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Learning Structure Grid

An approach to diagnosing and organising differentiated lessons

Guidelines for use

The challenges posed in particular by integration and inclusion, as well as the legal entitlement to individualised support - at least in the North Rhine-Westphalia / Germany School Act - lead to changes in the reality of teaching and therefore also have consequences for teacher training. This applies in principle to all countries involved in this Erasmus project.

All institutions involved in the training of prospective vocational school teachers must make a significant contribution if they are to be well-equipped to take on the demanding tasks after their training. In order to fulfil this task, intensive cooperation between all training partners is required.

In order for teachers to be able to fulfil the challenging task of successfully teaching in heterogeneous learning groups, the following skills are required in particular:

- Teachers diagnose the learning requirements of their students and derive suitable actions and strategies for their lessons from these findings.
- They recognise personal and systemic disadvantages of their students and are able to reduce them.

As part of the project, we decided to leave the selection of a scientific and theory-based approach to the prospective teachers themselves in the spirit of research-based learning. On the basis of this selected approach, we then wanted them to develop their own construction for diagnosis and individual support, optimised for everyday professional life.

At this point, the prospective teachers have decided in favour of using the model from Wember. This differentiation model assumes that all learners work on the same or similar learning situations. It enables both equal and differentiated work. Another basic idea is that different competency expectations arise on the basis of the students' individual learning requirements. This first requires a solid assessment of the current competence level of the students as a basis for subsequent differentiation.

The diamond represents the students in a learning group. The majority of learners are in the basic level. They fulfil the competence expectations of the curricula and do not require any special support. Support is required for students who perform at the upper and lower end of the competency expectations set out in the curricula.

The following illustration shows an exemplary interpretation of this approach: on the left-hand side to categorise the learning requirements of the students in a learning group, on the right-hand side to document the necessary individual support.

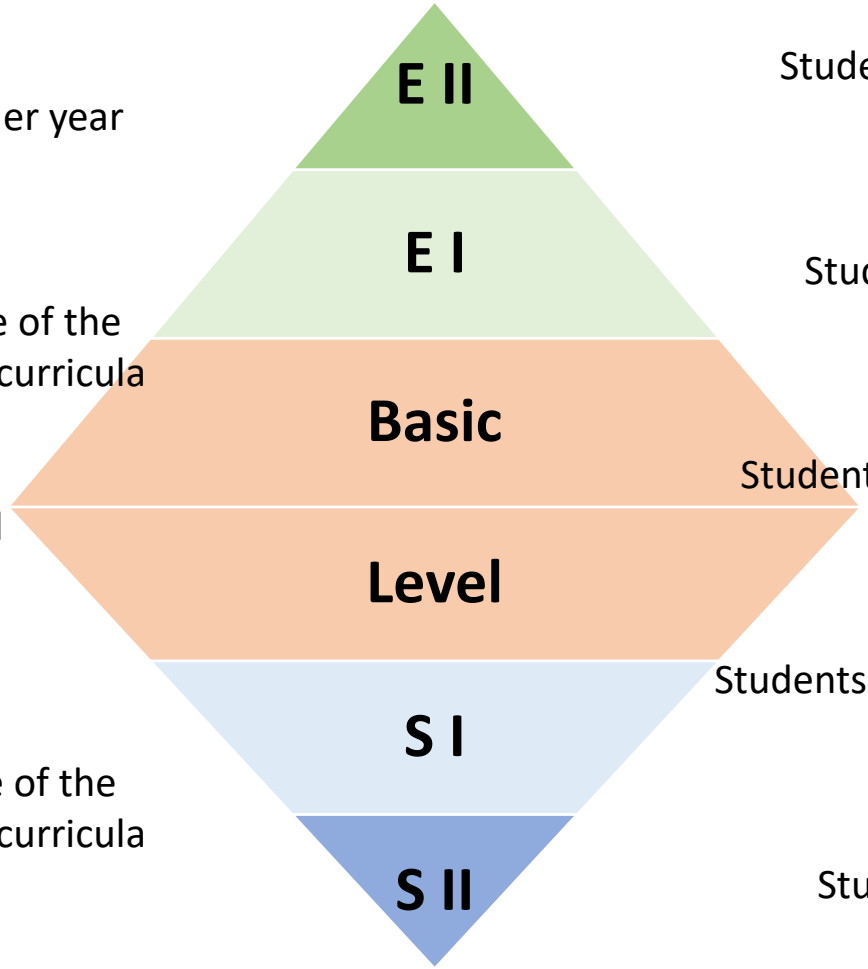
Extension Level II:
Students learn in the area of the competence expectations of higher year groups

Extension Level I:
Students learn in the upper range of the competence expectations of the curricula

Basic Level:
Students learn within the general competence expectations of the curricula

Support Level I:
Students learn in the lower range of the competence expectations of the curricula

Support Level II:
Students learn with significantly lower competence expectations



Extension Level II:
Students receive significantly more challenging / possibly additional learning tasks

Extension Level I:
Students receive significantly more challenging learning tasks

Basic Level:
Students generally do not need individualised help and use learning aids independently

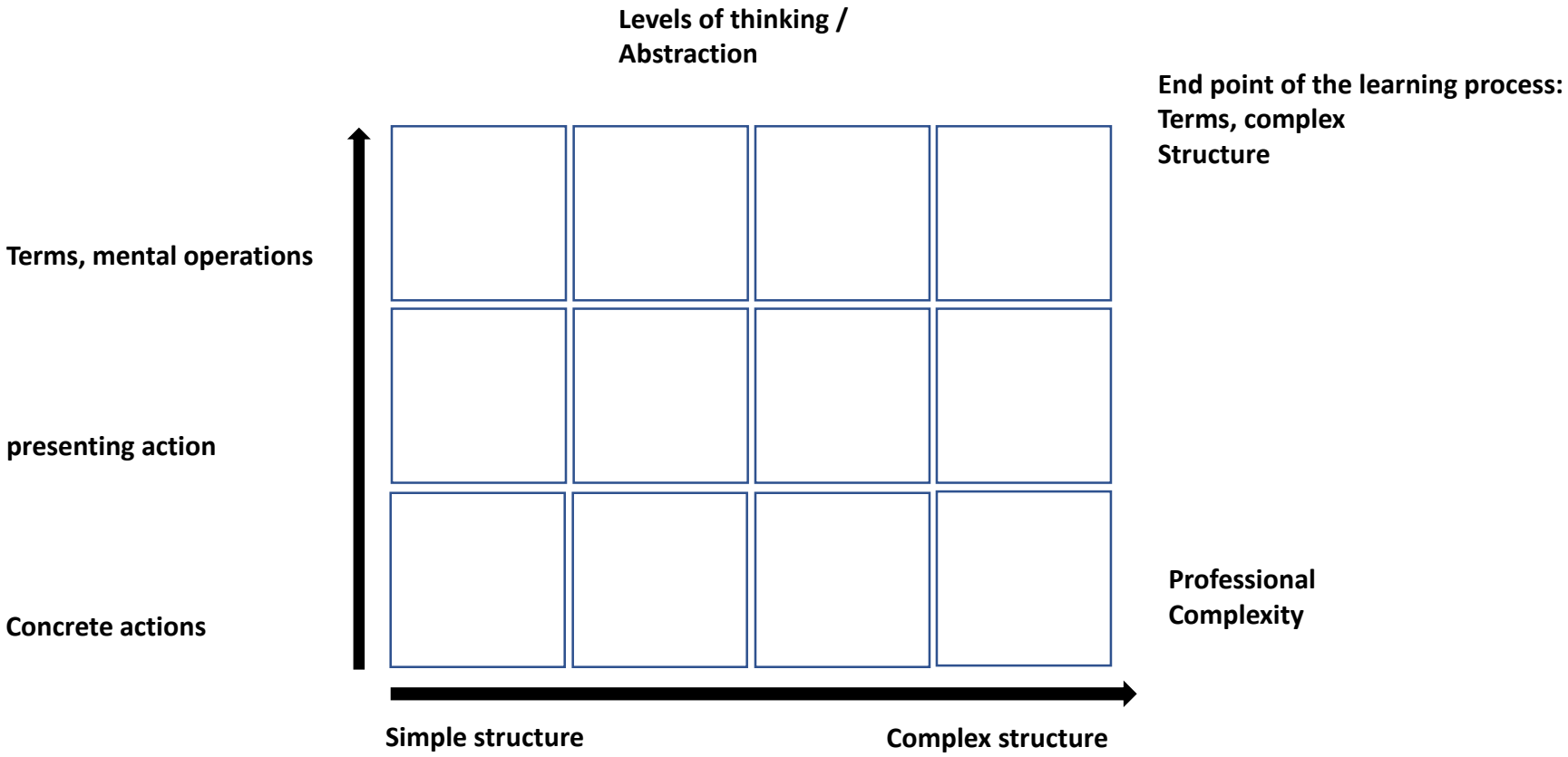
Support Level I:
Students receive additional support (e.g. adaptation of media, additional aids, etc.)

Support Level II:
Students work with individually modified aids, additional individual support

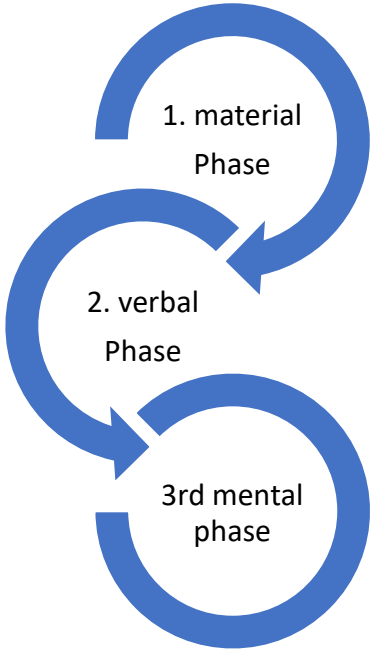
In practice, the categorisation of students in a class could look like this, for example:

	The pupil can...	Jassim	Vein	Justin	Fadwa	Hanaa	Ahmad	Ruhulla	Anjelina	Marie	Elmin	Sara	Sheefa	Armin	Salvo	Anilcan	Sumaya	Jawad	Kiara	Koray
Development area: Transferability	Cognitively link perceptual elements of the new learning situation with previously learnt content																			
	recognise familiar structures and recall them with the help of support material.																			
	transfer what they have learnt appropriately to new learning situations in structured contexts, if necessary with supportive impulses (e.g. illustrative material)																			
Specialised	Formulate texts correctly according to form and structure																			
	independently form sentence constructions (series, main/subordinate clauses)																			
	Observe the margin and lines of the worksheet as the correct size																			

For the practical use of this approach in everyday school life, the documentation of both the diagnosis and the support measures in a matrix has proven to be helpful. The following example shows the transfer into a learning structure grid, which in this example takes into account the subject-related complexity and, on the y-axis, the cognitive complexity in the learning process (cf. the learning structure grid according to Kutzer in QUA-LIS NRW, 2023).



During the analysis of videotaped lessons, the limited language skills of many pupils were recognised as a significant factor for learning difficulties.
Based on the basic assumption that verbalisation is of paramount importance in the learning process and for complete internalisation, our model takes particular account of language skills on the y-axis in addition to cognitive abilities.
We start from the basic assumption that a comprehensive promotion of professional competence can only be achieved in the context of an increase in linguistic competence.



Stages of skills acquisition according to Coyle, D and Meyer, O. (2021), p. 49

Below you will find an explanation of the learning structure grid developed on this model and instructions on how to use it.

Structure of the learning structure grid

	Learning structure grid (based on Wember, Kutzer and Polias)				
	Class:		Topic:		
Creating/ Problem Solving [Language] - Students design solutions to problem-oriented issues in a creative form. Students: explore, hypothesise, predict, simulate, take other perspectives, redesign					
Evaluate [Language] - Students discuss and evaluate different issues independently. Students: define, identify, characterise, argue, take a stand, review assess, question, reflect transfer			It is an advantage/disadvantage that Press 1/2 behaves in this way because....	It is an advantage/disadvantage that press 1 behaves this way and press 2 behaves that way.	
Analyse [technical language] - Students systematically and purposefully investigate and evaluate facts. Students: express cause, express effect, draw conclusions, criticise, deduce, transfer		The double-acting cylinder behaves... because... The single-acting cylinder behaves... because...	Press 1/2 can be operated in this way because...	Press 1 behaves in this way because... Press 2 behaves in this way because...	
Apply [relate] - Students apply information/knowledge/skills to specific issues. Students: classify, compare, match, contextualise, categorise, assign, justify	The cylinder extends more slowly than it retracts.	The double-acting cylinder behaves... The single-acting cylinder behaves...	A button is pressed and triggers the following action by... This happens because...	Two buttons are pressed and trigger the following action by... This happens because...	
Comprehension [expressing in own words] - Students describe and structure issues Students: describe, mark, characterise, specify, elaborate, categorise, structure, explain, explain, find examples		A 5/2 way valve has 5 connections and 2 switching positions	A button is pressed and triggers the following action by...	Two buttons are pressed and trigger the following action by...	
Remembering [everyday language] - Students report on facts on the basis of general knowledge. Students: reproduce, report, know, enumerate, name, retell	What is a valve?	->	A button is pressed and triggers the following action...		
	1. grid: Facts, objects, situations, phenomena	*2. grid:* Several facts	*3. grid:* Connections, relationships, processes	*4. grid:* Several contexts	*5. grid:* Ideas, conceptions, models, regularities, rules
Main topics					

Legend of the five levels according to Wember				
Support level 2	Support level 1	Basic level	Expansion stage 1	Expansion stage 2

Structure of the learning structure grid

Explanation of the ordinate (Y-axis):

- Tiered taxonomy with exemplary operators including language level
- Increasing linguistic and cognitive abilities of the learners

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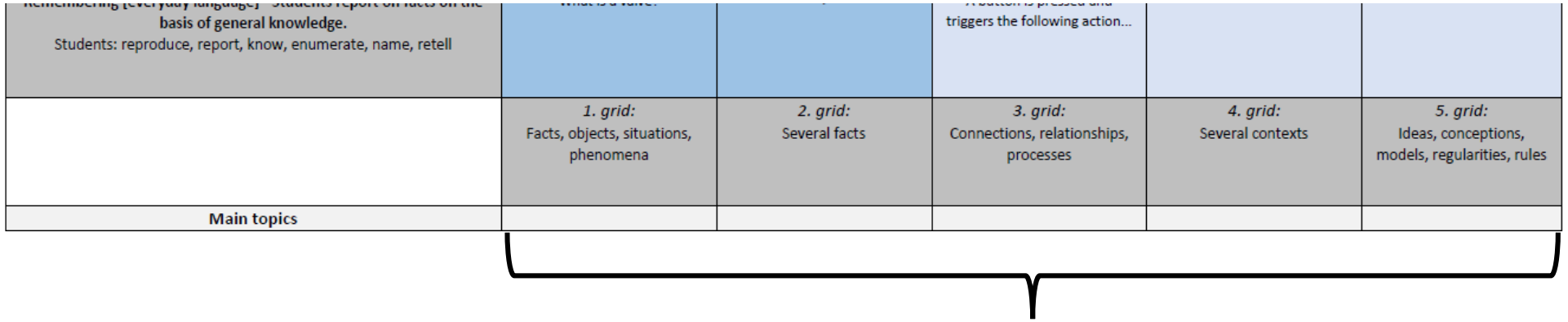

Explanation of the abscissa (X-axis):

- Increasing complexity of content from level 1 to level 5

Structure of the learning structure grid

Categorisation of requirements according to Wember

- Basic level (orange): Should be achieved by the majority of learners
- Extension levels 1 and 2 (green): Designed to support learners on higher competence levels
- Support levels 1 and 2 (blue): Designed to scaffold learners on lower competence levels with support materials to participate in lessons

		It is an advantage/disadvantage that Press 1/2 behaves in this way because....	It is an advantage/disadvantage that press 1 behaves this way and press 2 behaves that way.	
	The double-acting cylinder behaves... because... The single-acting cylinder behaves... because...	Press 1/2 can be operated in this way because...	Press 1 behaves in this way because... Press 2 behaves in this way because...	
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Legend of the five levels according to Wember				
Support level 2	Support level 1	Basic level	Expansion stage 1	Expansion stage 2

Function of the learning structure grid

The contents of the fields are determined by the teacher.

Diagnosis:

The contents of the fields represent exemplary statements that learners are able to make **before** carrying out the associated lesson.

OR

To determine the expected competence level:

The contents of the fields represent exemplary statements that learners should be able to make **after** completing the corresponding lesson.

		It is an advantage/disadvantage that Press 1/2 behaves in this way because....	It is an advantage/disadvantage that press 1 behaves this way and press 2 behaves that way.
	The double-acting cylinder behaves... because... The single-acting cylinder behaves... because...	Press 1/2 can be operated in this way because...	Press 1 behaves in this way because... Press 2 behaves in this way because...
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	->	A button is pressed and triggers the following action...	

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