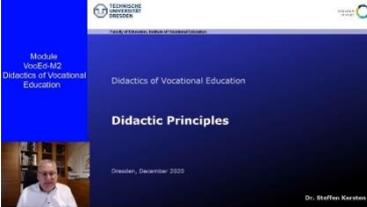


Didactics of Vocational Education

# Didactic Principles

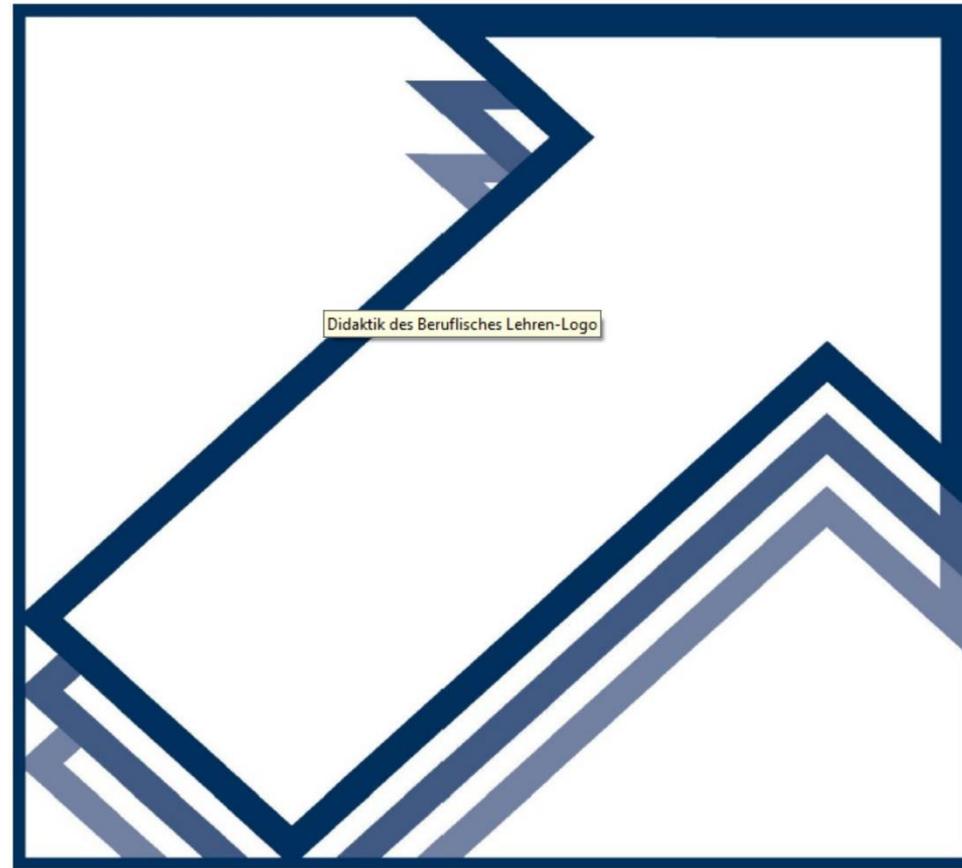
Dresden/Beijing, March 2022

**Prof. Dr. Steffen Kersten**

Video-Lecture	Relevant sections in the study material	Exercises	Relevant exam tasks
 <p>Demand-oriented VocEd (63 min)</p>		<ul style="list-style-type: none"> <li>- What is the meaning of the terms “holistic act” and “complete act”?</li> </ul>	<ul style="list-style-type: none"> <li>- Describe and explain the simplified model of education!</li> <li>- What significance has the "compensation act" in this model?</li> </ul>
 <p>Didactic principles (61 min)</p>	Chapter 4 p. 24 - 33	<ul style="list-style-type: none"> <li>- Develop own examples for the three ways of didactic simplification!</li> <li>- What requirements are to consider in the process of simplification?</li> </ul>	<ul style="list-style-type: none"> <li>- Explain your suggestions about the term „Didactic Principle“!</li> <li>- Which issues or criteria of Didactic Principles are generally closed related to an entire teaching performance to proceed to suitable and successful learning outcomes of the students?</li> <li>- Point out the main impact of the Didactic Principle of illustration. Express your understanding about the role of this principle to build up an expedient learning performance.</li> <li>- Explain significant importance of the didactic principle of comprehensibility by your own words! Explain the three ways of didactic simplification with help of own examples!</li> </ul>
 <p>Didactic-methodical design elements (54 min)</p>	Chapter 5 p. 35 and p. 64	<ul style="list-style-type: none"> <li>- Collect all the teaching and learning methods that you know in an individual brainstorming session!</li> </ul>	<ul style="list-style-type: none"> <li>- Explain the didactic-methodical design elements for the organization and structuring of the learning processes!</li> </ul>

Didactics of Vocational Education and Training

(p. 24 - 33)



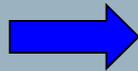
Study Material

Dresden/Beijing 2022

## Theory

- describes, explains and prognoses

**System of assured statements**



**laws**

## Method

- directs and regulates human thought and action

**System of rules, principles, advices**

## **PRINCIPLE**

## **latin**

## **leading basic idea**

- Principles for lesson design, beads on laws or coherences almost like laws or systematised experiences
- Presents/opens up space for thoughts and action for the teacher
- is valid for all forms/types of vocational lessons/learning/ instruction
- depicts coherence of arguments in the design of vocational lessons/learning/ instruction (descriptive function)
- have an effect on orientation, performing of tasks and evaluation of results/outcomes without determining them (regulative function)

## **Descriptive Funktion → Theoretical**

Didactic functions describe explanatory contexts in Design of professional instruction.

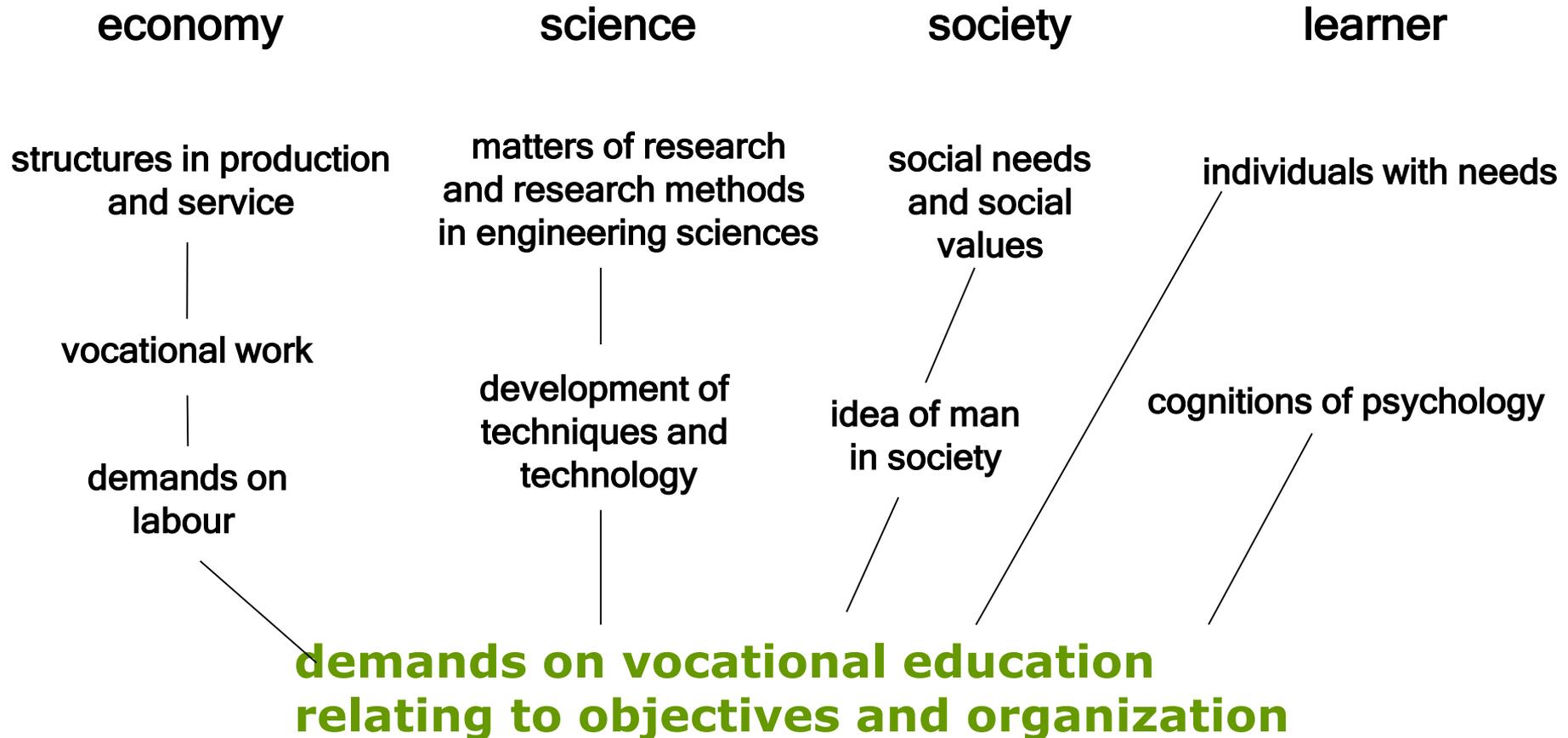
## **Regulative Funktion → Methodological**

Didactic functions act regulative on orientation, execution and control of teacher acts

## **Didactic Rules**

- special regulative indications, which go into detail on the implementation and correct application of the didactic principles
- refer to concrete situations

## Influence factors of vocational education



**Work process reference**



**Academic approach**



**Methodology and  
systematology**



**Education effectiveness**



**Comprehensibility**

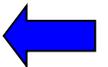
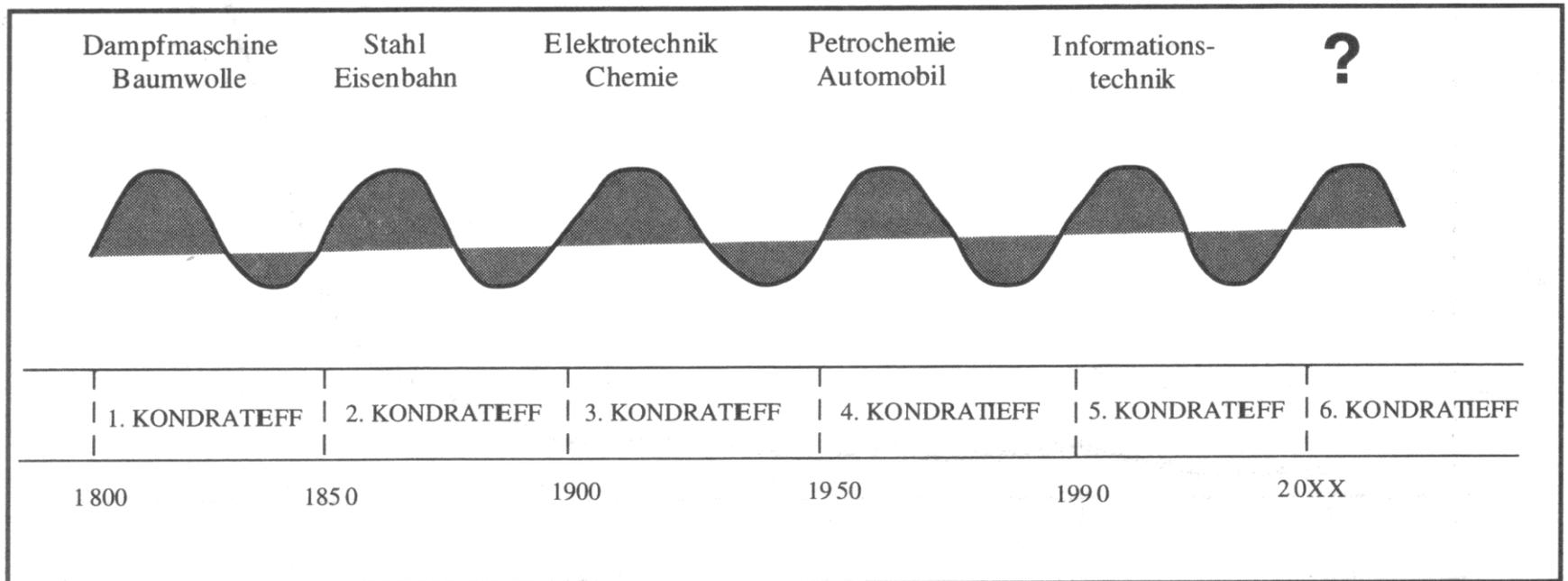


**Clearness/Illustration**



**Activity and autonomy**

# Theory of long waves in the economy according to Kondratieff



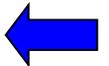
## **nonage**

is the inability to use of the own understanding  
without direction from another person. (I. Kant)

## **From the convenience to be nonage**

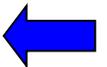
„Enlightenment is man's emergence from his self-incurred nonage...“

Immanuel Kant 1784



**Academic approach of teaching is,**  
to teach objectively truth in his system for the acquisition of  
the vocation.

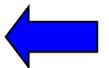
**Academic approach of teaching** requires  
to develop methods and techniques of his professional  
field and of learning



**Methodology of teaching** means to teach purposefully on the basis of curricula and other instructions as well as orders.

.

**Systematology of teaching** means to arrange the particular academically proven considering methodology in an entirety.



**Teaching in a comprehensible way** means to design learning conditions for the students, that they can acquire the learning objects with reasonable effort.

Developmental Psychological Justification →

Motivation Psychological Justification →

Didactic consequences →

## Theory of intellectual development according to **PIAGET**

Mental development takes place in a balanced ratio of assimilation and accommodation.

In the process of **assimilation** external instructions be brought in accordance with the internal structures

The mental **accomodation** is the opposite movement towards assimilation. It consists in the variation of the individual and its inner structure by reality.

(vgl. Furth, H.G.: Piaget für Lehrer.- Düsseldorf 1973, S.29)

## Assimilation

Admission of new experiences



If necessary, modification of the new experience, for consistency with its own knowledge structure



Contradiction-free integration of new experiences in the own knowledge structure  
(Act schemes)

## Accomodation

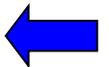
Admission of new experiences



Changing the internal structure, for consistency with the new experiences

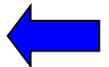
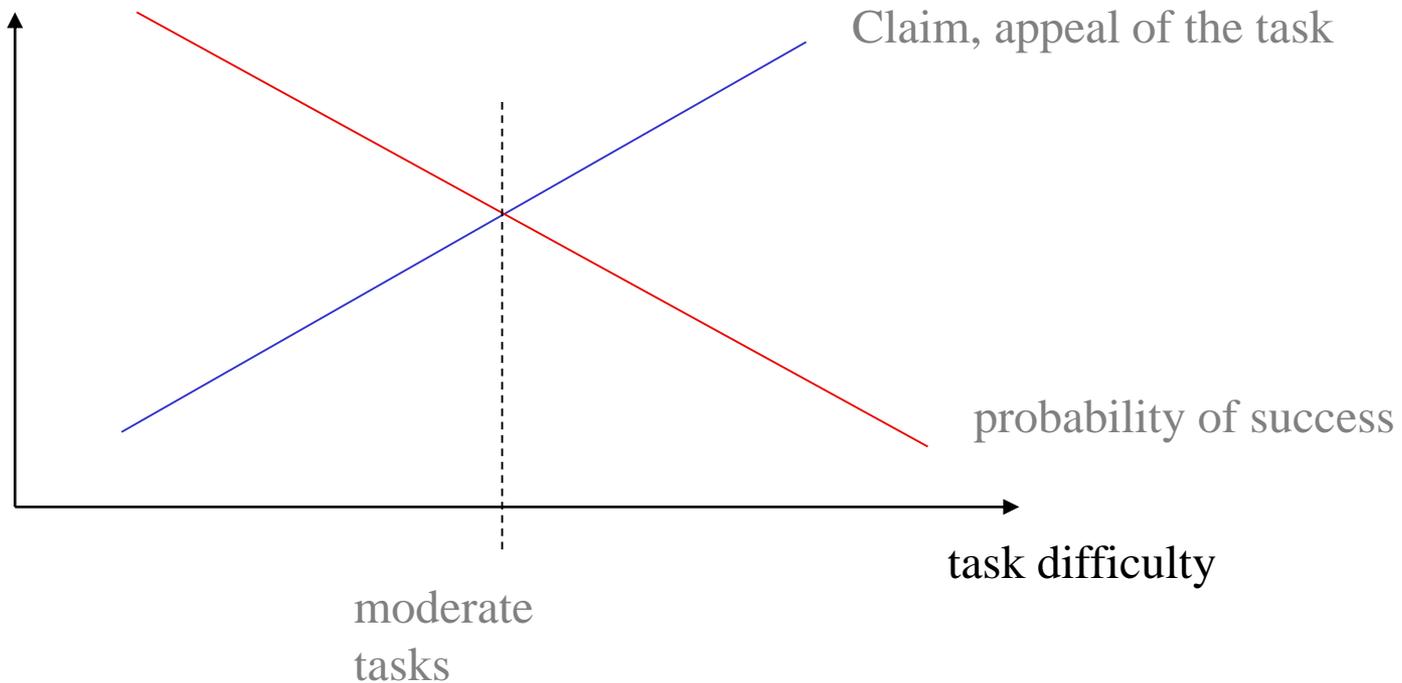


Contradiction-free integration of new experiences in the own knowledge structure  
(Act schemes)



## Theory of achievement motivation by **ATKINSON** (Risk choice model)

Achievement motivation



## Didactic rules of the principle of comprehensibility

Move

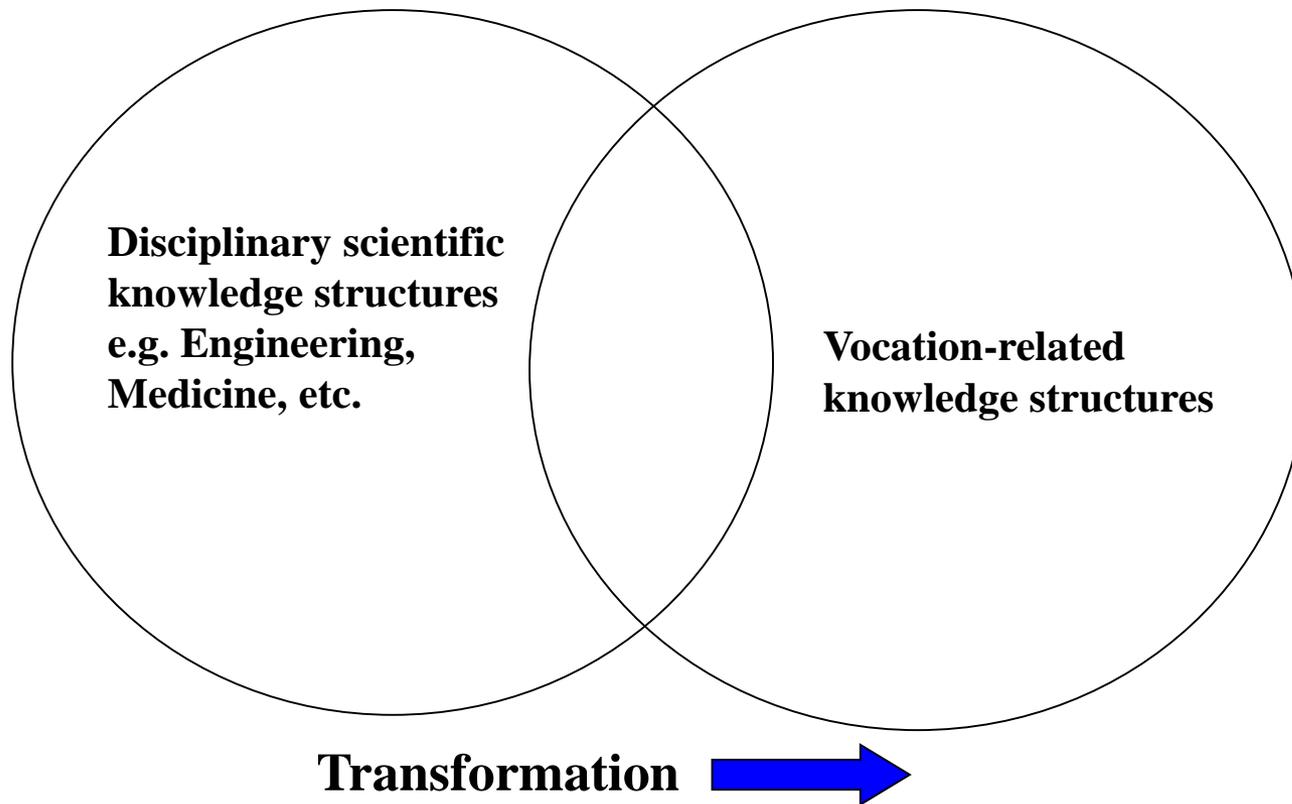
from Known            to            Unknown

from Simple            to            more Complicated

from Near            to            more Remote

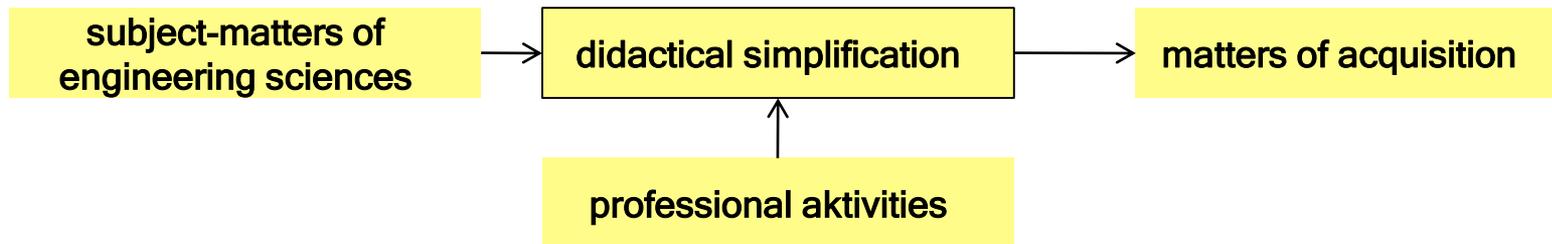
from Easy            to            more Difficult

## Didactic Simplification



Which subject-matters of engineering sciences are useful as appropriate matters of acquisition for the respective professions?

→ relation to subject-matters of engineering sciences



System of scientific statements of engineering sciences with professional relation  
(Theories, laws, hypotheses ...)

System of professional scientific act regulatives  
(Principles, methods, rules, procedures)

System of professional scientific act standards  
(Directives, standards)

## **Didactic Simplification according to HERING**

Didactic simplification of a scientific statement is the transition of a *differentiated* term or statement (including special characteristics of the object) into a *universal* term or statement (including validity to the same extent about the same object seen from the same aspect)

(Hering, D.: Zur Faßlichkeit naturwissenschaftlicher und technischer Aussagen. Berlin 1959, S.92)

### **Criterion for the legitimacy of didactic simplification**

- Academic approach must be preserved
- Transition must be possible without contradictions (no unlearning/relearning – recently learned matters must be compatible with matters learned a longer time ago)

## Ways of didactic simplification

### Redemption (elimination) of secondary statements – Example 1

In the stomach, proteins are denatured by the hydrochloric acid (Denaturation means complete loss of structure), and the inactive Pepsinogen is activated to pepsin. The latter splits about 10% of the proteins in smaller polypeptide chains that are now resorbable.

#### *Simplification:*

In the stomach, part of the proteins by chemical processes into smaller Particles decomposed, which can now be absorbed into the blood.

→ **Generic Term**

## Ways of didactic simplification

### Redemption (elimination) of secondary statements– Example 2

In psychology, the observation, the experiment, the test and the survey are scientific procedures to to win data about an object of research.

#### *Simplification:*

In psychology there are different scientific methods of data collection.

→ **Generic Term**

## Ways of didactic simplification

### Redemption (elimination) of secondary statements– Example 3

Electrical conductivity is possible through electrons, ions, or p-holes.

#### *Simplification:*

Electrical conductivity is possible through moving charge carriers.

→ **Generic Term**

## Ways of didactic simplification

### Indicative redemption (elimination) of secondary aspects/ Partial statements – Example 1

Causes for the development of liver cirrhosis can be a chronic course of hepatitis B or hepatitis C virus infection, autoimmune hepatitis, congenital metabolic diseases (Wilson's disease, pigment cirrhosis), biliary disease or toxic injury by ethyl alcohol.

#### *Simplification:*

Among the many possible causes for the development of liver cirrhosis, toxic damage from alcohol in Germany is most common.

**Essential sub statements are singled out and pointed to the existence of the another parts of statements.**

## Ways of didactic simplification

### **Indicative redemption (elimination) of secondary aspects/ Partial statements – Example 2**

In the social pedagogical practice, a distinction the methods of the social community work, social group work and individual social casework

#### *Simplification*

The individual social case work represents an important method of social pedagogical practice.

**Essential sub statements are singled out and pointed to the existence of the another parts of statements.**

## Ways of didactic simplification

### Indicative redemption (elimination) of secondary aspects/ Partial statements – Example 3

Electrical conductivity is possible through electrons, ions, or p-holes.

#### *Simplification*

Electrical conductivity is caused by electrons in the most cases.  
There are other charge carriers.

**Essential sub statements are singled out and pointed to the existence of the another parts of statements.**

## Ways of didactic simplification

### Indicative Generalisation– Example 1

Speed is the differential of the path over the time  $V = \frac{ds}{dt}$

#### *Vereinfachung:*

Speed is the ratio of distance and time.  
(with uniform movement)  $V = \frac{s}{t}$

### Transition to a simplified statement with reference to restrictive features

## **Indicative Generalisation– Example 2**

### *Simplification:*

Veins carry deoxygenated blood to the heart, that is true only in the body circulation.

(Not in the lung circulation)

**Transition to a simplified statement with reference to restrictive features**

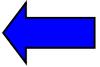
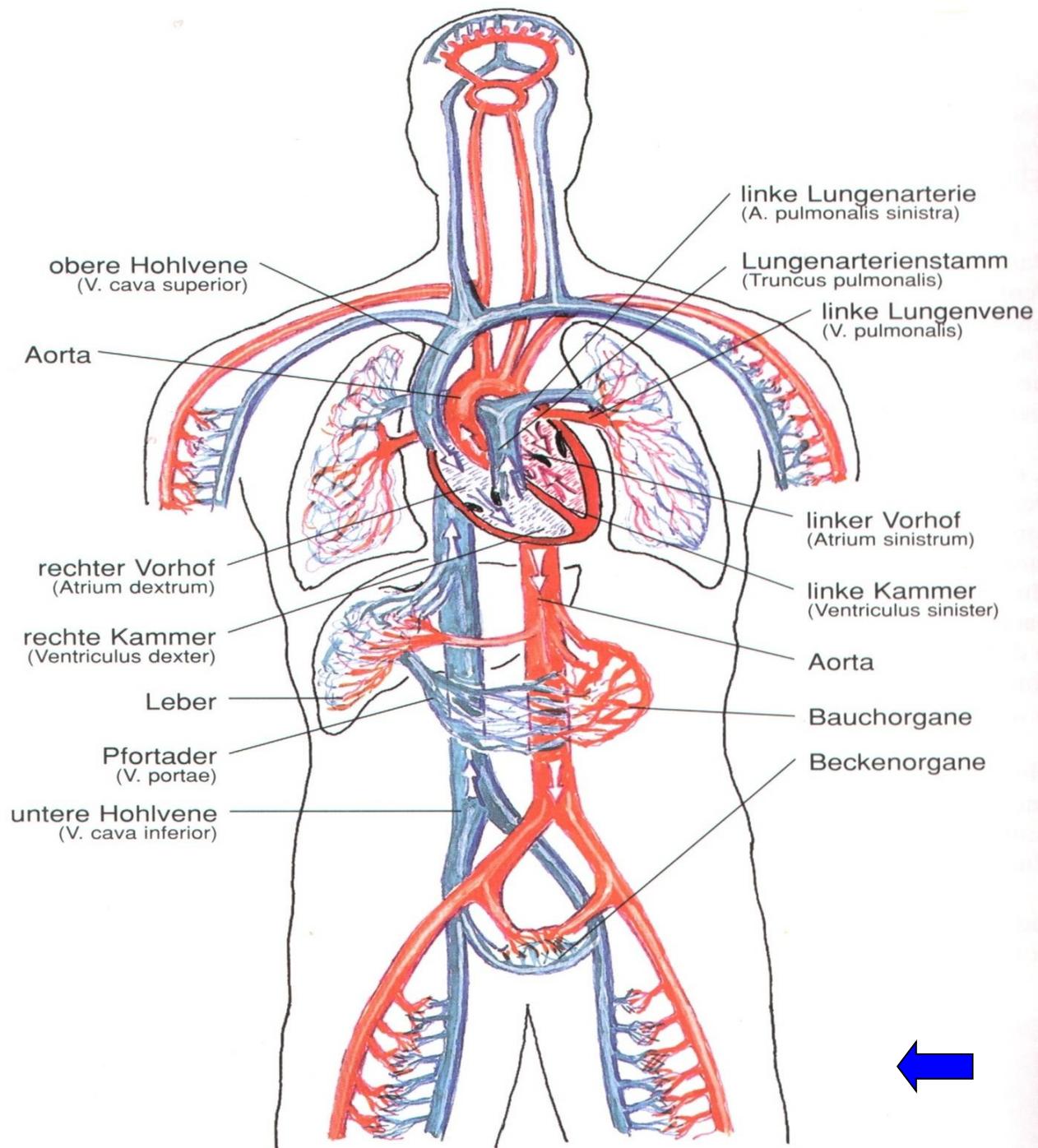
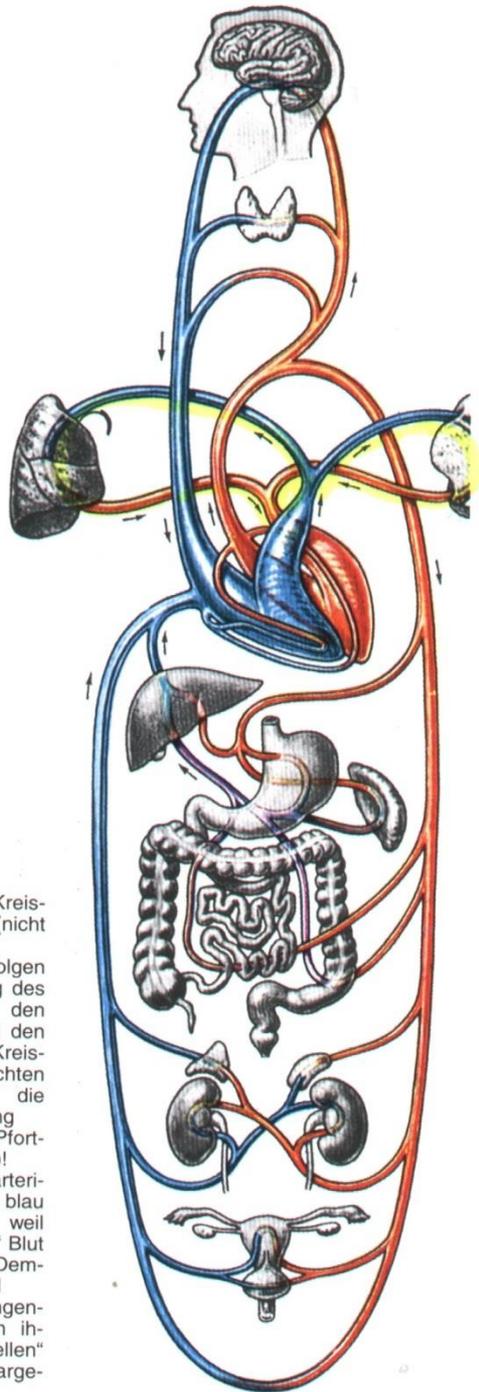


Abb. 142. Kreislaufschema (nicht maßstabgerecht). Verfolgen Sie den Weg des Blutes durch den „kleinen“ und den „großen“ Kreislauf! Beachten Sie dabei die Sonderstellung der Leber (Pfortaderkreislauf)! Die Lungenarterien sind hier blau gezeichnet, weil sie „venöses“ Blut enthalten. Dementsprechend sind die Lungenvenen wegen ihres „arteriellen“ Blutes rot dargestellt. [sb3]

The didactic principle of clarity is directed on the conscious design of perceptual processes in the classroom.

**Clearness is a property of subjective images, which as a result of Perceptual processes arise, if**

- The matter of acquisition has pictorial character
- The matter of acquisition allows connotations to matters already learned
- The linguistic elements already known to the learner

## Illustration/Visualisation in Process of Acquisition

by

Graphic matter of acquisition

- self-dependently experienced reality
- demonstrated reality

Non concrete matter of acquisition

- models
- figurative depiction
- schemes

Representational-abstract Matter of acquisition

- oral description of matters of acquisition
- written description of matters of acquisition



Level of Abstraction

**Exercise: group work max. 3 members 45 min**

**Find for each method of didactic simplification an example from your subject!**

Thank you for your attention!

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<https://wwwpub.zih.tu-dresden.de/~kersten>