TEACHER TRAINING
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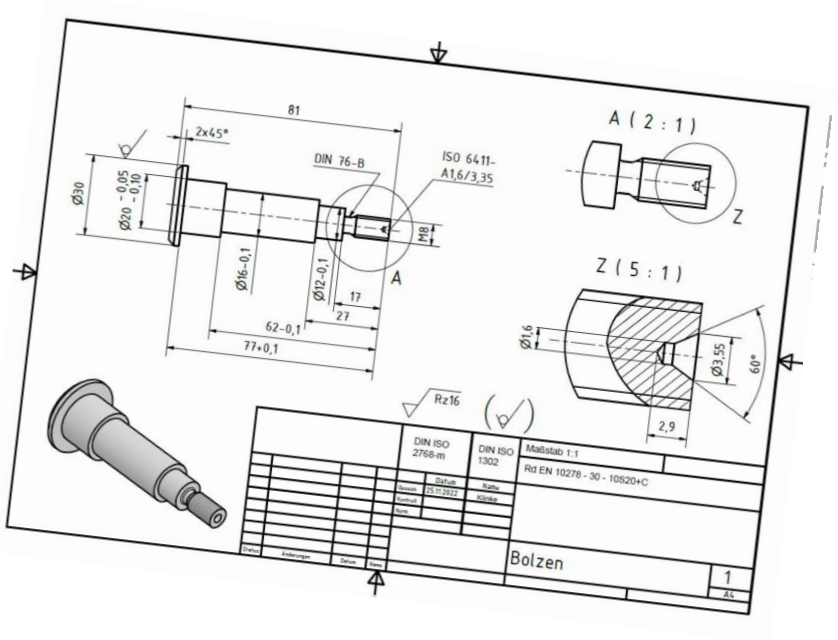
Learning situation: Analysis of a technical drawing



Self Organised Learning with the Help of a Concept Board

Jan Müther, Courtney Ritzenhoff, Sebastian Klinke

Müther, Ritzenhoff, Klinke

Content

- Introduction of the class
- Learning structure grid for diagnostics
- Course of the lesson
- Presentation of the work results
- Methodological decisions
- Reflection
- Sources

Introduction of the Class

- Lower level of the two-year training
- Number of learners: 12 boys (age: 16-21 years)

Equipment:

- Smartboard
- Teacher PC
- Document camera
- Pupils' smartphones

Learning Structure Grid for Diagnostics

Levels taking into account language

	Lernstrukturgitter (in Anlehnung an Weber, Putzer und Polias)				
	Klasse:		Thema:		
Kreieren/ Problemlösen [Fachsprache] – Schüler*innen entwerfen Lösungen zu problemorientierten Sachverhalten in gestaltender Form. Operatoren: erkunden, Hypothesen aufstellen, voraussagen, simulieren, andere Perspektiven einnehmen, neugestalten					
Evaluieren [Fachsprache] – Schüler*innen erörtern und bewerten selbstständig unterschiedliche Sachverhalte. Operatoren: definieren, identifizieren, charakterisieren, argumentieren, Stellung beziehen, überprüfen beurteilen, hinterfragen, reflektieren transferieren					
Analysieren [Fachsprache] – Schüler*innen untersuchen Sachverhalte systematisch und gezielt und werten diese aus. Operatoren: Ursache ausdrücken, Wirkung ausdrücken, Schlussfolgerungen ziehen, kritisieren, ableiten, transferieren					
Anwenden [in Zusammenhang bringen] – Schüler*innen wenden Informationen/ Wissen / Kompetenzen auf spezifische Sachverhalte an. Operatoren: klassifizieren, vergleichen, abgleichen, in Zusammenhang bringen, einordnen, zuordnen, begründen		Sean	Nico Max H.	(Normung)	Die Lernenden sind in der Lage normative Vorgaben aus technischen Zeichnungen mit Tabellenwerken zu klassifizieren und mit den Funktionen des Bauteils in Zusammenhang zu bringen, um die Fertigung des Bauteils funktionsgerecht planen zu können.
Verstehen [in eigenen Worten wiedergeben] – Schüler*innen beschreiben und strukturieren Sachverhalte Operatoren: beschreiben, kennzeichnen, charakterisieren, spezifizieren, herausarbeiten, kategorisieren, strukturieren, erläutern, erklären, Beispiele finden		~~Julien~~ Finn Philipp Maurice	~~Sascha~~ Max K. ~~Alexander~~	(Allgemeintoleranzen) Hilfekarte	Die Lernenden sind in der Lage Allgemeintoleranzen mit Tabellenwerken zu ermitteln und auf Abmessungen in technischen Zeichnungen zu übertragen, um in der Fertigung geforderte Toleranzbänder einhalten zu können.
Erinnern [Alltagssprache] – Schüler*innen berichten über Sachverhalte auf der Grundlage des allgemeinen Wissens. Operatoren: wiedergeben, berichten, kennen, aufzählen, benennen, nacherzählen		~~Dominik~~ Damian		(Abmessungen, etc.) Hilfen - Visualisiert	Die Lernenden sind in der Lage Toleranzfelder anhand von Bemaßungsangaben in technischen Zeichnungen mithilfe eines Beispiels (Lernkarte etc.) zu benennen, um in der Fertigung geforderte Toleranzbänder einhalten zu können.
	1. Gitter: Fakten, Gegenstände, Situationen, Phänomene	*2. Gitter:* Mehrere Fakten	*3. Gitter:* Zusammenhänge, Beziehungen, Abläufe	*4. Gitter:* Mehrere Zusammenhänge	*5. Gitter:* Ideen, Vorstellungen, Modelle, Gesetzmäßigkeiten, Regeln

Classification of learners according to current performance level

Complexity of the subject content

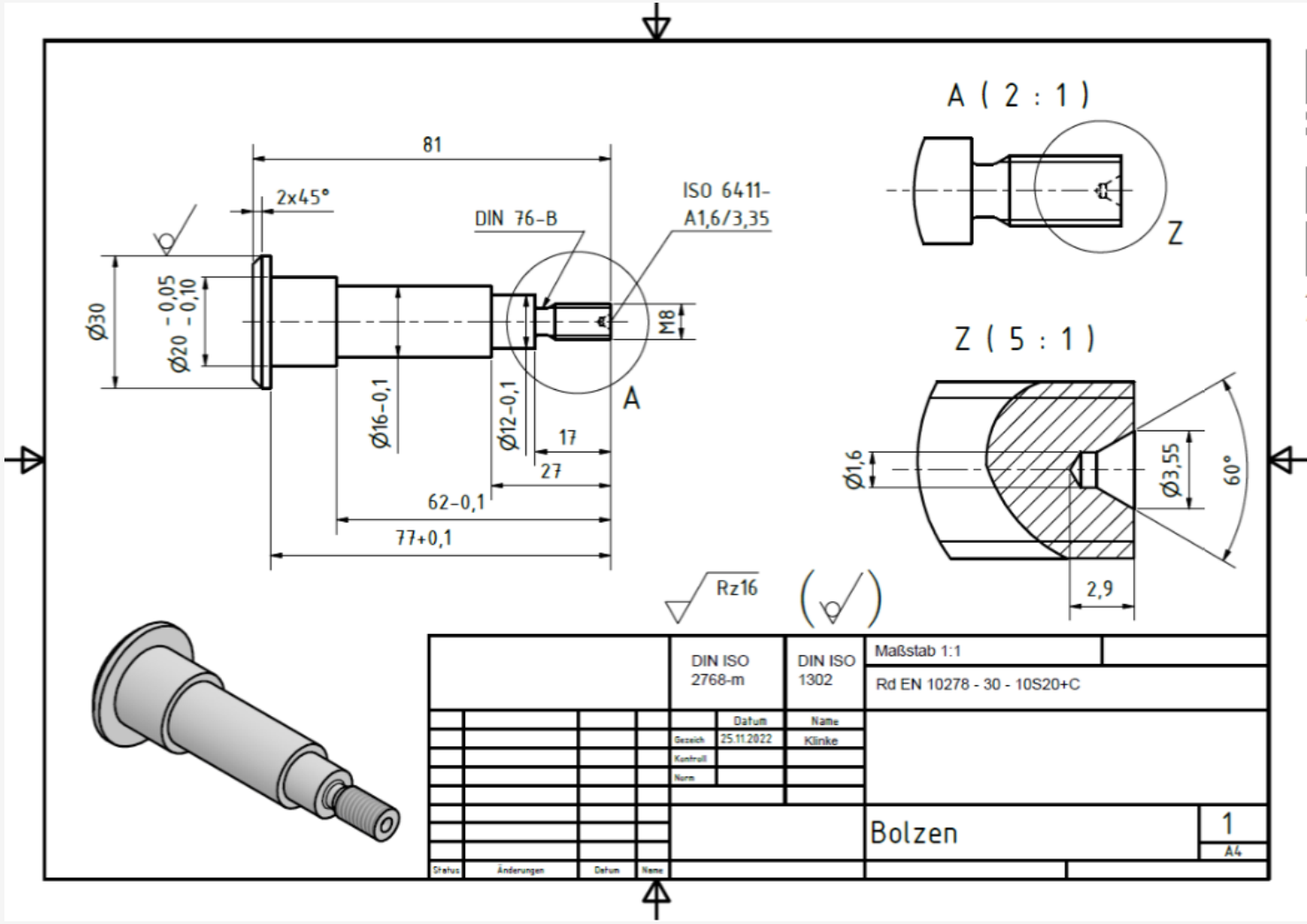
Learning Structure Grid for Diagnostics

- The learning structure grid, is a diagnostic tool to categorise the learners' competences more precisely.
- Classification of learners according to their current level of skills (based on own observations in the classroom and exchange with colleagues)
- In the grid, the subject-specific learning gain is visualized by start and target points.
- Colours in the structural grid:
    - Red: Basic level
    - Blue: Support level
    - Green: Extension level

Course of the Lesson

- Introduction

- Handing over the scenario as a dialogue between master and apprentice
- Determine the procedure for analysing the technical drawing



Course of the Lesson

Elaboration I

Procedure:

- Work in homogeneous groups differentiated according to the actual level of competencies
- Each group works on a work assignment that suits the respective performance level of the group members.
- Groups work on different aspects of the technical drawing with different focuses

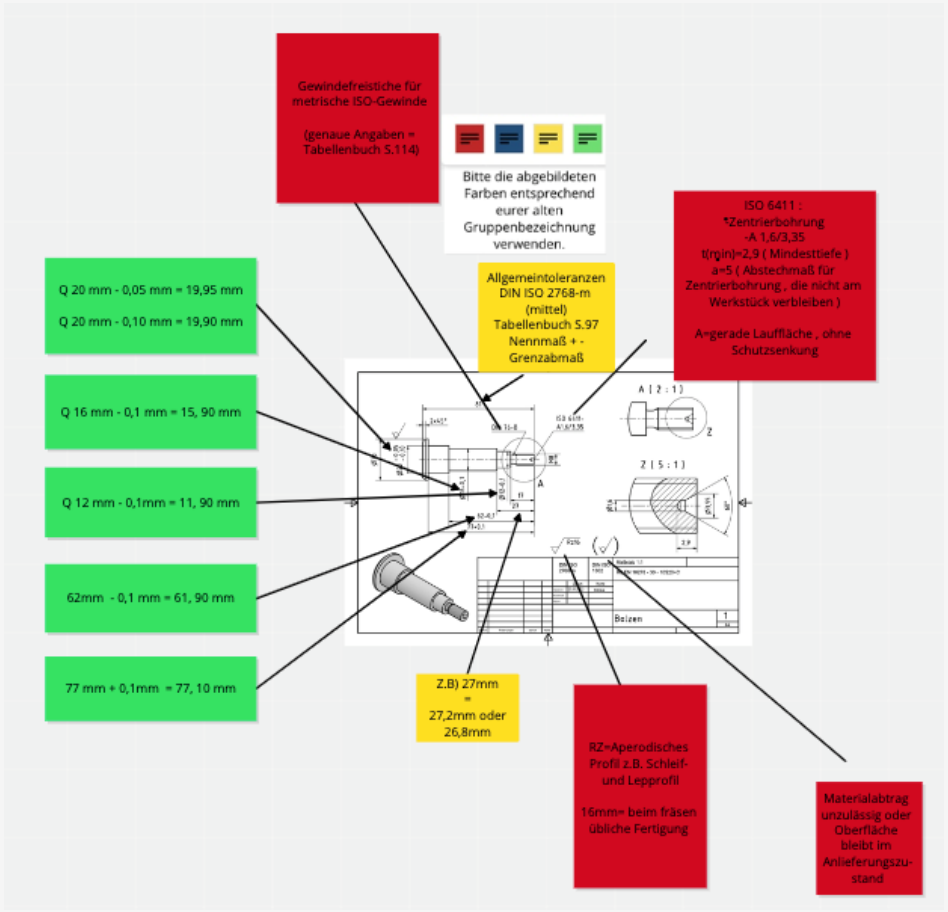
Course of the Lesson

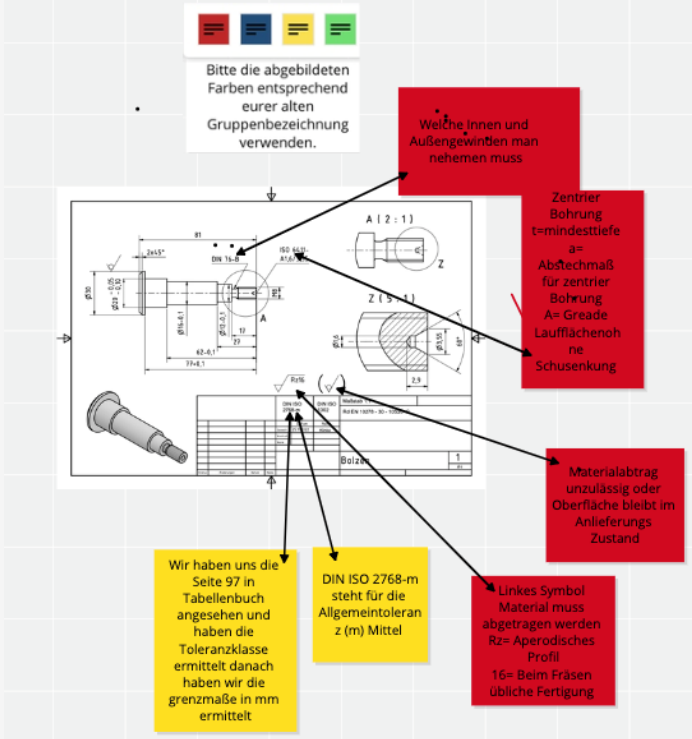
Elaboration II

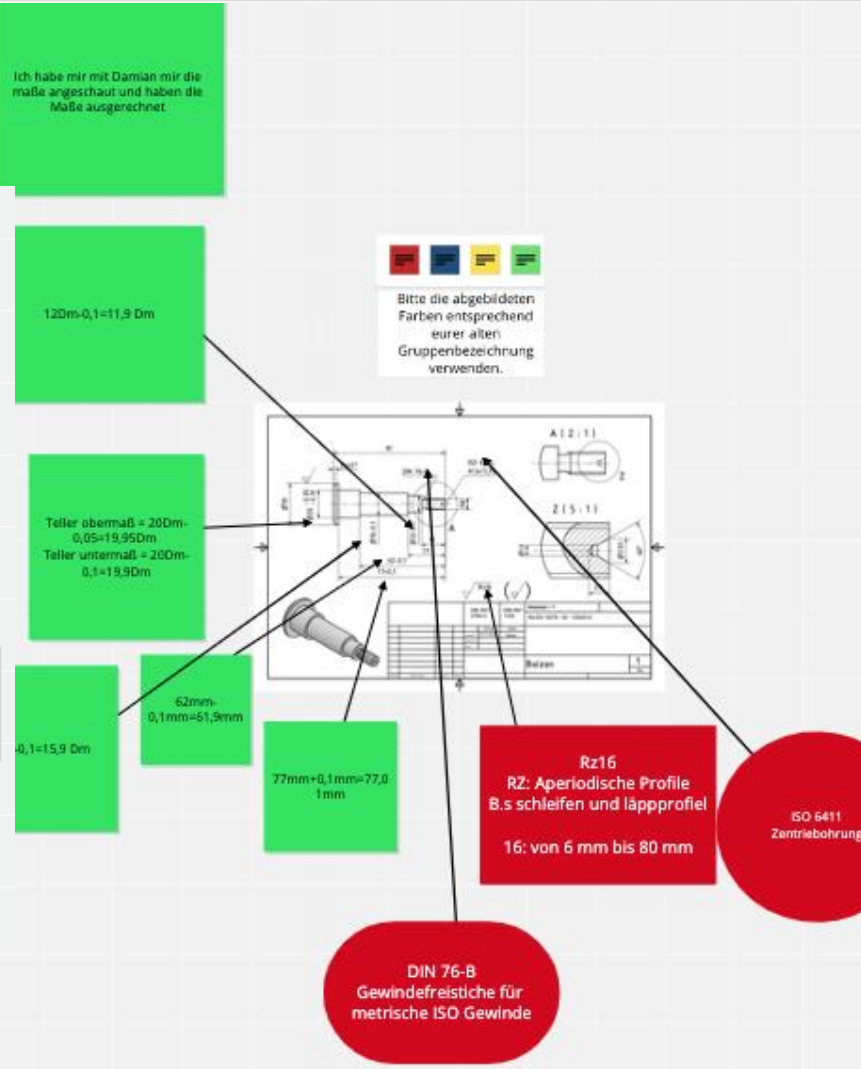
Procedure:

- Exchange in heterogeneous mixed groups with different performance levels of the individual group members
- Results of the work phase are presented and compiled in the new group.
- Mixed groups create a joint result (Conceptboard with the technical drawing and the learners' explanations).

Work Results







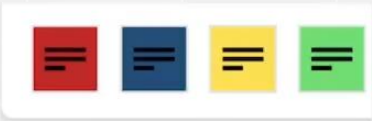
Schließen

Drehen Gruppe 1 HISTORY

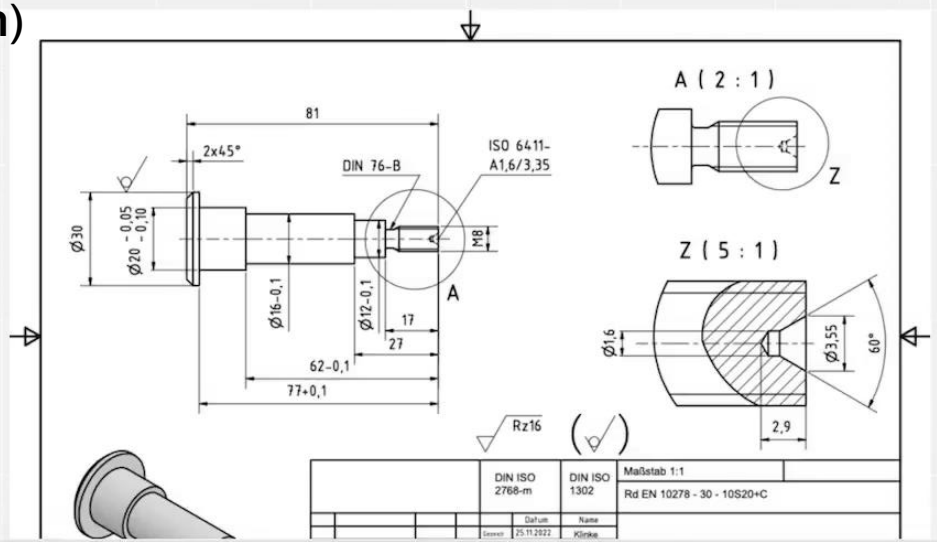
100% Zoom anpassen

k D HF

The history mode of the software makes it possible to trace the students' work process (individual work steps in chronological order in retrospect,
e.g. to analyse the learning process and identify learning problems. (Software: www.conceptboard.com)



Bitte die abgebildeten Farben entsprechend eurer alten Gruppenbezeichnung verwenden.



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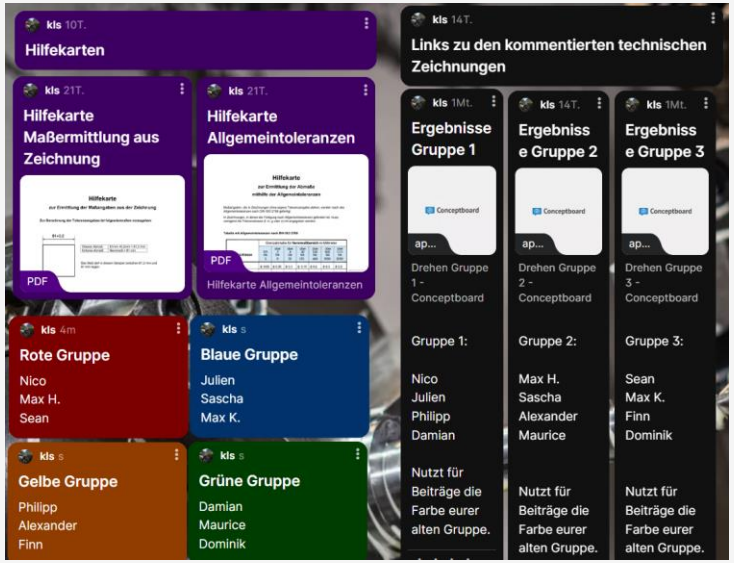
Diese Version wiederherstellen

www.conceptboard.com

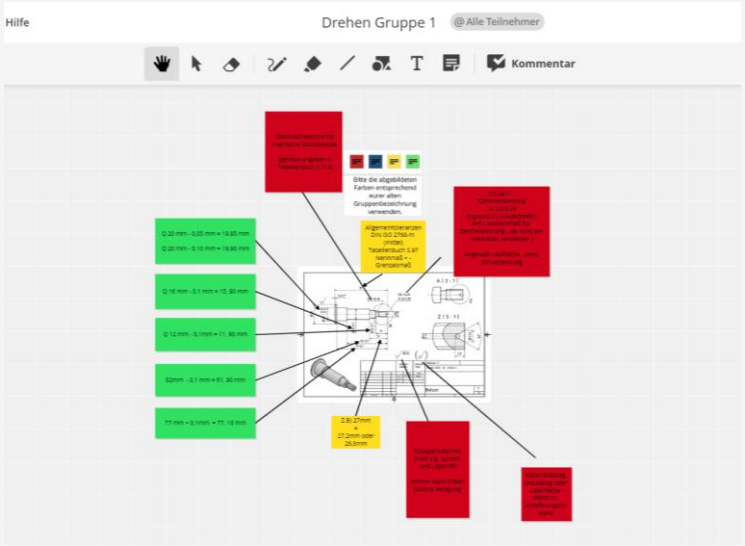
Methodological Decisions

- Padlet



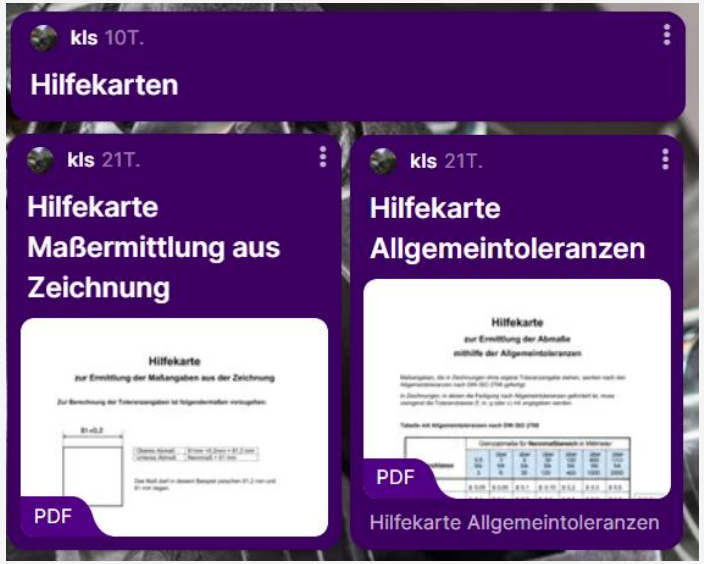
- Organisation of the Learning situation

- Conceptboard



- Platform for the documentation of the results

- Help cards



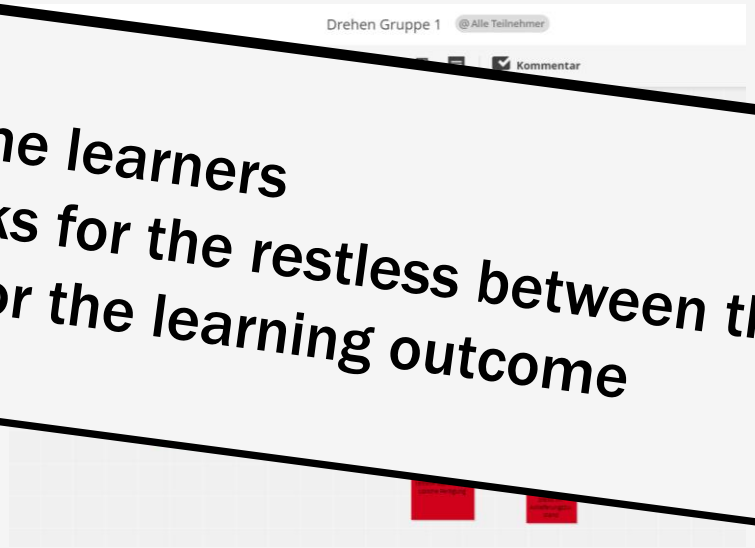
- Support for lower-performing students

Methodological Decisions

- Pad

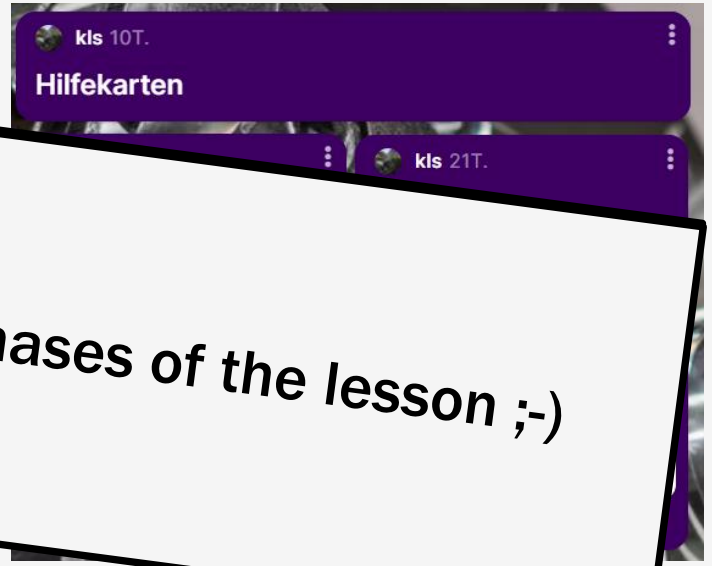
- Organisation of the Learning situation

- Conceptboard



- Created action product
- Benefits for further teaching

- Help cards



- Support material for [illegible] performing students

Modified group puzzle:

- Many interactions of the learners
- Short movement breaks for the restless between the phases of the lesson ;-)
- Shared responsibility for the learning outcome

Methodological Decisions

Advantages of the chosen (digital) media concept:

- activation of several channels of perception
- possibility of cooperative, simultaneous and self organized work
- accessible any time
- work process infinitely repeatable
- possibility to review the students`individual learning processes
- allows the common reflection of the students`own learning process
- increasing the students`concentration

Was the classification chosen correctly?

Anwenden [in Zusammenhang bringen] – Schüler*innen wenden Informationen/ Wissen / Kompetenzen auf spezifische Sachverhalte an. Operatoren: klassifizieren, vergleichen, abgleichen, in Zusammenhang bringen, einordnen, zuordnen, begründen		Sean	Nico Max H.
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Checking the learners‘ progress
Recognizing individual development

- Predominantly correct assessment
- One student performed much better than usual because the person sitting next to him was not present.

Literature

- School Act NRW §2 paragraph 4, 5
  - 4: The school imparts the knowledge, skills and values necessary to fulfil its educational mission, taking into account the individual requirements of the pupils.
  - 5: ... are given special support according to their individual needs...
- Concrete information on individual support can be found in the following examples Framework curriculum
  - Fachschule für Technik NRW in chapter 1.3.3. "Individualisation and differentiation of teaching".
- Handout "individual support" of the Münster district government
  - Volume 1: Explanation of the basics of individual support
  - Volume 2: Concrete tips for the implementation of individual support in practice
  - Ex: Design of lessons, promotion of key competences, support of pupils with special needs, cooperation with parents and extracurricular partners.
- Training and Examination Regulations for the Courses of Study at the Berufskolleg (APO BK)
  - Legal basis for the work at vocational colleges
  - § Section 6(2): ... enables pupils to supplement, extend and deepen their knowledge and skills according to their individual abilities and inclinations.
  - Exemplary Appendix A APO BK §21 Paragraph 3: ... Development of individual support plans, development discussions, internship visits, consultation with companies.

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