



**HTW** Chur  
Hochschule für Technik und Wirtschaft

Fachhochschule Ostschweiz  
University of Applied Sciences



KWIL 2007

# Collaborative Design of Ontologies: Theory, Opportunities and convenient Applications

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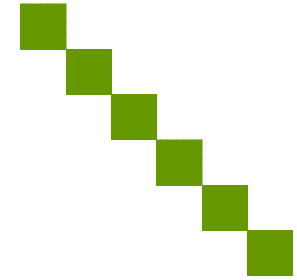


**Lydia Bauer**

*"I never teach my pupils;  
I only attempt to provide the conditions  
in which they can learn."*

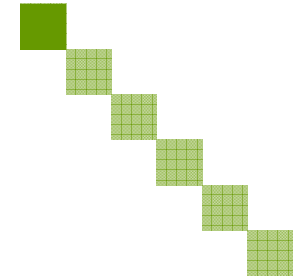
Albert Einstein (1879 - 1955)

# AGENDA



1. Context: Our eLiterate Society
2. Key Qualifications
3. Comprehensive Blended Learning
4. Creating a Knowledge Order
5. Collaborative Creation of a Topic Map
6. Conclusion

# 1. Context: Our eLiterate Society



## **Today's information society**

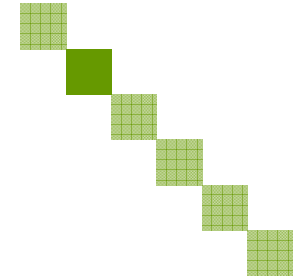
- teamwork and networking
- knowledge exchange
- technologies and media
- collaboration (Web2.0)

→ key competencies are crucial in our society

→ thus, they need to be actively taught and developed in academic education

## 2. Key qualifications

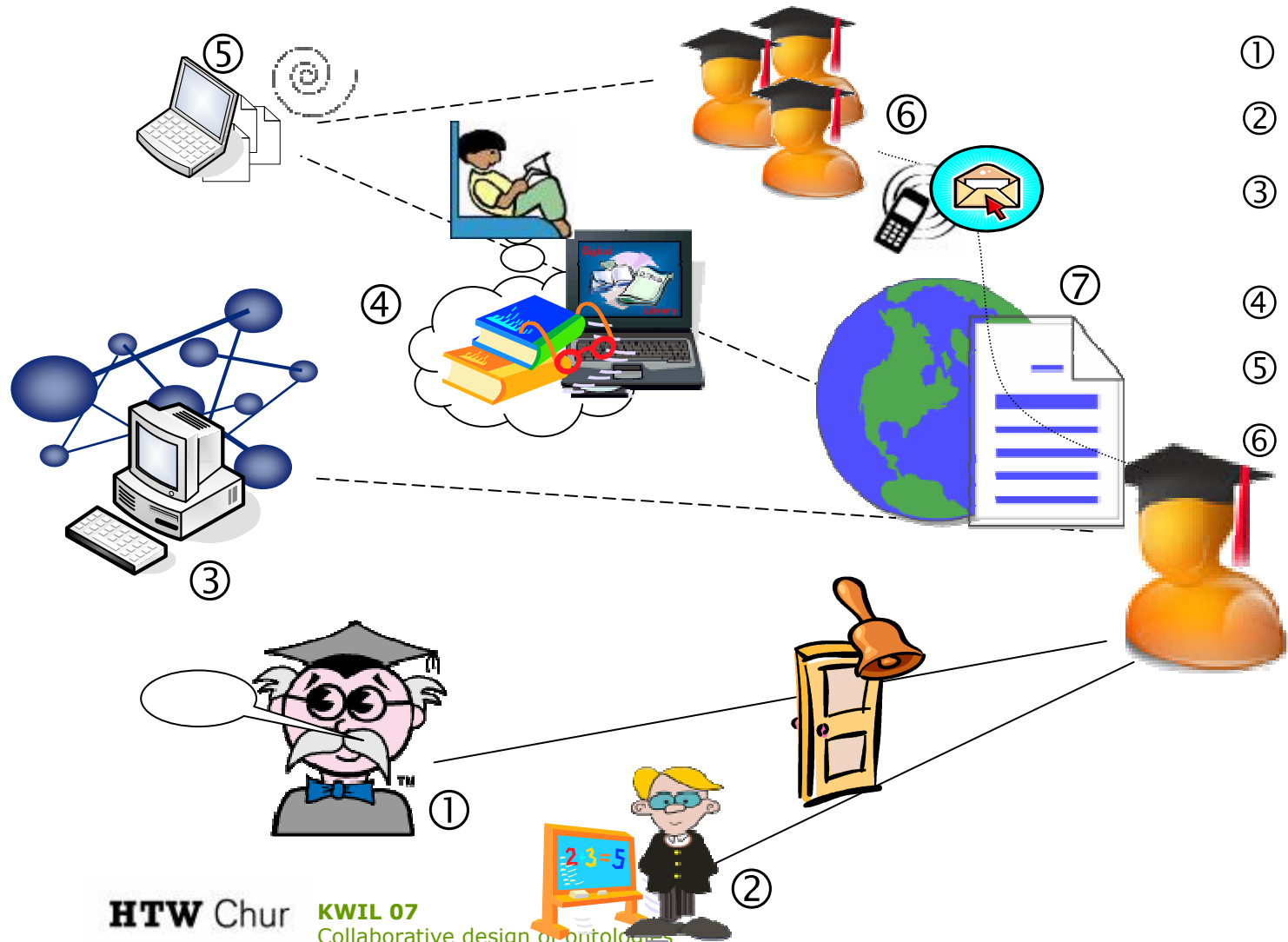
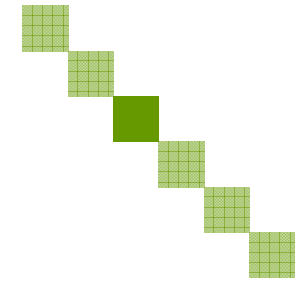
### Information and media competence



### **The relevance of teaching information and media competence**

- technological advances
  - increase in the range of data and information overload
  - changes in the provision of information
- 
- globalisation and modernisation of our society as the reasons behind a networked world
  - development of new challenges for individuals in terms of dealing with information

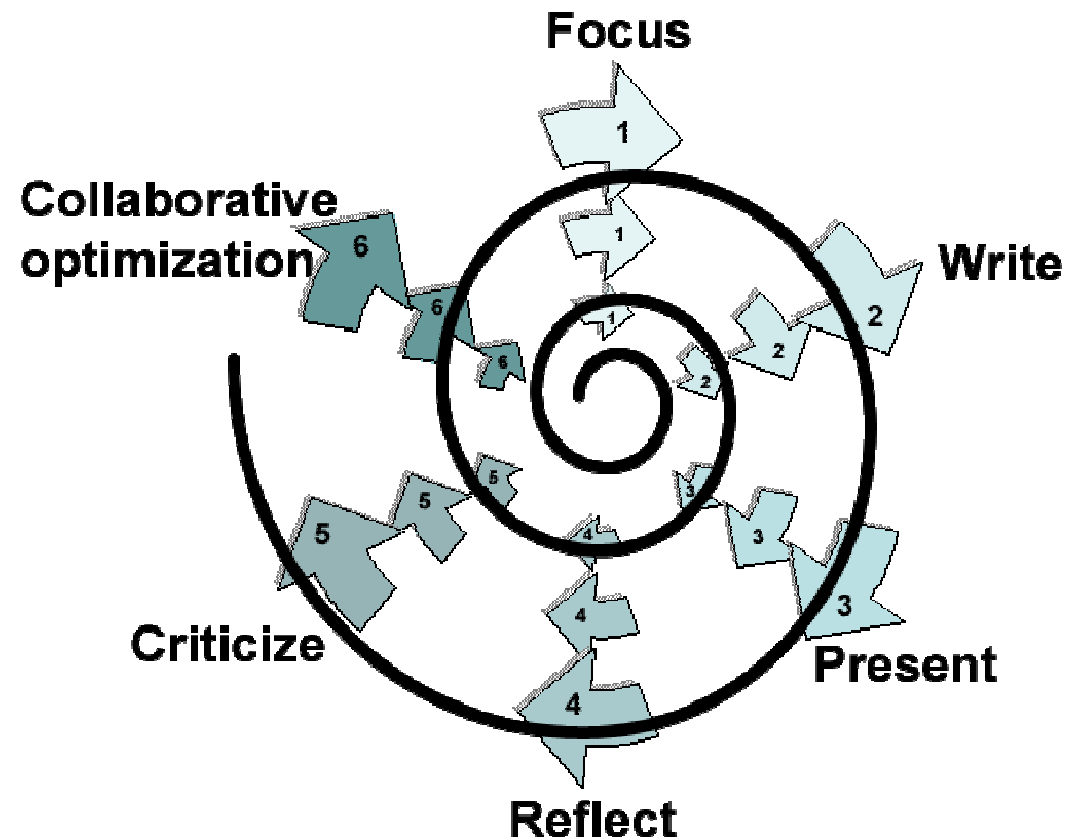
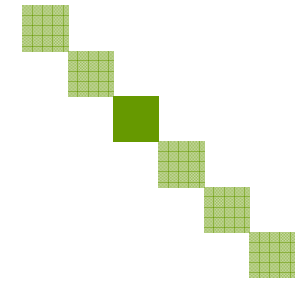
# 3. Comprehensive Blended Learning



- ① Traditional Lecture
- ② Accompanying Tutorial
- ③ eLearning Website, Topic Maps
- ④ Literature Assignments
- ⑤ Collaborative Writing
- ⑥ Peer2Peer Learning & Communication
- ⑦ eLearning Platform

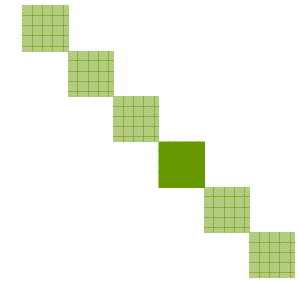
# 3. Comprehensive Blended Learning

## Knowledge-enhancing helix



# 4. Creating a Knowledge Order

From educational funnels to educational webs



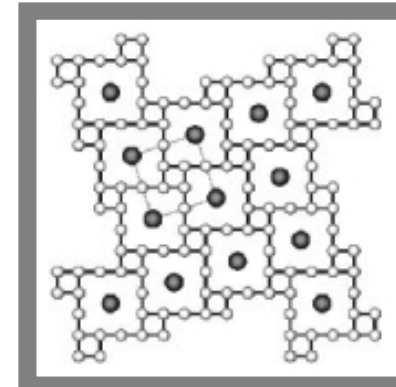
*traditional*



**educational funnels**



*modern*

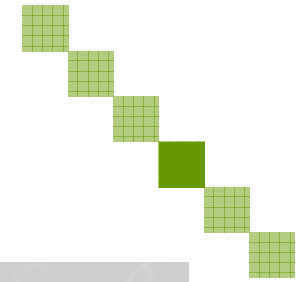


**educational webs**

[Illich, I. (1970)]

# 4. Creating a Knowledge Order

## Theoretical assumptions



### **Neuropsychology** [Müller&Schwärzel 2005, Thissen 1997]

- learning as an active process of knowledge construction
- active participation of learners in the knowledge acquisition process learning

### **Contextual Teaching and Learning** [Clemente 2007]

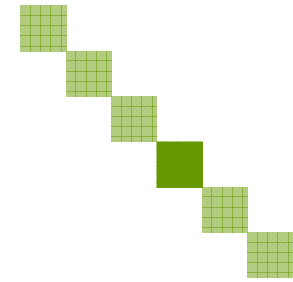
- new contents are embedded in a concrete context with which the students are already familiar
- new knowledge is actively constructed by the students
- learning becomes an active process conducted by students guided by instruction

### **Elaboration Theory** [Reigeluth 2000]

- classification and sequencing of the selected learning contents
- structuring and subdivision of knowledge contents into knowledge building blocks

## 4. Creating a Knowledge Order

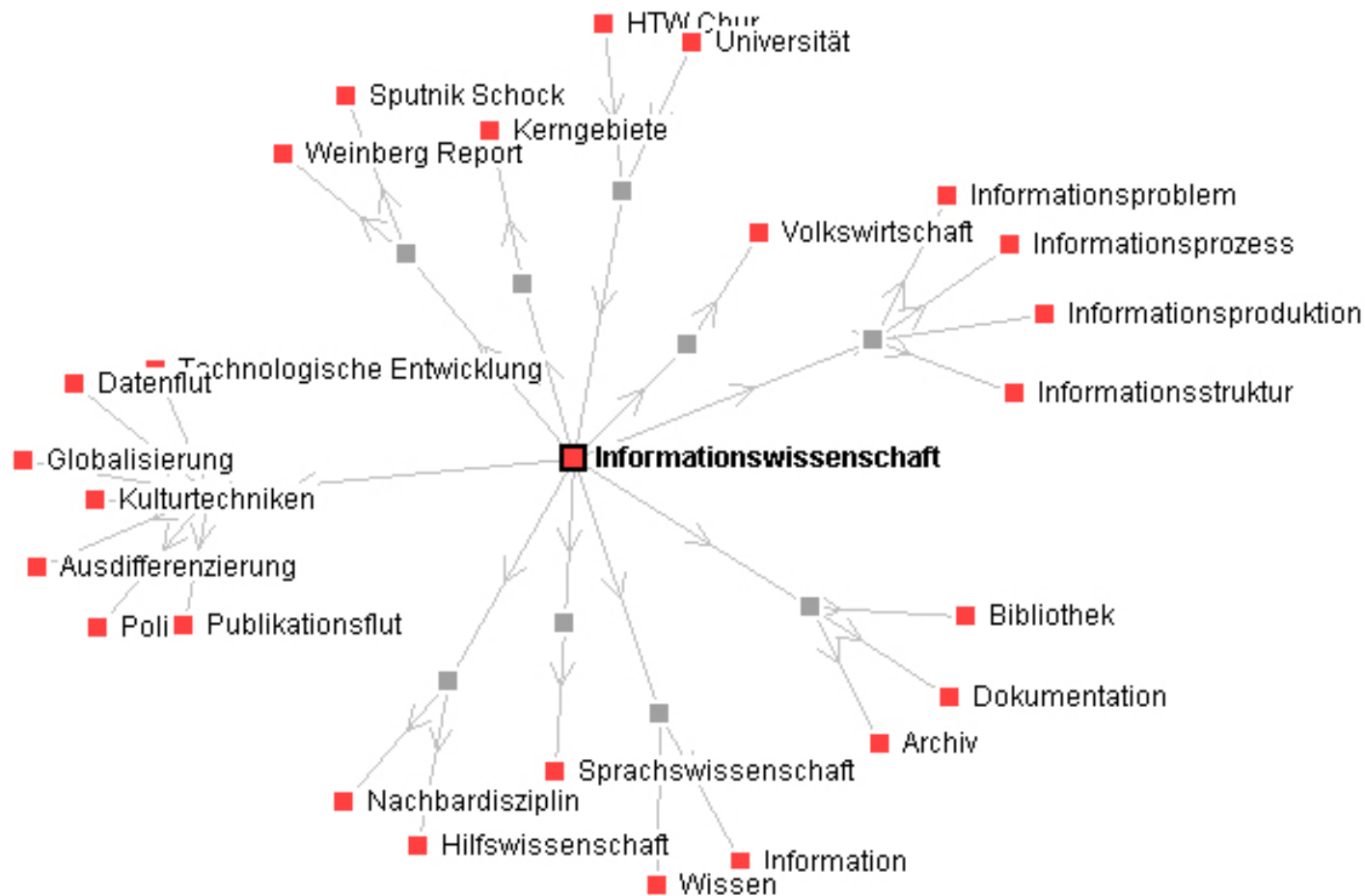
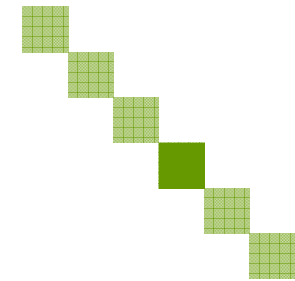
### Topic Maps



- allow ontologies to be represented visually
  - qualify and explain the relationships between individual building blocks
  - allow the reuse of learning objects that already exist in a semantic form
- basis for a lecture or a blended learning course
- allow learners access to learning materials that is thematical and multi-relational

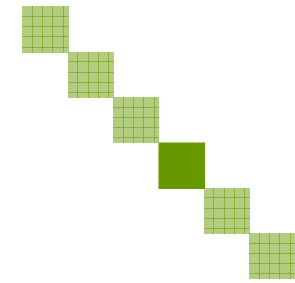
# 4. Creating a Knowledge Order

## Example of a topic map



## 4. Creating a Knowledge Order

Creation process as a learning process

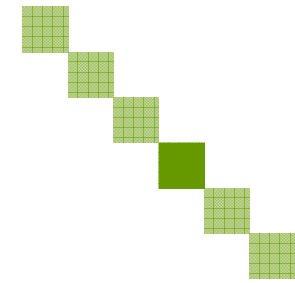


### When building a topic map students learn how to

- explicate implicit knowledge
- identify individual knowledge building blocks
- recognise the associations between different subject areas
- define concepts within an application or thematic context
- embed the acquired and newly learned knowledge in an overall context
- exchange and discuss in a team with the aim of achieving collective sense-making

## 4. Creating a Knowledge Order

Result of the creation process

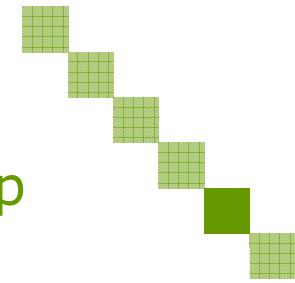


### **The resulting topic map can be used**

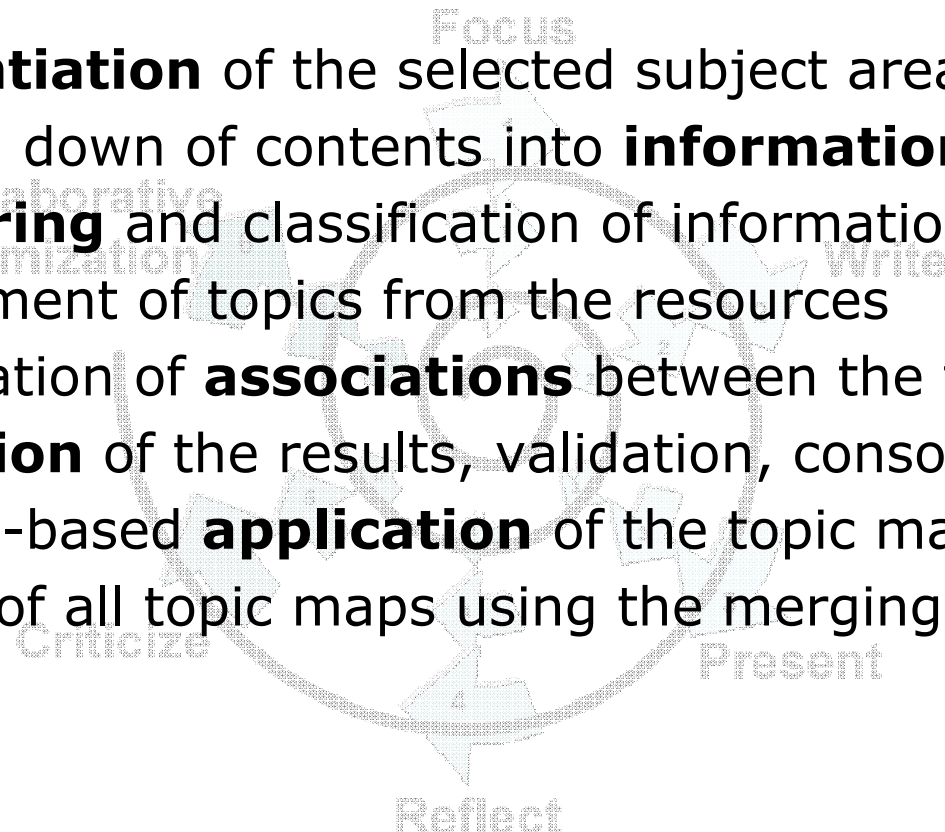
- as a non-hierarchical method of accessing course materials
- to create an overview and differentiation of the topics taught
- as a cross-linked representation of contents that embeds new aspects
- as reference material that defines terms in the contexts

# 5. Collaborative Creation of a Topic Map

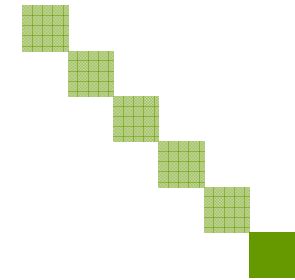
Relevant steps for collaboratively designing a topic map



1. **differentiation** of the selected subject area
2. breaking down of contents into **information chunks**
3. **structuring** and classification of information chunks
4. development of topics from the resources
5. identification of **associations** between the topics
6. **discussion** of the results, validation, consolidation
7. software-based **application** of the topic map draft
8. **linking** of all topic maps using the merging principle



## 6. Conclusion



The topic map helps the learner

- to associate new contents better with pre-existing knowledge
- how to systematically undertake and document his learning preparations and the repetition of lecture contents

The collaborative designing process serves as

- a learning tool from which students profit as a result of the active acquisition and expansion of their knowledge
- a basis for an active and comprehensive teaching of information and media competencies and other key competencies

→ *Extending these learning methods to higher semesters or rather to masters' courses is strongly recommended because collective viewpoints and reflections are just as helpful here in associating knowledge that has already been learned with new contents.*

*"I cannot teach anybody anything,  
I can only make them think"*

Socrates (469 BC - 399 BC)



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**Thank you very much for  
your attention!**

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