

# 1st – 4th Order Knowledge: Learning, Information and Innovation in the Hypercomplex Society


Lars Qvortrup, Dean  
School of Education, University of Aarhus  
Aalborg, April 1st

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## Learning and innovation


- Why?
- What?
- How?

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**WHY?**

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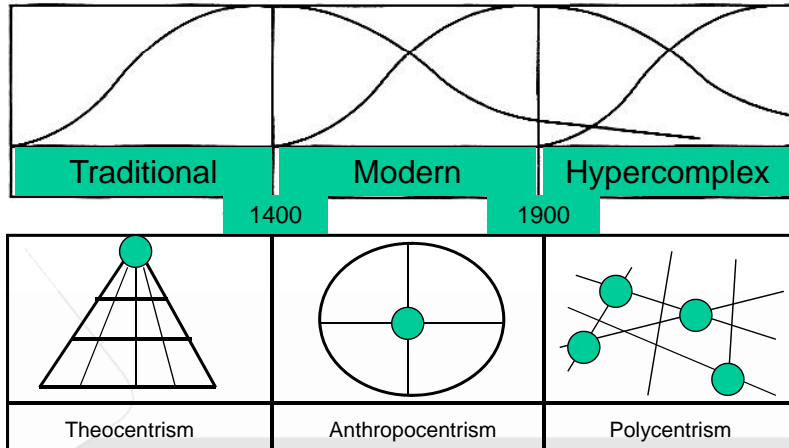


**WHY?**

**THE THEORY OF  
HYPERCOMPLEXITY**

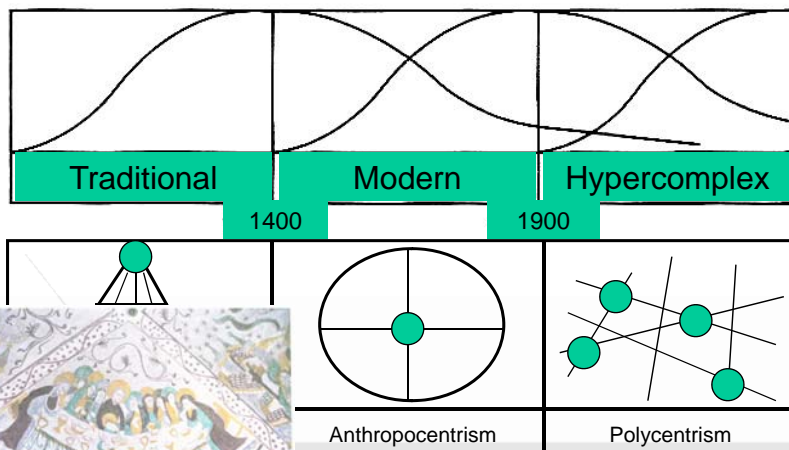
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## Social structures/semantic epistemes




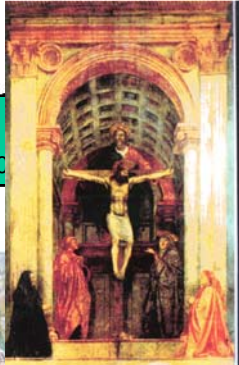
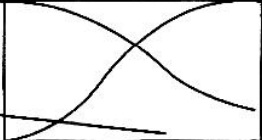


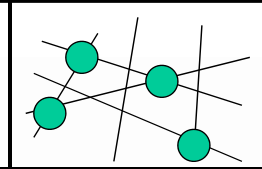
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## Social structures/semantic epistemes

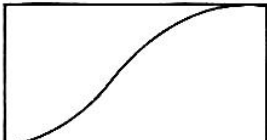
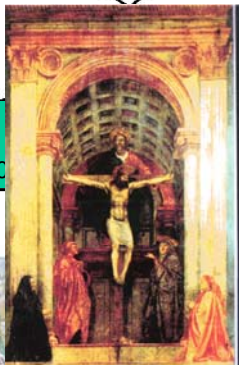

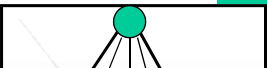
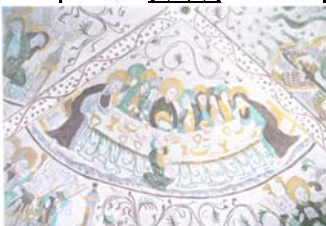


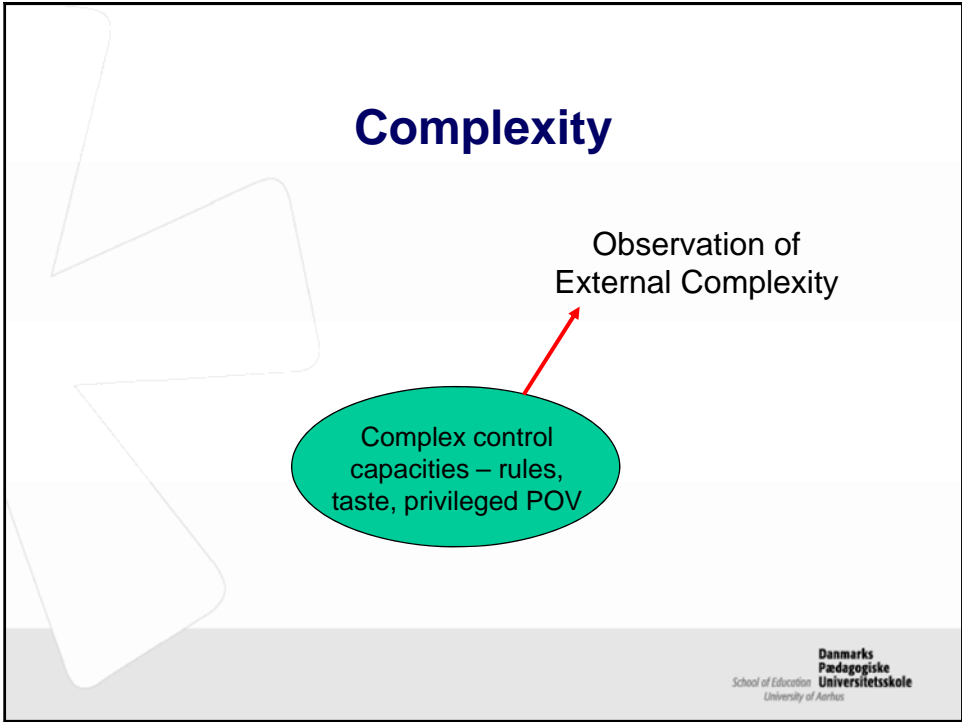
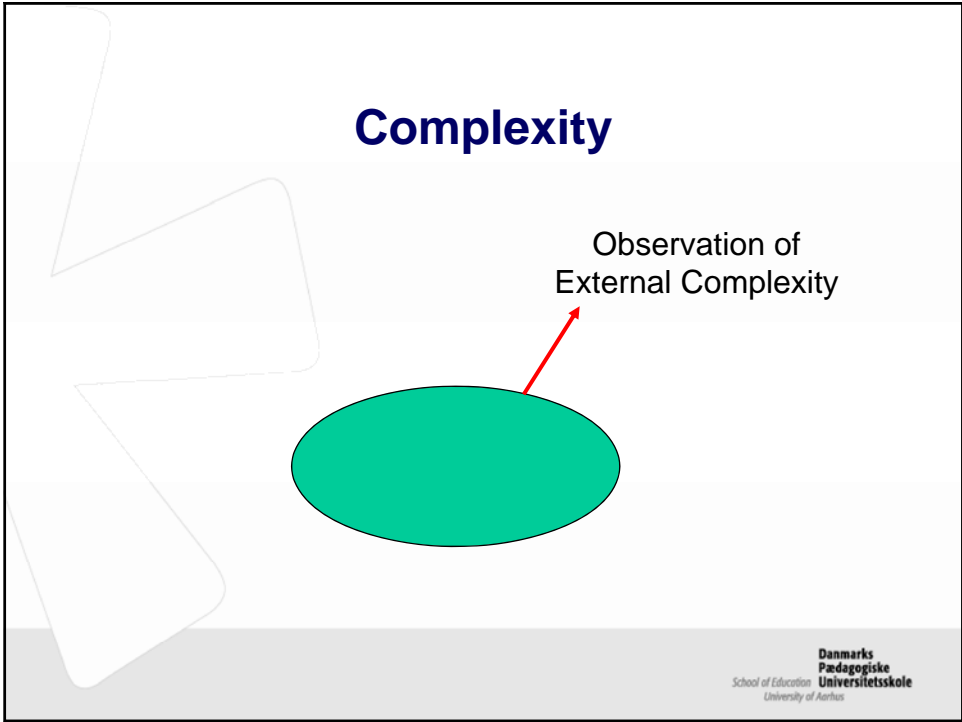
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## Social structures/semantic epistemes

 Traditional 1400		 Hypercomplex 900
 		 Polycentrism
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## Social structures/semantic epistemes

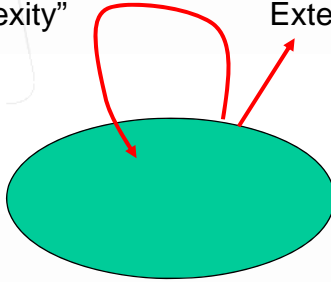
 Traditional 1400		
 		



# Hypercomplexity

Observation of  
"Eigen-complexity"

Observation of  
External Complexity

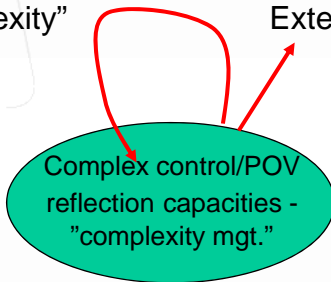


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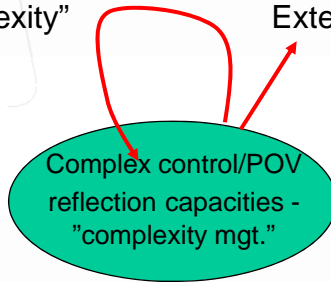


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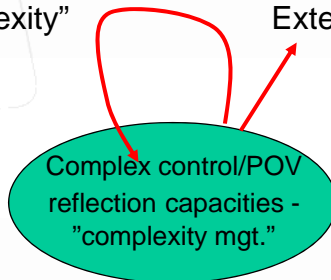


Hypercomplexity = Complexity applied to complexity

# Hypercomplexity


Observation of  
"Eigen-complexity"

Observation of  
External Complexity




Hypercomplexity = Complexity applied to complexity

"The more you know, the more you know that you don't know"



**WHAT?**

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**WHAT?**

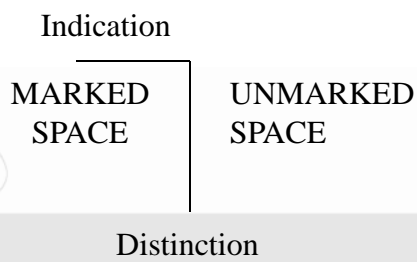
**INFORMATION, KNOWLEDGE  
AND LEARNING**

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# Information

# Information

Cf. Gregory Bateson:  
"Information: A difference that  
makes a difference"



# Knowledge

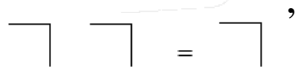
# Knowledge

Knowledge can be defined as condensation of information, i.e. as confirmation of observations.

$$\left[ \right] \left[ \right] = \left[ \right] ,$$

## Knowledge

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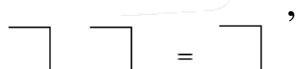


Through

- Memory systems, e.g. documents (time)
- Communication systems, e.g. conversations ((social) space)

## Knowledge

Knowledge can be defined as condensation of information, i.e. as confirmation of observations.



Medium 1: Stability (of physical systems)

Medium 2: Survival (of biological systems)

Medium 3: Planning (based on reflective distribution of probability and risk of psychic/social systems)

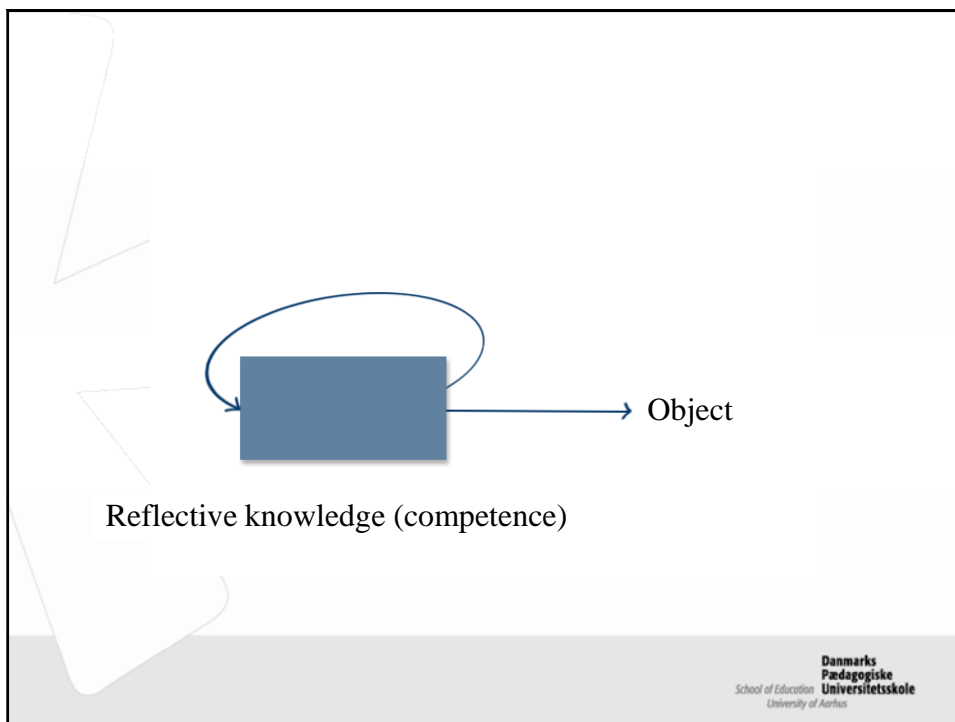
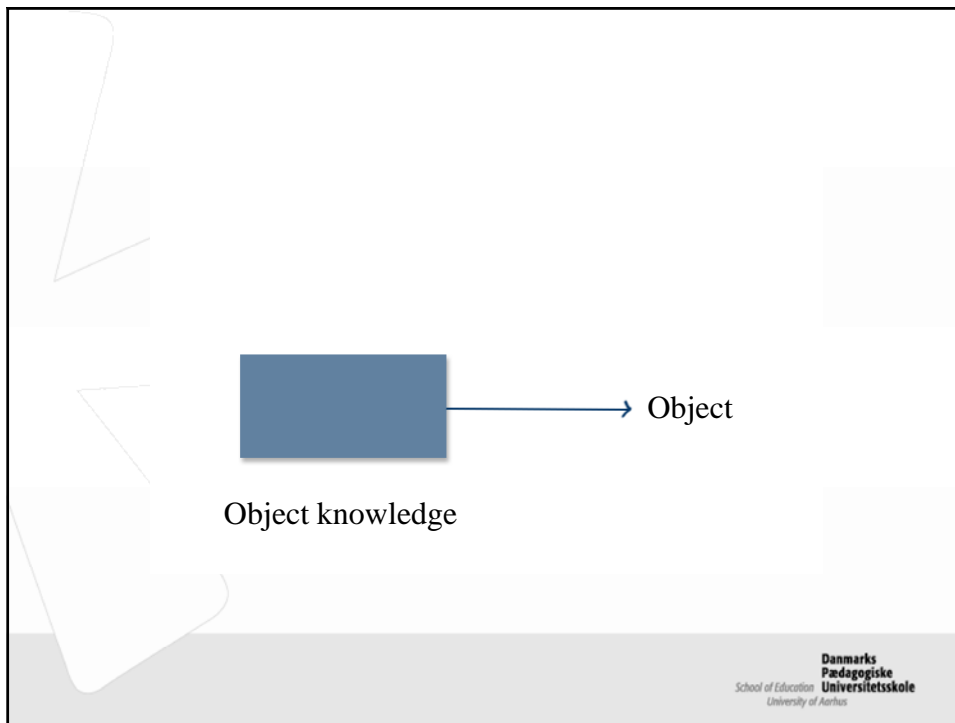
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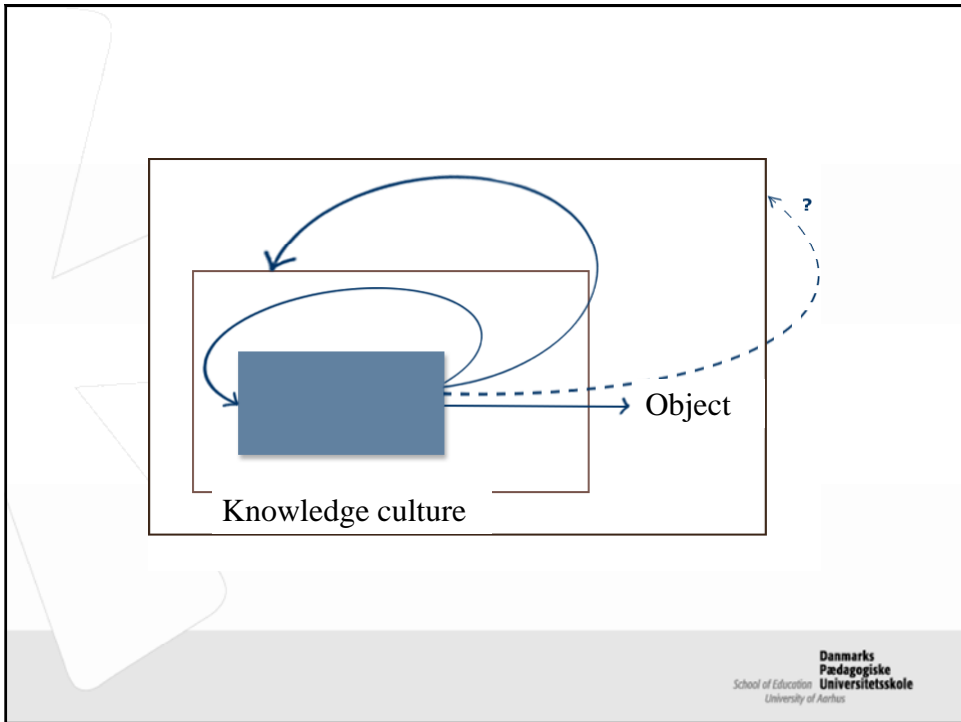
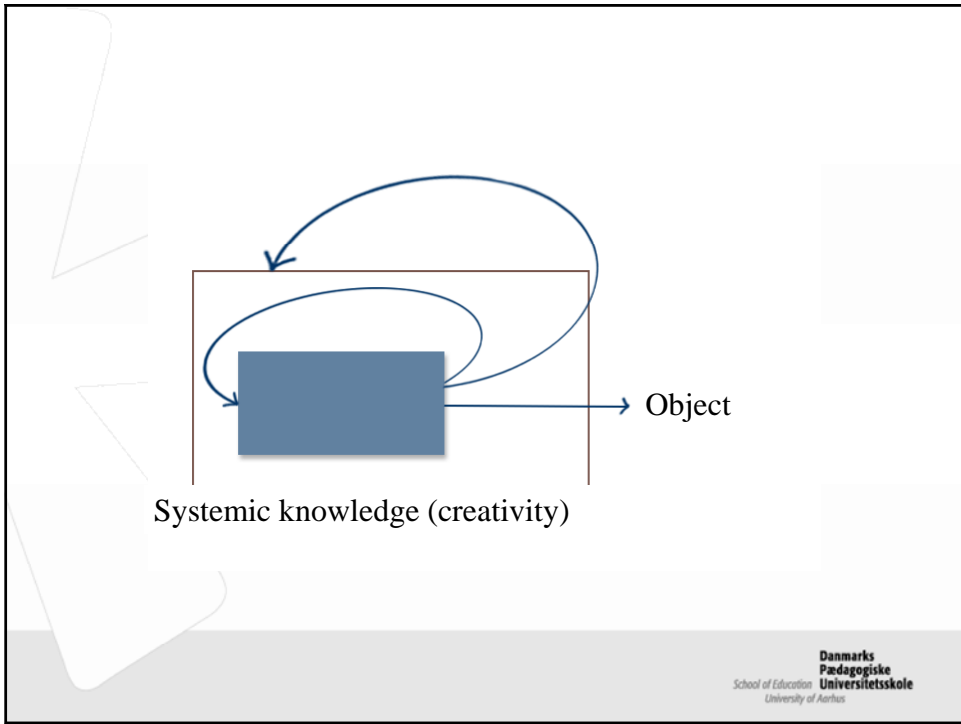
- Memory systems, e.g. documents (time)
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## Knowledge Categories

## Knowledge Categories

- Michel Serres: knowledge does not have a fixed order and a centre, but it arises and exists by virtue of its ‘...momentum, the energy in its motion’ (Serres 1997: 38).





## Categories of knowledge

Knowledge category	Knowledge form	Knowledge designation
1 <sup>st</sup> order or simple knowledge	Knowledge about something	Factual or object knowledge
2 <sup>nd</sup> order or complex knowledge	Knowledge about the conditions of knowing	Recursive or situative knowledge
3 <sup>rd</sup> order or hypercomplex knowledge	Knowledge about the conditions of the reflective knowledge system	Reflective or creative knowledge
4 <sup>th</sup> order knowledge	World knowledge or the knowledge horizon	Evolutionary or world knowledge

## HOW?

### FACILITATION OF CREATIVITY AND INNOVATION

## Categories of knowledge

1. Order Knowl.	Object Knowl.	Data	Art work	Teaching
2. Order Knowl.	Competencies	Methods	Poetics	Didactics
3. Order Knowl.	Creativity	Theories	Aesthetics	Pedagogy
4. Order Knowl.	Culture	Meta-physics	Meta-physics	Meta-physics

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University-based education should  
include all knowledge categories

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## Categories of knowledge

And thus also all learning levels

1. Order Knowl.	Object Knowl.	Data	Art work	Teaching
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## Information Competencies (IC)

IC without context:  
Googling

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Result oriented IC: I-competencies

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Result oriented IC: I-competencies

Question oriented IC: I-creativity

## Information Competencies (IC)

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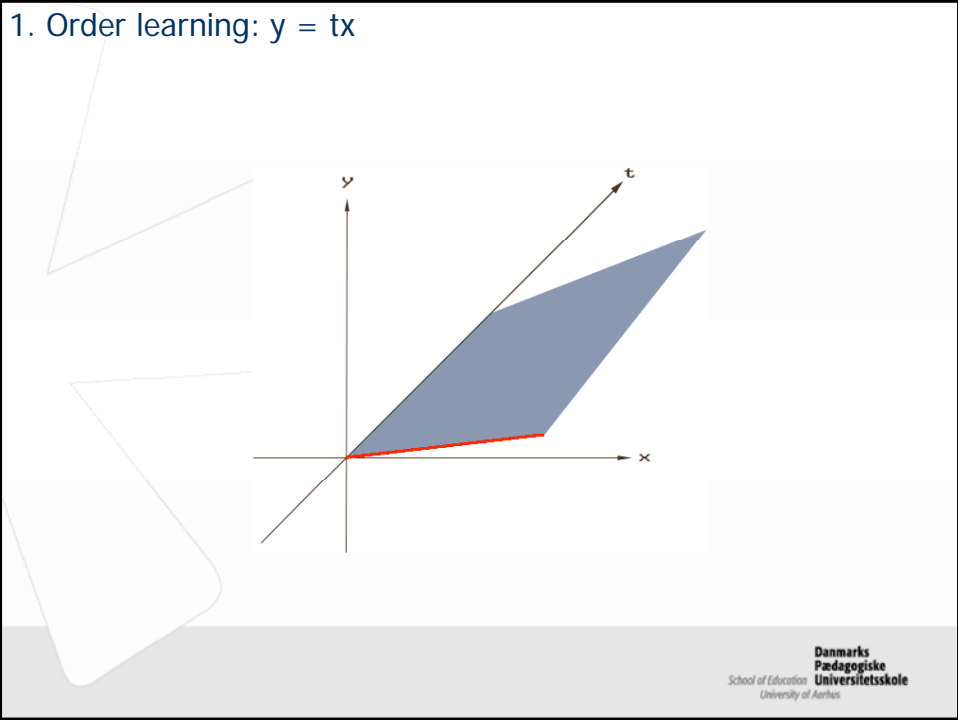
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Result oriented IC: I-competencies

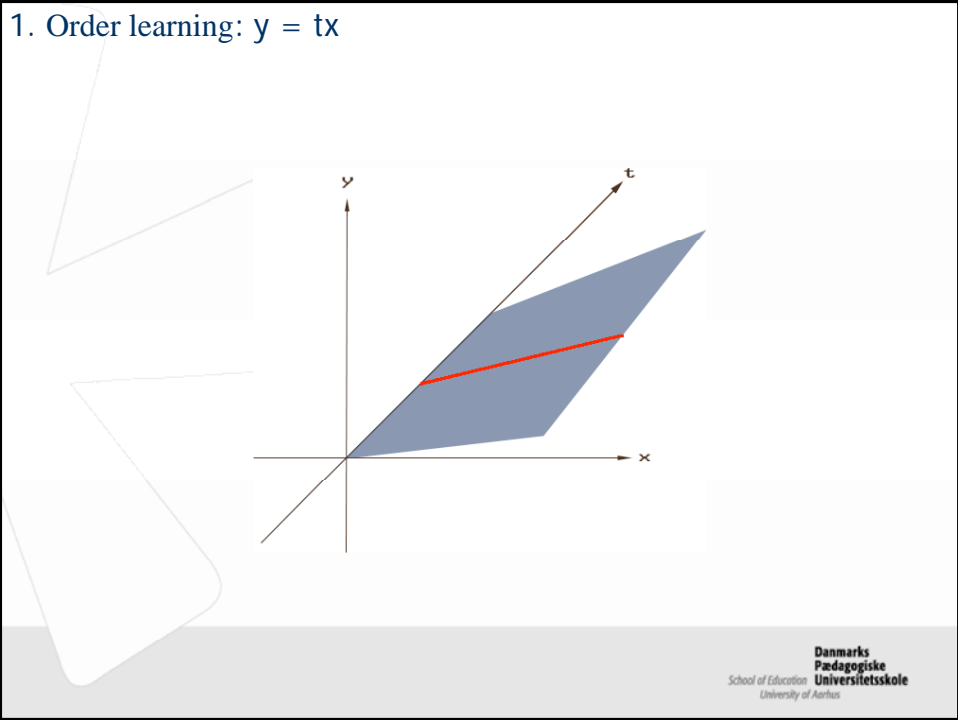
Question oriented IC: I-creativity

IC Culture: The Library as IC supportive environment

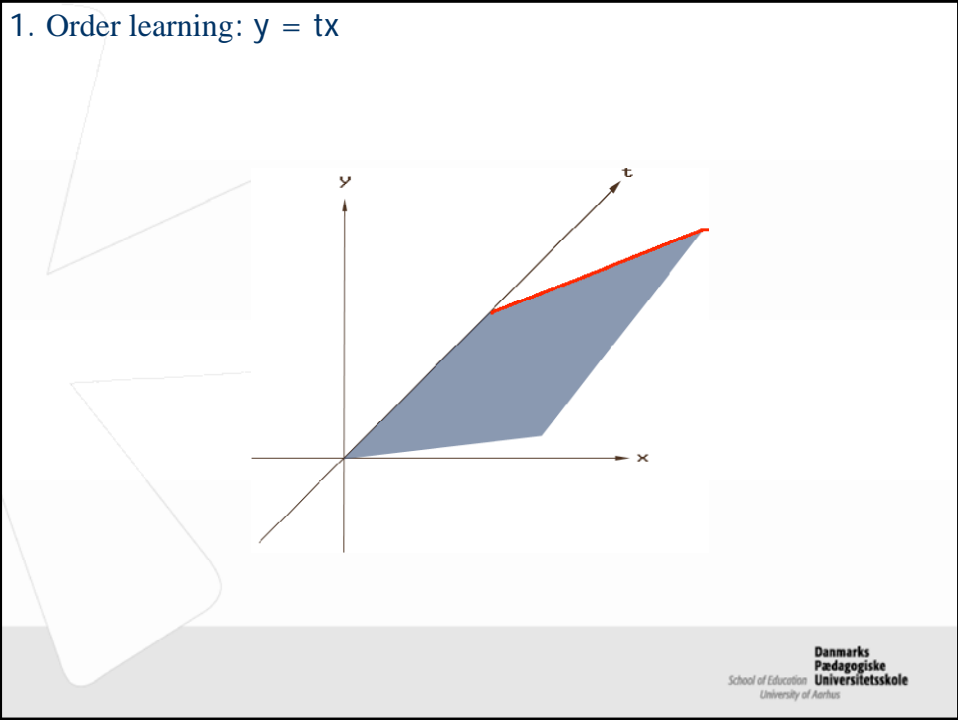
1. Order learning:  $y = tx$



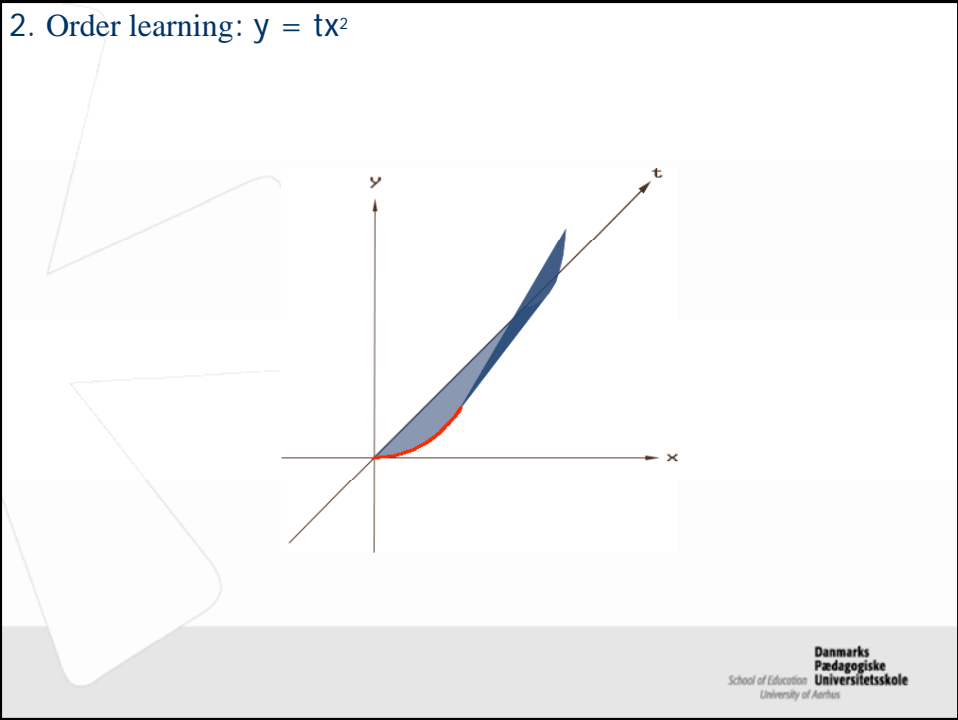
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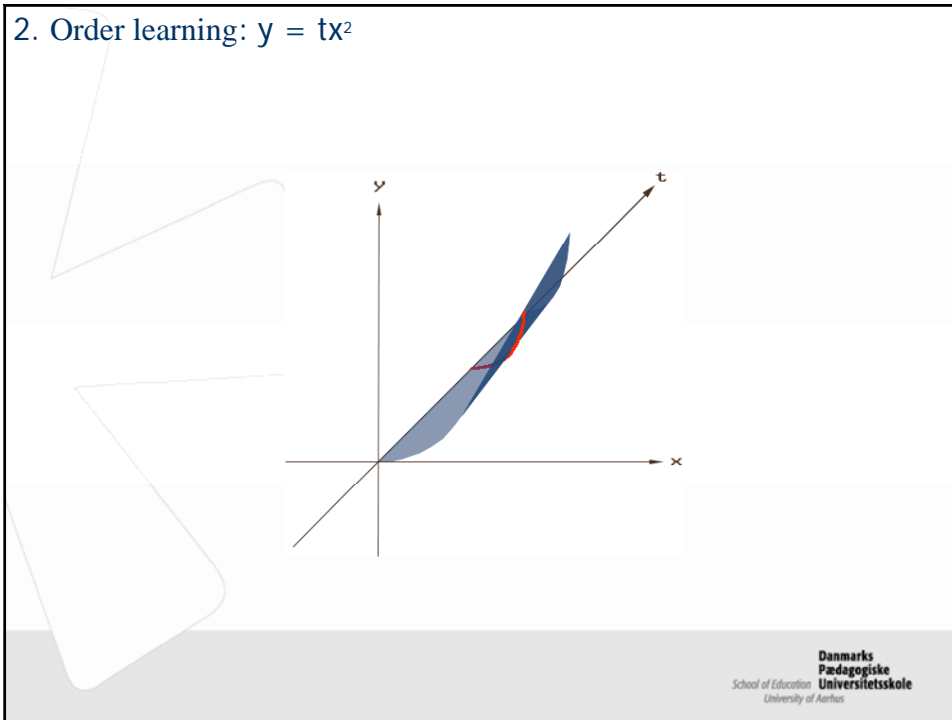
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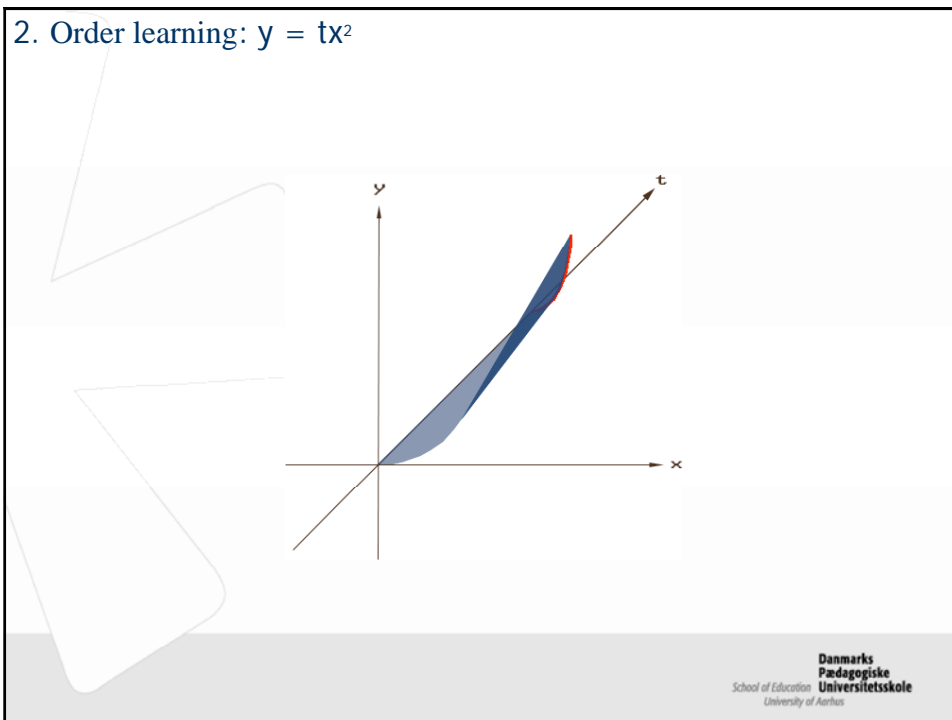
2. Order learning:  $y = tx^2$



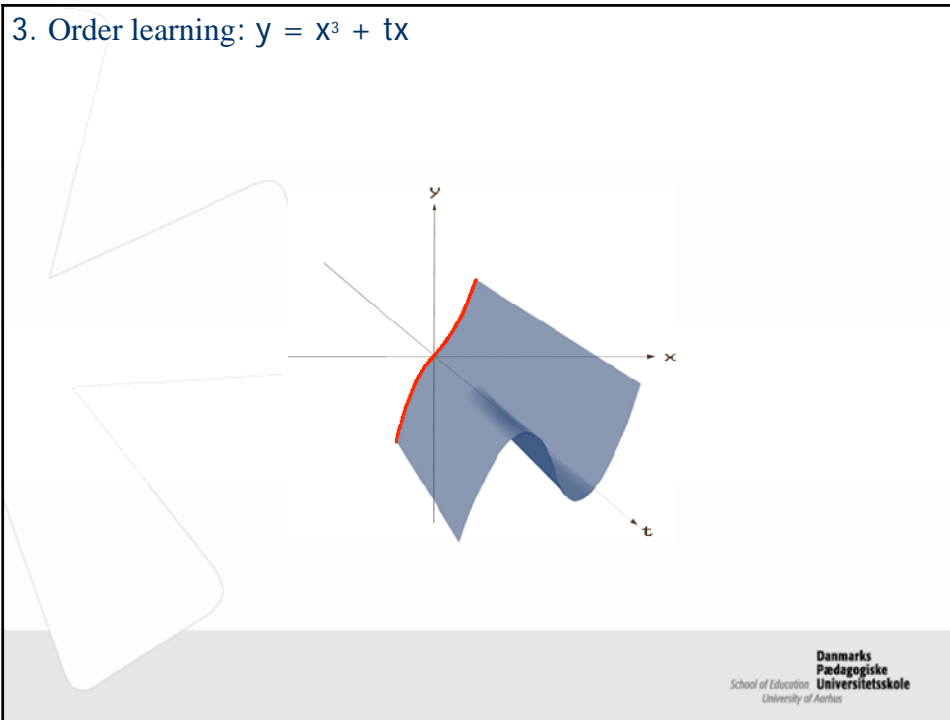
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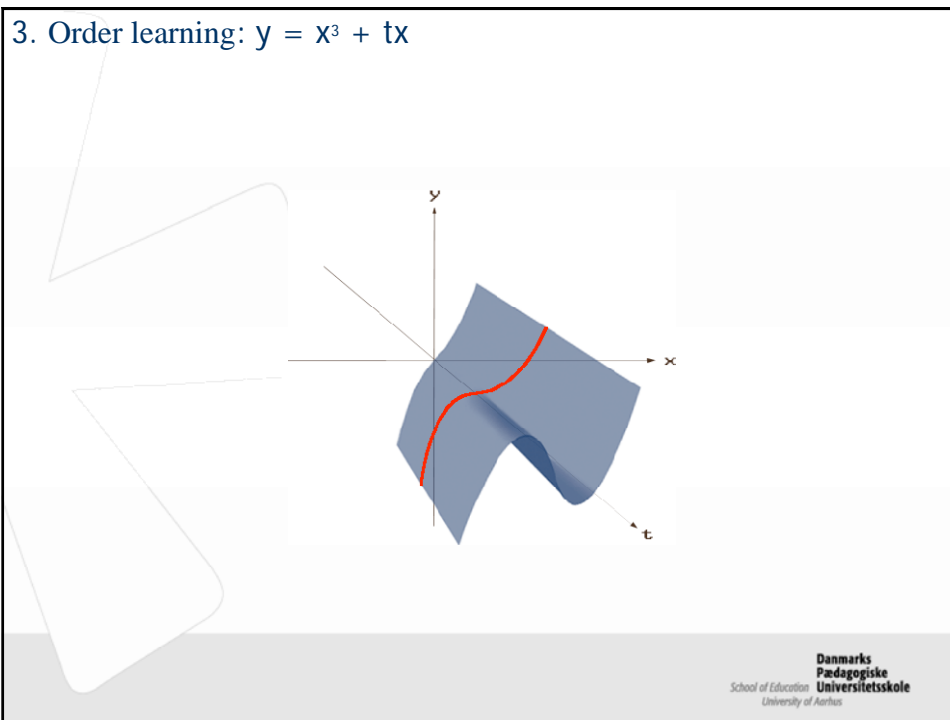


3. Order learning:  $y = x^3 + tx$



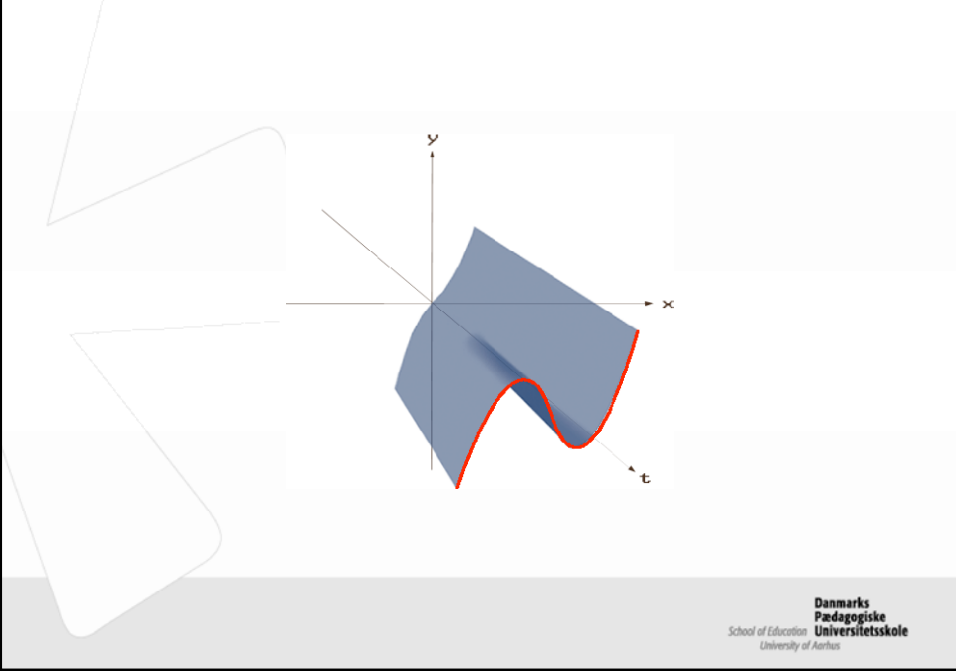
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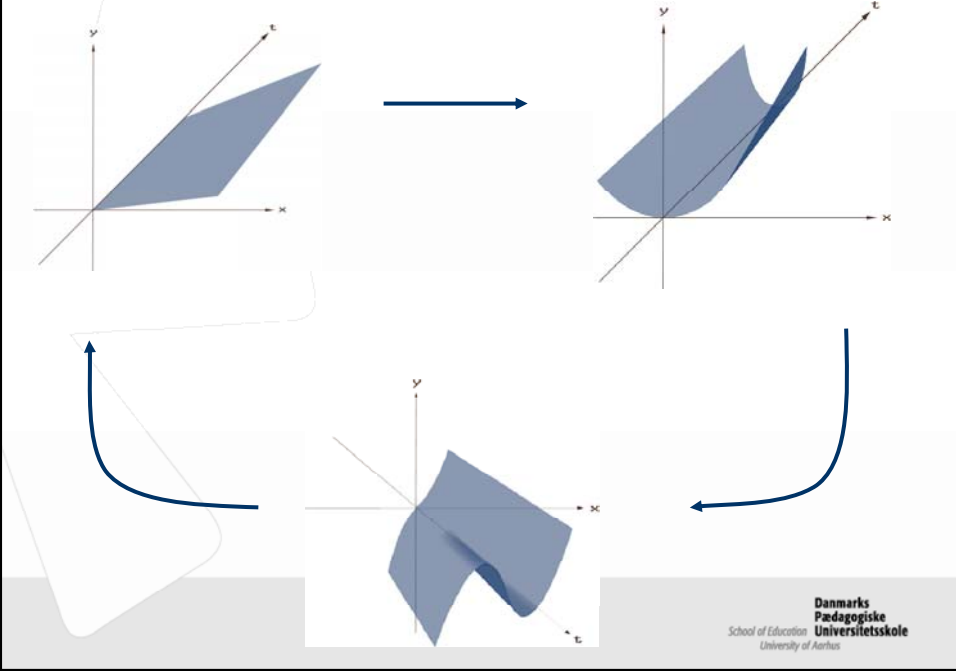


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### 3. Order learning: $y = x^3 + tx$



### 4. Order learning : The learning topology



## The Innovation oriented library

Learning levels	Learning categories	Forms of stimulation	Information and game levels
1. order learning	Accumulation	Information and knowledge access	Game (taxonomical ontology, the encyclopedia as ontology)
2. order learning	Assimilation	Support of goal oriented practice (project work etc.)	Gamelevels (folksonomy, Wikipedia)
3. order learning	Accommodation	Support of question oriented practice (focus on basic assumptions)	Game structure (user based search architecture)
4. order learning	Paradigm change	The distinction between what is and what isn't yet known	Game vs. Non-game (virtuality vs. reality)

## Conclusion

### Conclusion: The Library as a Knowledge Institution

The initial hypothesis of this article was that the basic function of a modern library is not to provide access to as much information as possible, but to provide knowledge management services. The basic function is to help the citizen with managing information overload.

Consequently, we must understand what "knowledge" is in the so-called knowledge Society. Thus, the brief conclusion of the above is that in order to establish and organize a modern library we must know what knowledge is, in which forms it appears, and how the different forms of knowledge are best facilitated. In this article the basic principles and categories of such a theory have been suggested.

**Thank you**

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