engaging users to support agency** in the co-design of the project

3 CO-PRODUCTION

D



comments

Technology is the answer, but what was the question?"
(Cedrc Price, 1966)

User-centred design
with focus on user experience to enable innovative teaching and learning methods:
Technology supports user needs

comments

Real-world laboratory projects need to be **integrated into regular administrative/organisational processes and structures from the start** to create clear responsibilities

comments

Introduction of **agile methods in university administration** to respond to changing requirements for processes and structures in innovation process

4 CO-EVALUATION

E

Place your Icon in the Scale!

Have you carried out evaluations after implementing innovative learning environments at you unversity?

Yes, we did. **No, we did not.**

F

Please vote here.

Poll 16 votes

Have innovative learning space concepts already been implemented university-wide?

Yes	5 votes
No	6 votes
Maybe	3 votes
I do not know.	2 votes

comments

Connect research to the project, and **continue to do research**

Evaluation is VERY important.

comments

Budget for changes/reconfigurations after evaluating innovative learning spaces is relevant

Importance of **learning space development in a university strategy** to strengthen arguments