

Initiating and organising student-centred learning processes in learning situations

How can I organise my lessons in such a way that students are involved and the process is visible to everyone involved?

Module 6



**Co-funded by
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Starting point 1:

In the previous module, we planned the framework for a learning situation.

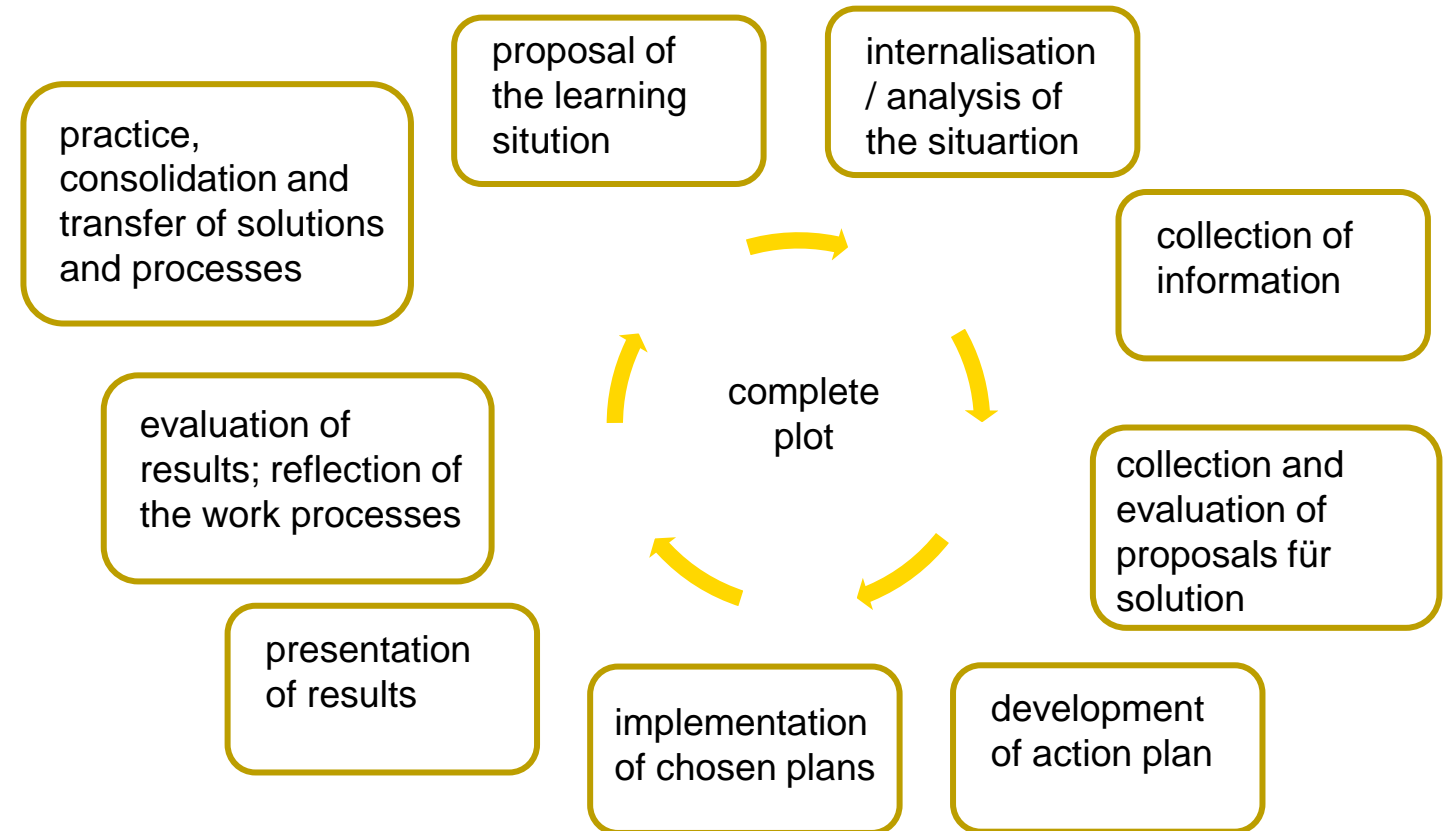
In terms of structure, we first focused on the work and business processes and, based on these, derived the competences we want to promote.



We try to reflect this structure as much as possible. However, it does not represent the final learning process.

Starting point 2:

In Module 3, we learned that the basic structure of our teaching is represented in a complete cycle of action.





Starting Point 3:

Of course, as teachers, we have an idea of which media and materials we can use, which learning activities we prefer in the context of a certain content and which learning products our students should work on, or which teaching and learning interactions we want to incorporate into our learning situation.

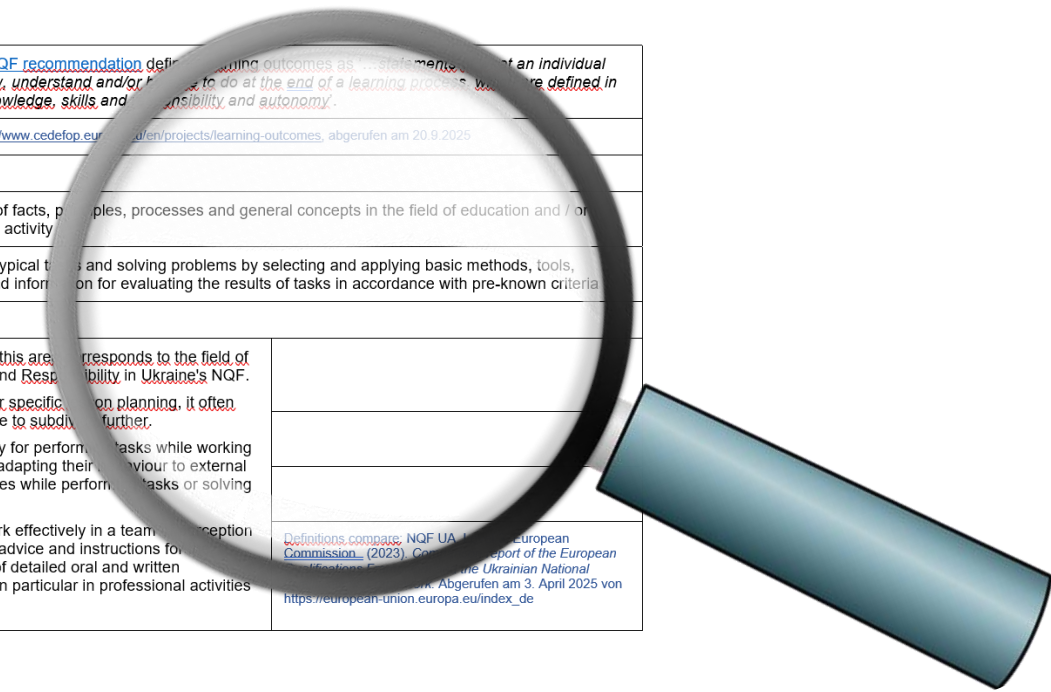
However, none of this has been planned yet in detail and needs to be systematically integrated into the structure of our learning situation, which we have already designed.

This brings us from the macro level of planning our learning situation to the micro level of concrete planning of the teaching and learning process.

Let's take a systematic look at where we are now in planning our learning situation:

Competence Descriptions for Learning Situations

General Learning Outcome: The 2017 EQF recommendation defines learning outcomes as "statements that an individual should know, understand and/or be able to do at the end of a learning process which are defined in terms of knowledge, skills and competences, responsibility and autonomy". Source: https://www.cedefop.europa.eu/en/projects/learning-outcomes , abgerufen am 20.9.2025	
Field of Competence	
Professional Competences	Knowledge knowledge of facts, principles, processes and general concepts in the field of education and / or professional activity
	Skills / Abilities performing typical tasks and solving problems by selecting and applying basic methods, tools, materials and information for evaluating the results of tasks in accordance with pre-known criteria
General and Key Competences	Personal and Social Competences Essentially, this area corresponds to the field of Autonomy and Responsibility in Ukraine's NQF. However, for specific learning planning, it often makes sense to subdivide further.
	Methodological Competences responsibility for performing tasks while working or studying adapting their behaviour to external circumstances while performing tasks or solving problems
	Learning Competences ability to work effectively in a team, reception of criticism, advice and instructions for the production of detailed oral and written messages, in particular in professional activities
	Communicative Competences Definitions compare: NQF UA 1, European Commission (2023) , Country Report of the European Commission (2023) , Ukrainian National Qualifications Framework . Abgerufen am 3. April 2025 von https://european-union.europa.eu/index_de



Source photo: Pixabay

Macro-level planning

Framework planning for the learning situation:

- Scenario / problem
- General structure according to work- and business processes
- Learning Product(s)
- Competences / learning outcome



Micro-level planning

Planning the teaching and learning concept / the learning process:

- Learning activities
- Teaching and learning interaction
- Methods
- Media concept
- Learning products in detail
- Chronological sequence
- ...

Implemen- tation

With
participation
and room for
manoeuvre for
students



Evaluation

- Assessment
- Quality of teaching and learning processes (with students' participation)



Micro-level
planning

**Planning the
teaching and
learning concept /
the learning
process:**

- Learning activities
- Teaching and learning interaction
- Methods
- Media concept
- Learning products in detail
- Chronological sequence
- ...

In recent times, this step
has been one of the
teacher's best-kept secrets.

quite old-
fashioned

...



Micro-level planning

Planning the teaching and learning concept / the learning process:

- Learning activities
- Teaching and learning interaction
- Methods
- Media concept
- Learning products in detail
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- ...

Implemen- tation

With
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Planning at the micro level is familiar to everyone involved in teaching and learning – including the students.

In modern teaching and learning, students are involved in shaping their learning processes – and thus also in planning.



Source: Pixabay

The implementation of lessons with students may also lead to changes in planning at the micro level.



This raises a few questions:

How can these structures be taken into account in the context of our lesson planning?

How can we successfully manage learning processes?

How can we involve students in planning their own learning processes?

How can we make these structures transparent for our students and for our colleagues, who might be involved in the learning situation (practical phases in the school workshop)?

Is there a way to combine our planning level (which we as teachers design) with the implementation level in the classroom (which involves the students)?

Before we look at tools, it makes sense to define the two levels of micro-planning (also found in the implementation-phase) in more concrete terms:

The **teaching/learning concept** describes the teaching-learning interaction, the media/materials used, the learning activities of the pupils and the resulting learning products.

The **learning process** is derived from the chronological sequence of the teaching/learning process and is based on predefined structures (other terms are articulation form and teaching phases).

See Tenberg, R., Bach, A., Pittich, D.: Didaktik technischer Berufe – Theorie und Grundlagen. Stuttgart: Franz Steiner, 2019, S. 201 ff.



Ideally, we combine the **teaching and learning concept** and the **learning process** for pupils and other colleagues involved in a comprehensible manner, either in analogue or digital form.

Both aspects must be visible and a continuous overview must be ensured during the implementation of the lessons.

Due to the large amount of information, digital tools are recommended.

Understanding the scenario

LF10: Component Design



Roller Shutter Control Scenario



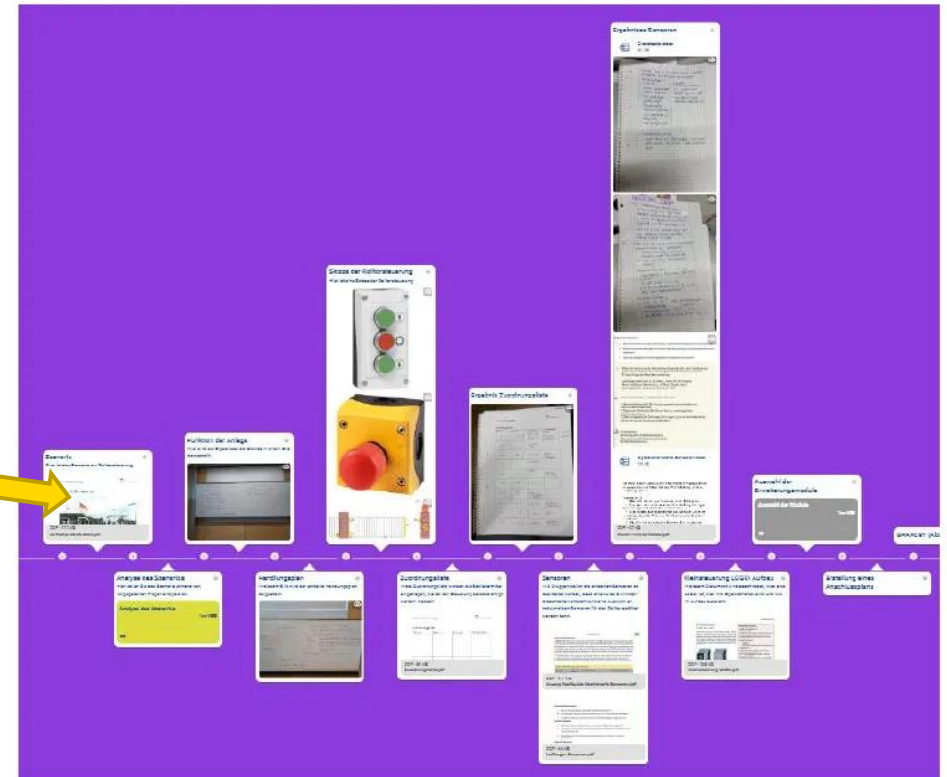
LF10: Проектування компонентів



Сценарій управління ролетними дверима

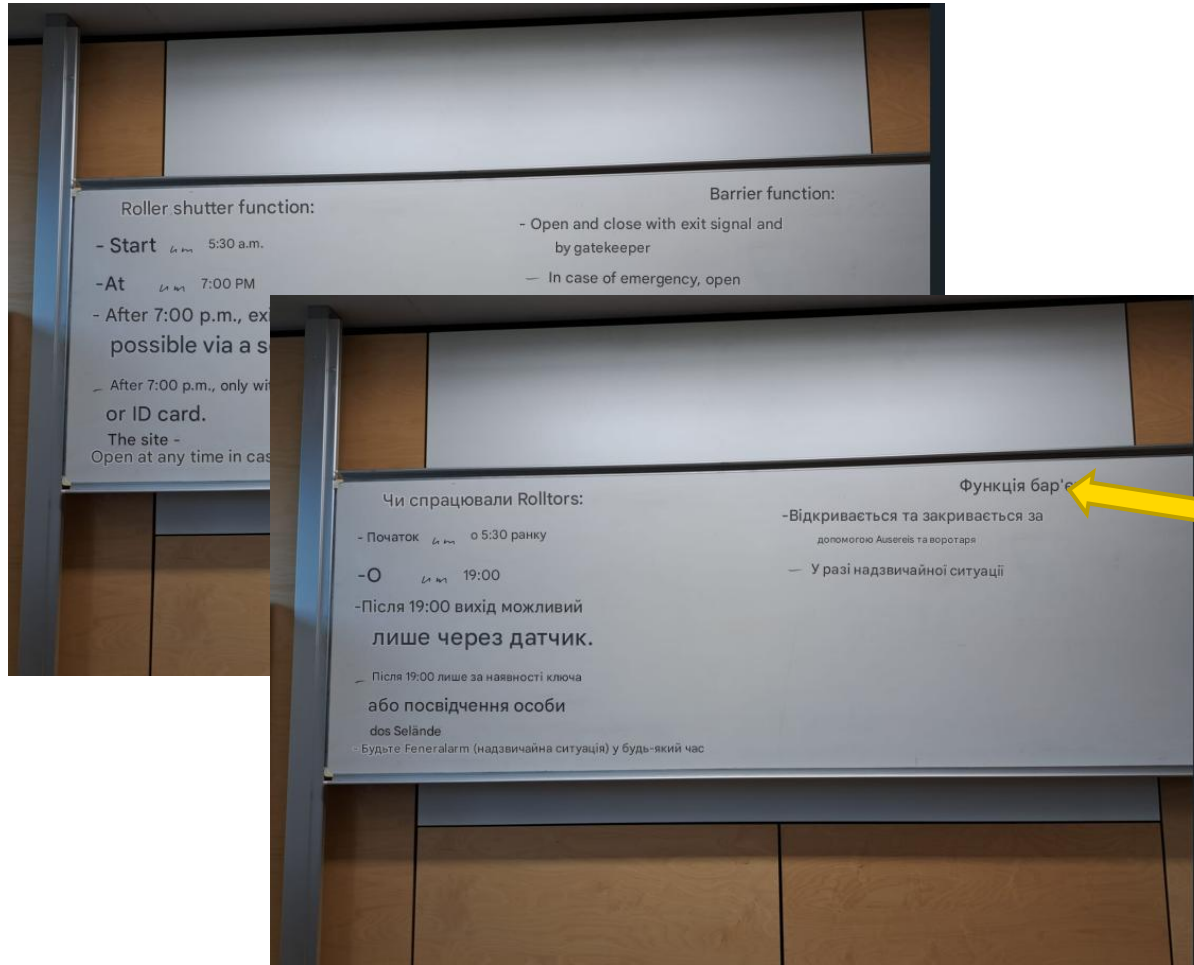


Rolltorsteuerung Verlauf

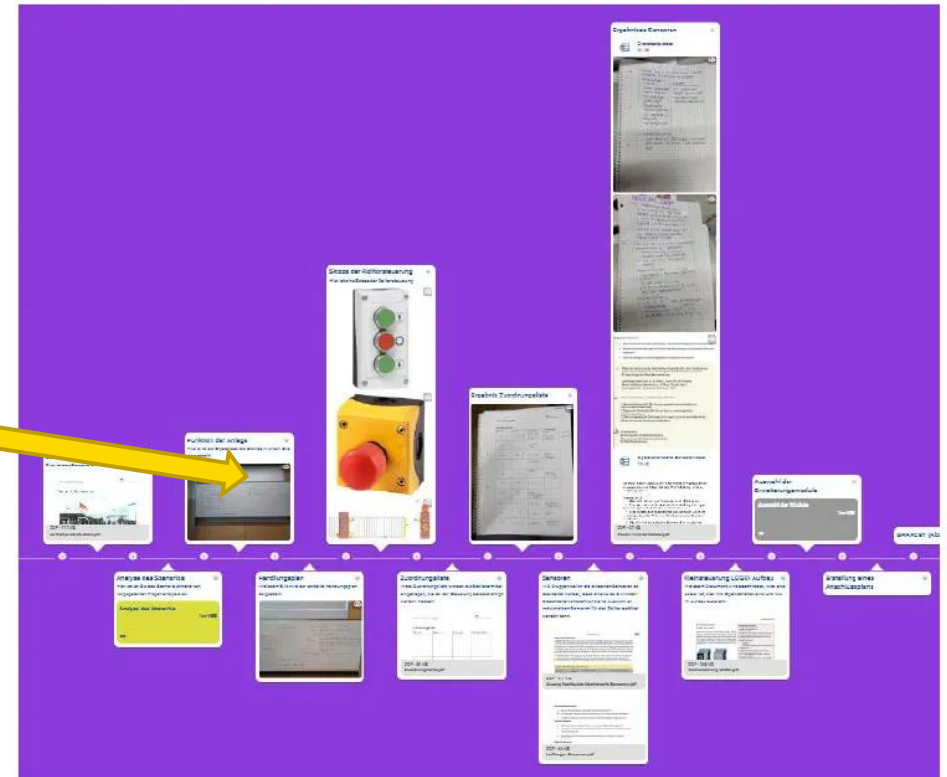




Deeper understanding of the problem



Rolltorsteuerung Verlauf



Overview of Binary Sensors

Figure 2, page 503, lists various non-electrical quantities that can be detected by sensors. In mechatronic systems, for example, it must be determined whether an object has fallen below a certain distance, which is equivalent to a rough distance measurement, or whether a liquid in a container has exceeded a certain level. On the other hand, it must also be checked whether a thread has been cut or whether the cutting tools in a CNC machine have not broken off or chipped. Sensors are used to detect all of this different information.

They can

- Binary
- Digital
- Analog

Огляд бінарних датчиків

На рисунку 2, стор. 503, перелічені різні неелектричні величини, які можна виміряти датчиками. Наприклад, у мехатронних системах необхідно визначити, чи перемістився об'єкт нижче певної відстані, що еквівалентно приблизному вимірюванню відстані, або чи перевищила рідина в контейнері певний рівень. З іншого боку, також необхідно перевірити, чи не нарізано різьбу, чи не зламалися та не відколотися ріжучі інструменти на верстаті з ЧПК. Датчики використовуються для запису всієї цієї різноманітної інформації.

Їх можна умовно розділити на:

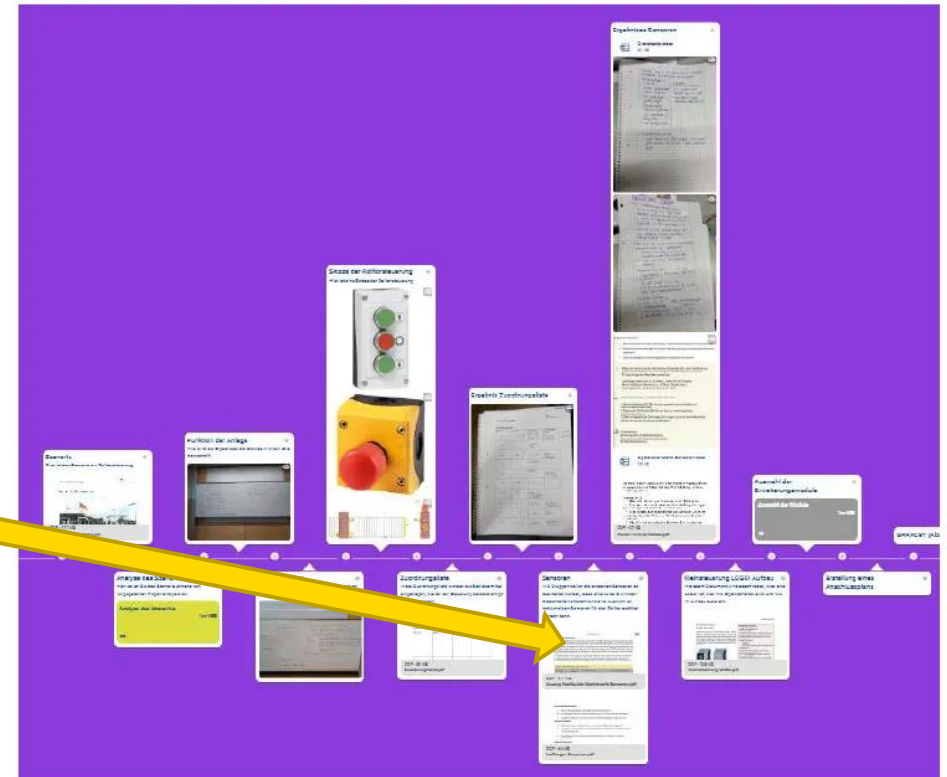
- Бінарні датчики (вихідний сигнал, сигнал перемикання УВІМК./ВИМК.; напруга 0 В/24 В; струм 0 мА/20 мА)
- Цифрові датчики (числовий запис відстаней, наприклад, датчики інкрементального переміщення)
- Аналогові датчики (виявлення залежних від часу змінних, таких як температура, тиск, вимірювання товщини)

Таблиця 1: Огляд деяких бінарних датчиків

Тип датчика	Робота без контакту	Фізичний принцип	Що записують, вимірюють?
Кінцевий вимикач	ні, тактильний ¹	Контакт через важільну систему	Відстань, рівень, тиск
Датчик індуктивності	і	Датчик генерує магнітне поле розсіювання. Електропровідний матеріал, який потрапляє в це поле, впливає на магнітне поле та запускає процес перемикання.	Перевищено або недосягнуто відстані до об'єктів.

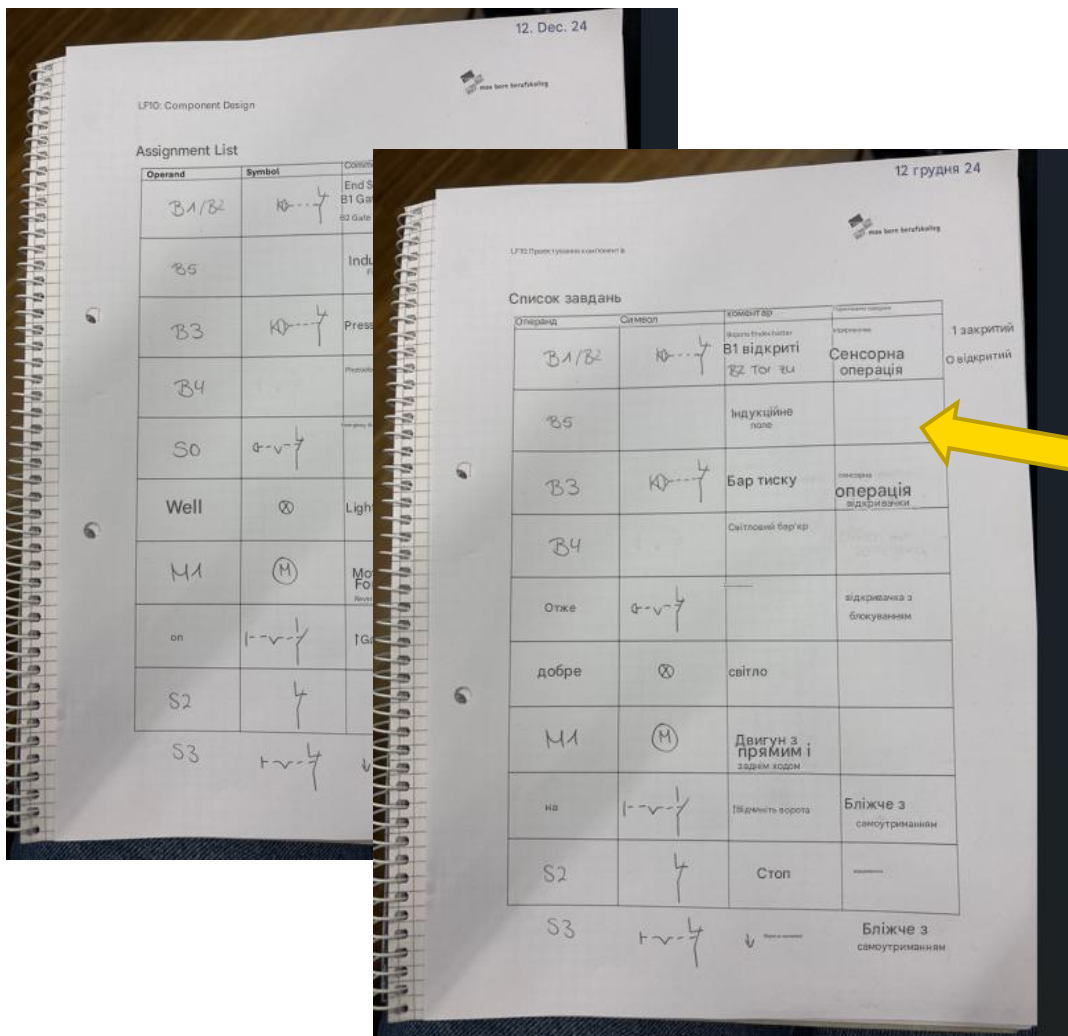
Obtaining necessary information

Rolltorsteuerung Verlauf

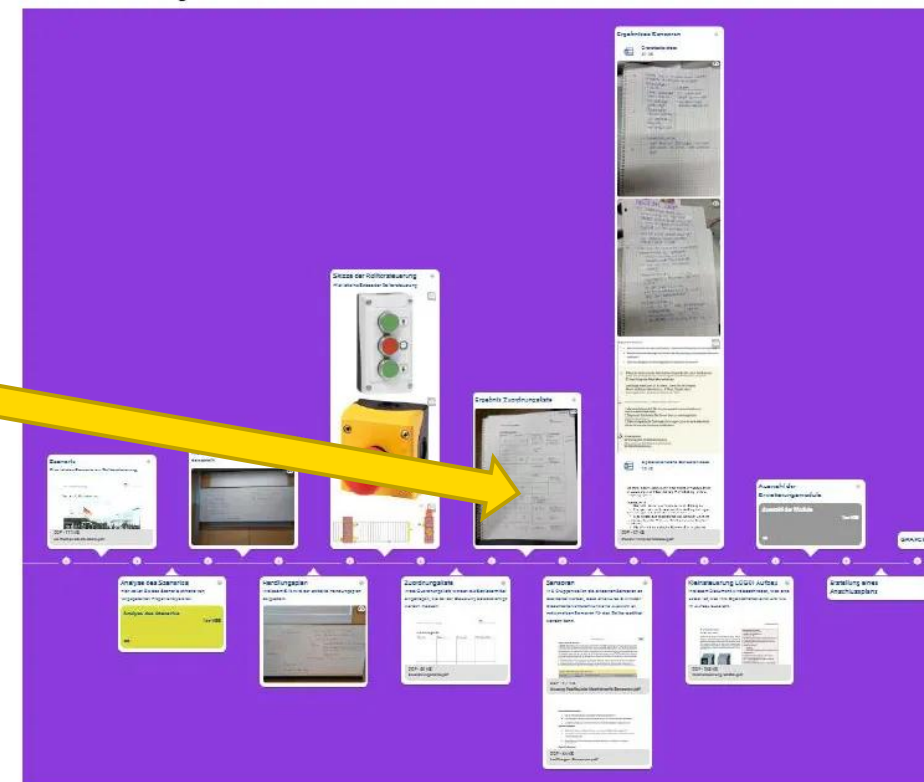




Problem solution step by step

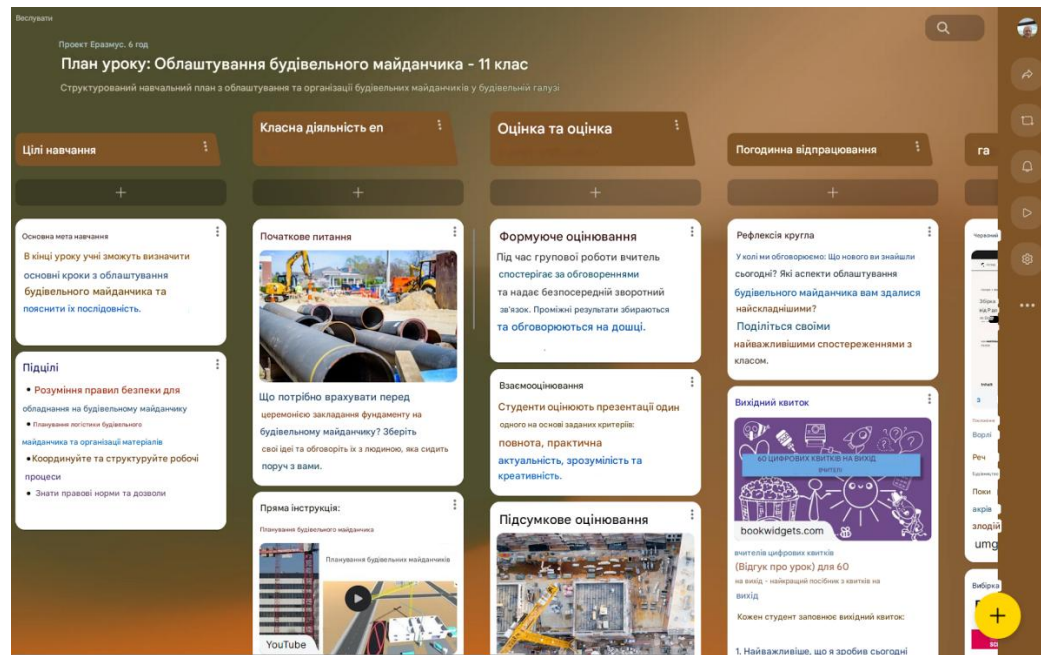


Rolltorsteuerung Verlauf



These slides show the implementation phase, i.e. the joint work with the students.



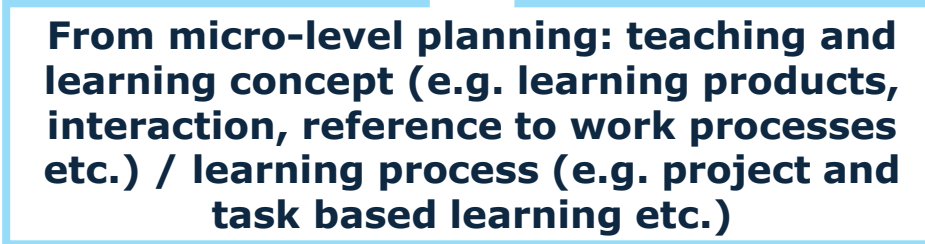
As teachers, it is advisable to document our didactic and methodological planning on a separate board. This can have the same structure. Alternatively, 'traditional' analogue documentation would also be possible.



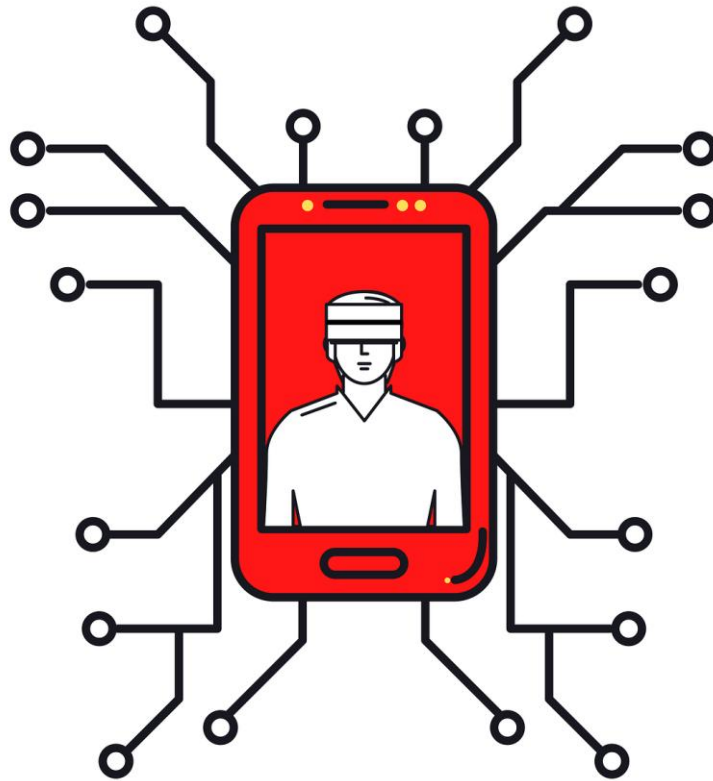
Planning grid for the micro level of lesson planning / Схема планування на мікрорівні планування уроків

	<u>Competences / компетенції</u>	<u>Content / Зміст навчання</u>	<u>Teaching and learning concept – learning process / Концепція викладання та навчання – процес навчання</u>
1			
2			
3			
4			

Planning grid for the micro level of lesson planning / Схема планування на мікрорівні
планування уроків

	<u>Competences / компетенції</u>	<u>Content / Зміст навчання</u>	<u>Teaching and learning concept – learning process / Концепція викладання та навчання – процес навчання</u>
1	 <p>from macro-level planning</p>	 <p>from macro-level planning</p>	
2			
3			 <p>From micro-level planning: teaching and learning concept (e.g. learning products, interaction, reference to work processes etc.) / learning process (e.g. project and task based learning etc.)</p>
4			

Using AI for lesson planning...



Source: Pixabay

... useful, but with limits.

An example: Using PADLET on the macro- and micro-level of a lesson plan:

The image displays two screenshots of a Padlet board used for lesson planning. The left screenshot shows a macro-level overview of the lesson plan, titled "План уроку: Облаштування будівельного майданчика - 11 клас". It includes sections for "Цілі навчання" (Learning Objectives), "Класна діяльність" (Class Activities), "Оцінка та оцінка" (Evaluation and Assessment), and "Рефлексія" (Reflection). The right screenshot shows a micro-level view of the lesson plan, titled "Lesson Plan: Setting Up a Construction Site - Grade 11". It includes sections for "Learning Objectives", "Lesson Activities", "Evaluation and Assessment", and "Lesson Conclusion".

<https://padlet.com/michaelerz/unterrichts-plan-einrichten-einer-baustelle-klasse-11-4mc0ndbg38wwe9dc>
ErasmusUA

Job 6.1



Photo: Michael Erz, BOT

Hallo Erasmus-Projekt
Hoffe, du hast einen
zauberhaften Tag!

- Von vorne
beginnen
- KI-Rezepte
- Rezepte

Ein Padlet erstellen

Leere Tafel
Eine kollaborative digitale
Pinnwand zum Sammeln,
Organisieren und Teilen...

Create new Beispiele ansehen

Leere Sandbox
Eine digitale Leinwand für
die Zusammenarbeit mit
Werkzeugen zum Zeichne...

Create new Beispiele ansehen

KI-Rezepte BETA

- Diskussionsforum **Neu**
- Unterrichtsaktivitätenerste **Neu**
- Unterrichtsplan
- Ideen für Unterrichtsaktivitäten
- Ereignis-Timeline
- Lektüreliste

Let's create a plan using
Padlet's AI and carefully check
the quality.

Document your evaluation
directly in the generated Padlet
on the right-hand side.

Work in small groups of three or
four.



Let`s discuss your evaluation ...



Source: Pixabay

Job 6.2



Photo: Michael Erz, BOT

Now that we have explored some of the possibilities of lesson planning with AI, it is time to design a working platform for working with students (implementation).

We will use Padlet again for this.

Option 1: You continue working on the learning situation that you have already designed at the macro level.

Option 2: We will use Padlet to create a draft learning situation for another learning outcome, and you will design the platform for working with students.

In the Padlet for this Module 6, you will find a prepared platform with a timeline. If you decide on a different template, I can create it very quickly.

Important: The complete action should be depicted. Add work assignments and information material. Which learning products should the students upload? What is the final learning product?

Prepare your results for a gallery walk.

Presentation and discussion: Gallery Walk



Source: Pixabay