

From Chaos to Complexity – Digital Collaborative Problem designing and interdisciplinary reflexivity

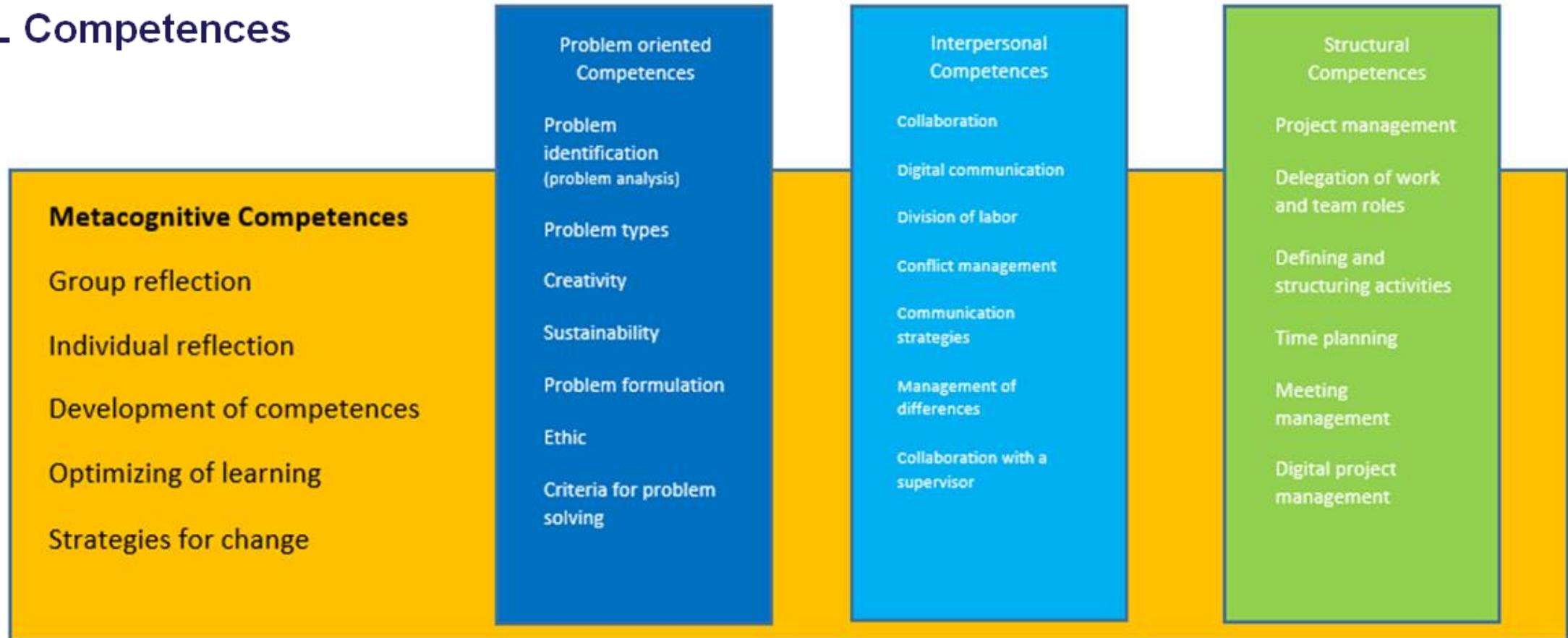
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AALBORG UNIVERSITY
DENMARK

Progressive learning objectives

PBL Competences



The context of the workshop

WORKSHOPS TO SUPPORT STUDENTS' PROGRESSION IN PBL COMPETENCES THROUGHOUT THE STUDY

- INTERDISCIPLINARY TEAMWORK / WORKSHOP I TVÆRFAGLIGT SAMARBEJDE
- INTERDISCIPLINARY PROBLEM DESIGN / ARBEJDE TVÆRFAGLIGT MED PROBLEMDESIGN
- INDIVIDUAL AND GROUP MOTIVATION / ARBEJDE MED EGEN MOTIVATION
- PROFESSIONAL COMMUNICATION AS PART OF PROBLEM BASED PROJECT WORK / PROFESSIONEL KOMMUNIKATION I DET PROBLEMBASEREDE PROJEKTARBEJDE
- DIGITAL METHODS FOR PROJECT WORK / DIGITALE METODER I PROJEKTARBEJDET
- TEAM DYNAMICS / GRUPPEDYNAMIKKER



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The purpose of this workshop is to strengthen the students' development of PBL competences within interdisciplinary problem design. The workshop will be activity-based, with focus on exercises and theory to prepare students for working with interdisciplinary issues, understand their own possibilities and limitations, as well as communication and dissemination interdisciplinary. The workshop will last approx. 3 hours and a central output of the workshop is a better understanding of the students' own and others' disciplines, important to keep in mind when working interdisciplinary. Furthermore, it will be based on the students' existing understanding of problem design as well as an introduction to approaches and understandings of problem types and interdisciplinarity, including the importance of explicit and tacit knowledge (sharing) in interdisciplinary contexts.

Interdisciplinary Problem Design and PBL

▶ Purpose

- ▶ To give students a better understanding of how to cope with complex problem solving
- ▶ To give students tools and methods for collaborative problem designing and how to clarify and understand relations and points of interest to other disciplines within the given problem area

▶ Scope of the workshop

- ▶ Three hours workshop
- ▶ Digital participation – Covid 19
- ▶ Students participated in disciplinary groups
- ▶ Lectures and case work
 - Point of departure in their understanding of interdisciplinarity
 - Lecture on interdisciplinarity and complexity
 - Case work on interdisciplinary problem design
 - Lecture on points of attention in relation to interdisciplinary work
 - Group work in relation to their semester projects
 - Wrap up and reflection

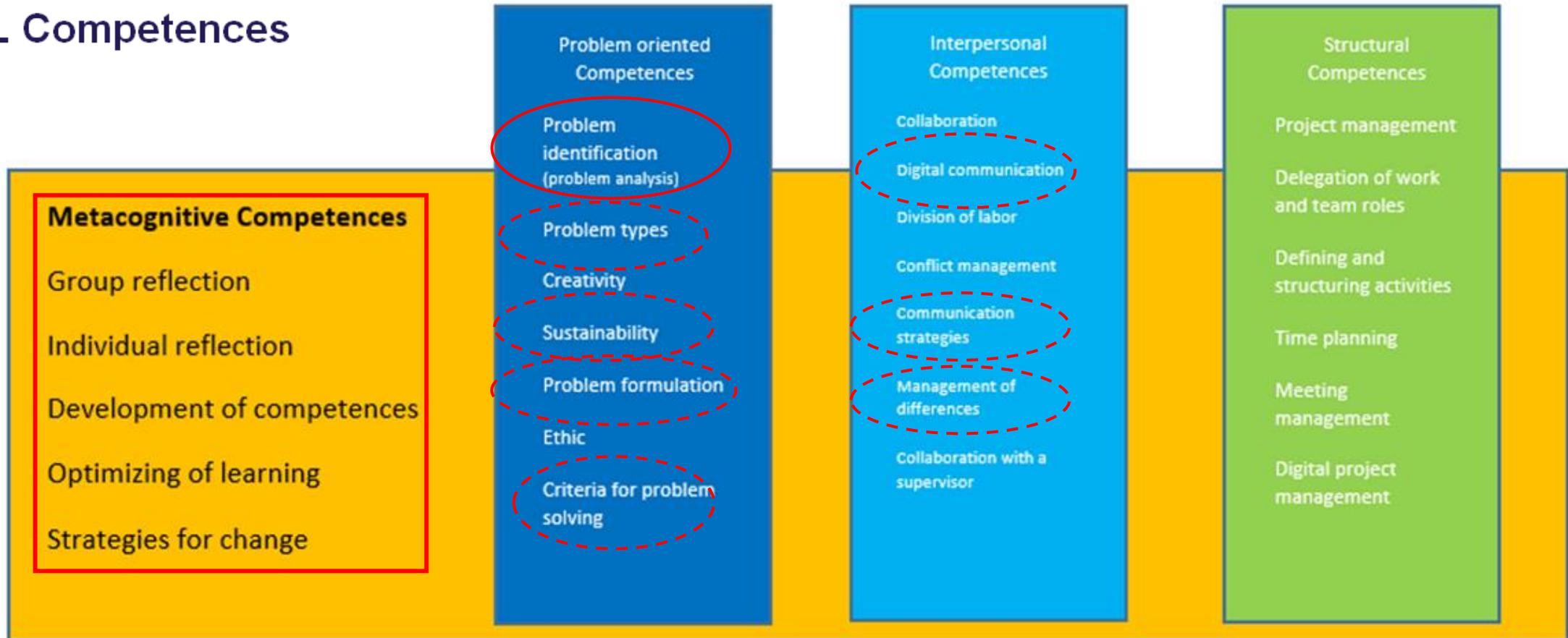


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Progressive learning objectives

PBL Competences



Interdisciplinarity

"Disciplines provide scientists with frames of reference, methodological approaches, topics of study, theoretical canons, and technologies. In addition, they provide shared concepts and language... and, importantly, the epistemological and ontological security that is required to progress science... Yet it is increasingly recognized that, for some of the tasks we expect of scientific enquiry, this is not sufficient... As a result, there has been increasing interest over the last decade both within the scientific communities and funding bodies in developing ways of integrating the research outcomes from disciplinary research, thus breaking down the methodological, epistemological and ontological boundaries that prevent shared understandings of complex issues."

Stock and Burton, 2011

Interdisciplinarity aims to minimize grey zones between disciplinary fields approaching complex problems

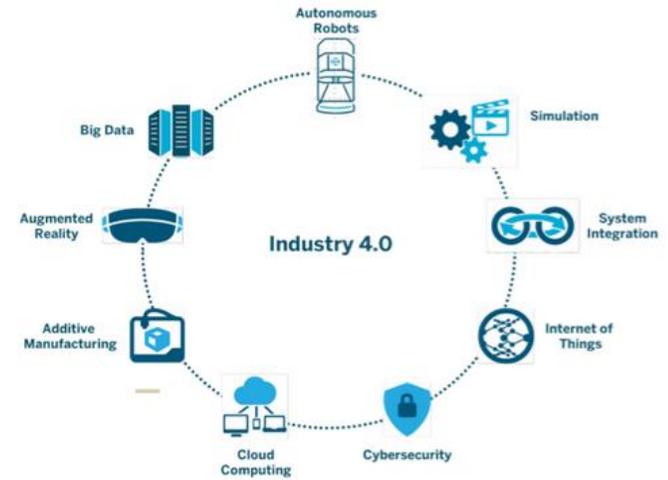


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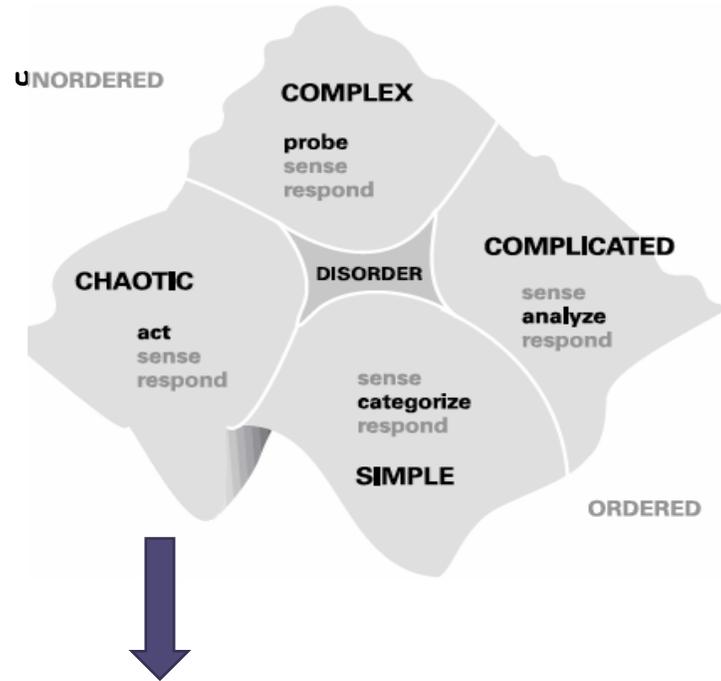
Why do we even talk about interdisciplinarity?

- ▶ Today we try to address challenges like:
 - ▶ Sustainability
 - ▶ Industry 4.0/5.0
 - ▶ Climate changes
 - ▶ Global pandemics



SUSTAINABLE DEVELOPMENT GOALS



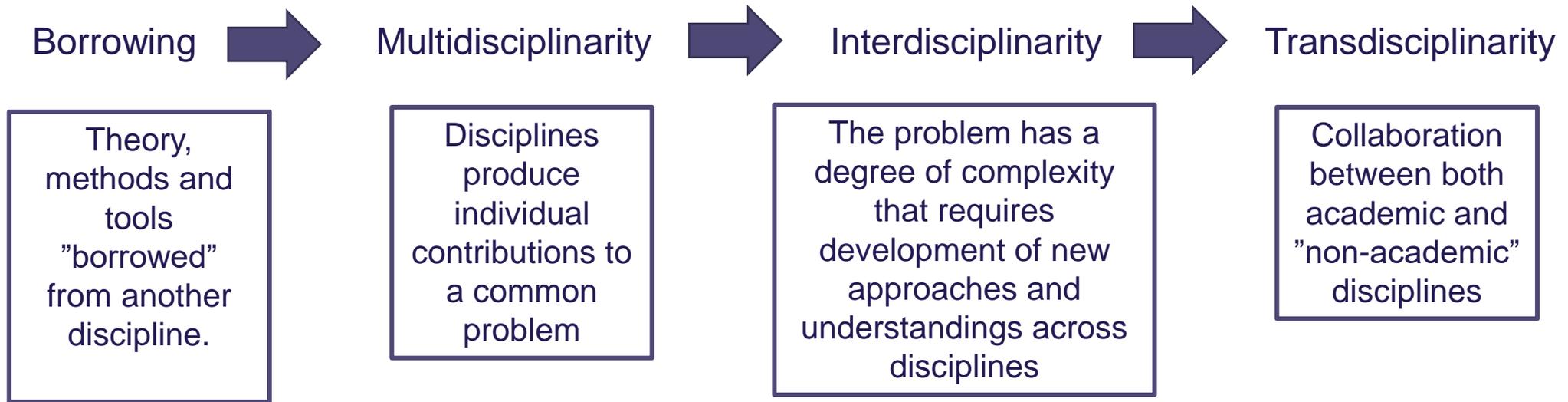


Cynefin framework (Snowdon & Boone 2007)

Problem types	Simple	Complicated	Complex
Project types	Discipline and multiprojects	Interdisciplinary projects Narrow megaprojects	Broad interdisciplinary megaprojects
Problem analysis	Understanding the problems in the discipline domain and how the discipline relates to other disciplines	Understanding problems related to parts of a system or parts of a process by combining a few core disciplines	Understanding problems in a comprehensive system perspective by making a synthesis of different discipline approaches
Problem-solving	Incremental product/service innovation (redesign what is)	Product/service innovation (design to substitute)	System innovation (design to change)
Project management	From stable teams and structures - to - agile systems/flexible structure with ad hoc groups		
Collaboration	From simple collaboration within same knowledge paradigm - to - difficult collaboration with different knowledge paradigms		

Interdisciplinarity

Degrees and approaches to interdisciplinarity:



The meaning of time



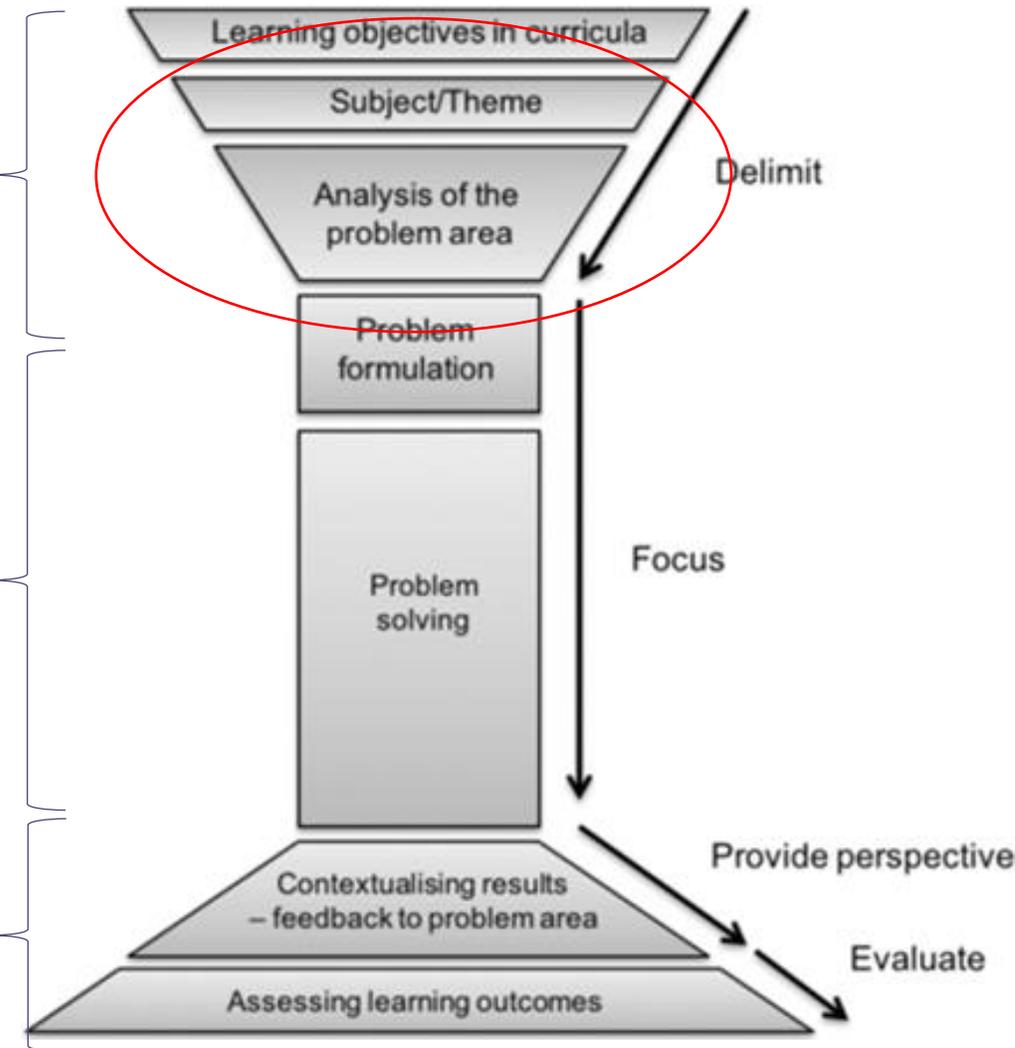
Interdisciplinary problem design/ problem solutions

- Time influences on what degree, and which approach to interdisciplinarity, students should use and approach their project work at different stages.
- The different approaches to interdisciplinarity is determined by the problem formulation and complexity trying to address.

Interdisciplinarity

Disciplinary focus

Interdisciplinarity



How to get started on an interdisciplinary problem identification

► Take point of departure in Covid 19:

1) Make a general brainstorm

- What are the challenges?
- Which elements are needed to solve it?

2) What are your contributions to this case

- What can each of your disciplines give to the case?
- What are your professional competences?
- What kind of knowledge do you need?
- Who are you providing knowledge for?
- What are your possibilities and limitations?

► Work in padlet:

<https://aalborguniversitet.padlet.org/MaikenW/4nzgphga842nmb8l>





Advantages of the digital...

- Scale → MMO collaboration
- Excellent overview despite many participants and multiple points of activity simultaneously
- Quick and efficient editing – Non-verbal communication - no break of flow
- Building and connecting with others simultaneously – dynamic – instant reaction - collaboration



Wrap up

Feedback from students

- *"It can get a bit confusing / too complex"*
- *"In the end I lost the overview"*
- *"Very meaningful, but should be placed earlier in the semester – before problem analysis"*
- *"It is fun and interesting to work collaboratively"*
- *"Gives a lot of inspiration to develop your own problem"*
- *"Would be interesting to try out with more different disciplines"*





Next steps

- ▶ Iterative process – focusing of the problem
- ▶ Develop the focus on the relations between items
- ▶ Being in and understanding complexity
- ▶ Identifying other relevant disciplines
- ▶ Involving more disciplines in one workshop



Discussion

Input from you

- ▶ What are your overall impressions of the activity?
- ▶ How could the workshop be developed further?
- ▶ Good parts / bad parts?
- ▶ Potential?

