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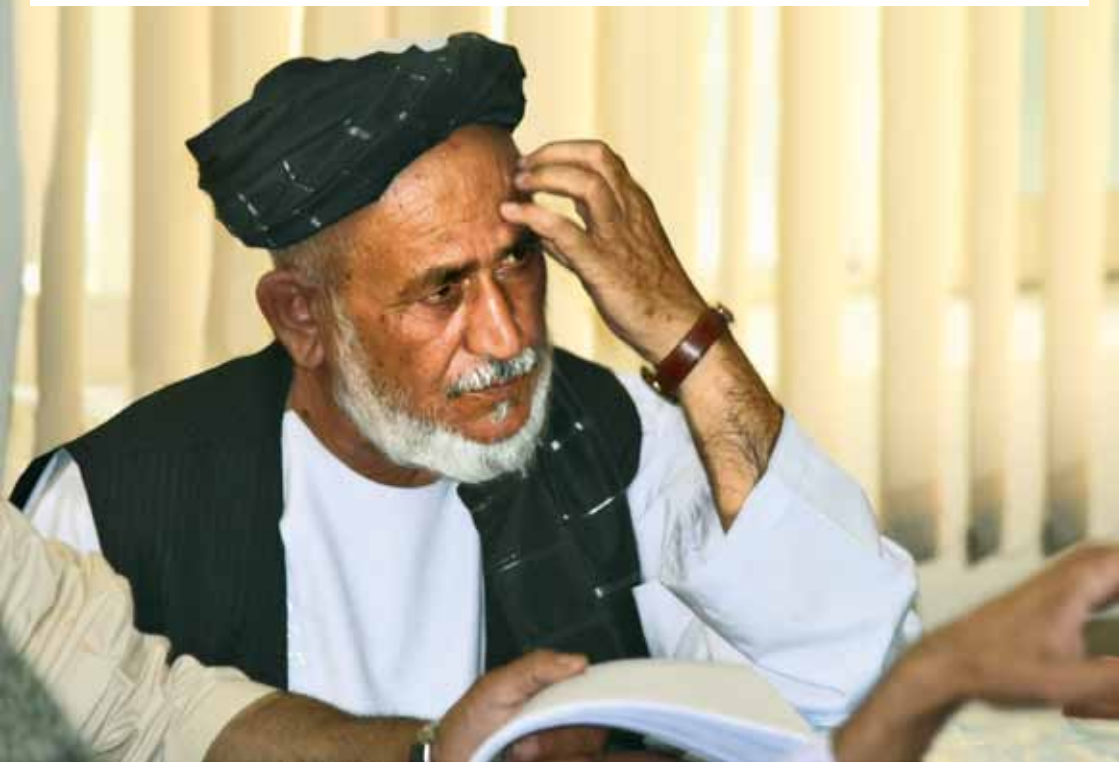

Lesson Planning and action-oriented Teaching

A Manual in Lesson Planning for Secondary Technical Schools

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A Manual in Lesson Planning for Secondary Technical Schools

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Contents

Preface

The services delivered by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH draw on a wealth of regional and technical expertise and tried and tested management know-how. As a federal enterprise, we support the German Government in achieving its objectives in the field of international cooperation for sustainable development. We are also engaged in international education work around the globe.

GIZ operates throughout Germany and in more than 130 countries worldwide. Our registered offices are in Bonn and Eschborn. We have 16,410 staff around the globe, almost 70 per cent of whom are employed locally as national personnel in partner countries.

Germany's involvement in international development programmes has a special emphasis on the importance of Technical and Vocational Education and Training for economic, social, and environmental development, and the GIZ has thus set vocational training in the central focus of its cooperation projects in many different countries. In this context, the programme *"Promotion of Technical and Vocational Education and Training in Afghanistan"* is aimed at improving the situation and conditions of life of as many Afghan youths as possible by enabling them to take part in vocational training schemes specifically adapted to the local conditions. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), the programme provides multi-level support in establishing a sustainable and formal, target-group adapted TVET system and in building competencies and resources in the TVET directorate of the Afghan partner ministry.

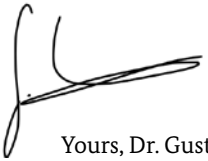
In addition, the Vocational Training programme supports traditional company-based vocational training in the informal sector. The programme is currently developing a strategy that takes this culture-specific feature into due account: Apprentices are enrolled into well-equipped vocational schools. Here, not only the apprentices themselves, but also journeymen and owners of companies are provided with access to state-of-the-art technology and contemporary know-how. Furthermore, the programme aims at enabling cooperation between the representatives of the informal sector and those in the state sector according to the principle of subsidiarity. The intention here is to create an efficient and productive company-based vocational training, in its basic approach comparable with the system of dual Technical and Vocational Education and Training established in Germany, which will spare Afghan society considerable investment costs and enable youths to enjoy a high quality of vocational training.

This publication, **Lesson Planning and action-oriented Teaching - A Manual in Lesson Planning for Secondary Technical Schools**, provides action-guiding information on the *planning, implementation, and evaluation of theoretic vocational lessons*, at the same time providing the necessary scientific background knowledge in the areas of *learning psychology, teaching and learning / didactics, the tasks of teachers, and the evaluation and quality of teaching and learning.*

In view of our intention to keep this manual as close to the actual needs as possible, we are extremely grateful for the critical and constructive feedback of our readers. The didactical manual is available in German, English, and Dari, in both the printed and electronic form: www.giz.de/de/mediathek/116.html.

Our special thanks go out to all who have made their valuable contributions to this didactical manual.

We hope you have a pleasurable and profitable experience reading this manual in your teacher training and your independent studies.



Yours, Dr. Gustav Reier

Introduction

This text is a lesson-planning guide for teachers, especially those working in Secondary Technical Schools. There are overviews and summaries at the beginning and end of each chapter. The last part of the appendix contains a glossary explaining basic terminology.

The **first chapter** Lesson planning contains all the necessary steps for planning lessons. Important formulae, methods and media resources are presented here in short. The methods are categorised according to the phase of instruction. Those that are suitable for the start of a lesson are presented first and followed by those which are appropriate to elaborate a subject. The formulae and methods are presented in greater detail in the appendix. Therein is a collection of methods. Furthermore there are also examples of lesson plans in the **appendix**. Therefore, it makes sense to read the appendix while going through Chapter 1.

Chapter 2 contains basic principles of psychology that are significant for learning. At the end of this chapter are conclusions from the psychology of learning that are suitable for planning lessons.

Chapter 3 is about integrating action-oriented teaching in lessons that take place in secondary technical schools.

Chapter 4 summarises the "art of teaching", which is known as didactics, and presents a didactic model and two subject related didactics as examples.

Teaching is only a part of the pedagogical mandate of teachers. The other tasks a teacher has are described in **Chapter 5**. They have an important function in the education and upbringing of young people. Those working in secondary technical schools should also have close links with the companies that employ young people who have finished their apprenticeship.

Chapter 6 contains the evaluation of teaching in the context of quality of teaching.

1. Lesson planning

1.1 Preliminary considerations: Basic goals (“What?”)

One of the central tasks of teachers is to prepare and give lessons. Whether they are good depends largely on whether they can plan lessons. There can be no good lessons without thorough and responsible preparation.

Guidelines for planning lessons

Lesson planning should be based on guidelines for a particular course of education’s syllabus. This will define the framework for classwork. A syllabus sets out what students should learn and which subjects should be covered in class.

Long-term lesson planning: From the syllabus to the teaching plan

A teaching plan for imparting material is derived from the syllabus. The topics to be covered should be spread out over the amount of available time (number of weeks) in the school year. This ensures that the syllabus for the year will be covered within the school year.

The teaching plan is based on classes

It is guided by the calendar and should include guidelines on subject areas and lesson goals, as well as take into account extra-curricular events, classwork and exams. There should also be a time buffer for unforeseeable events (See next page: Example Teaching Plan)

Medium-term lesson planning: Planning teaching units

When subjects are related, it makes sense to cover them together in the medium term. One subject area can be explored over several weeks. Material can be summarised and reduced. However, the leitmotif should remain clear throughout. It also makes sense to think about what methods and resources can be used in the medium term. If a teacher wants to watch a film with a class then it sometimes has to be ordered several days in advance.

Example teaching plan:

Week	Tue./Thurs	Subjects for first semester / Target	Ach.
38	15.09.	Introduction to business & management, working techniques, group work	
38	17.09.	Company planning: Exploration of field, summary of issues	
39	22.09.	Interview preparation	
39	24.09.	Exploration on the ground, presentation	
40	29.09.	"Market" simulation game, processes of business decisions	
40	01.10.	Presentations and evaluation of simulation game, company planning	
41	06.10.	Company's system of goals, type of goals, economic principles	
41	08.10.	Measuring goals: Productivity, cost effectiveness, profitability	
42	13.10.	Business functions and decision processes (Organisation)	
42	13.10.	Residual value	
43	22.10.	Visit a company: Talk with a businessperson	
44	23.10.	*Holidays*	
45	05.11.	*Holidays*	
46	12.11.	Introduction to acquisitions, legal basics, business capacity	
47	19.11.	1st class exercise, how contracts are drawn up, formal regulations	
48	26.11.	Types of contract, invalidity, contestability of contracts	
49	03.12.	Contract of purchase: Offer/acceptance, contents, obligations and fulfilment	
50	10.12.	Supply and payment conditions, terms and conditions, comparison of offers	
51	17.12.	Estate and property, retention of title	
52	25.12.	*Holidays*	
1	01.01.	*Holidays*	
2	07.01.	Postponed delivery and missing items	
3	14.01.	Default of acceptance and payment, claims insurance	

continue next page

Week	Tue./Thurs	Subjects for first semester / Target	Ach.
4	21.01.	Subject area: Stock-keeping, index numbers	
5	28.01.	Inventory control techniques	
6	04.02.	Visiting a company: Modern inventory control in practice	
7	11.02.	Payment transactions: History, types and functions of money	
8	18.02.	Checks, transfers, electronic cash, online banking, credit cards	
9	25.02.	*Holidays*	
10	04.03.	Exchange, including return bills	
11	11.03.	Visiting a company: A local bank - modern forms of payment and discussion with HR head	
12	18.03.	2nd class exercise, human relations: From the job advertisement to being employed	
13	25.03.	Application techniques, contract for traineeship and employment contract	
14	02.04.	Ending of a contract of employment, reference	
15	08.04.	*Holidays*	
16	15.04.	*Holidays*	
17	22.04.	Employee participation and labour agreement	
18	29.04.	Manufacturing: Production processes, rationalisation, impact on the job market	
19	06.05.	Company visit: Coca-Cola (Factory and marketing)	
20	13.05.	3rd class exercise, evaluation of the company visit	
21	20.05.	Marketing and sales: Introduction to instruments,	
22	27.05.	*Holidays*	
23	03.06.	*Holidays*	
24	10.06.	Market research	
25	17.06.	Product policy	
26	24.06.	Sales policy	

Week	Tue./Thurs	Subjects for first semester / Target	Ach.
27	01.07.	Company visit: Advertising agency	
28	08.07.	Advertising: Advertising film project	
29	15.07.	Advertising film project	
30	22.07.	Advertising film project	
31	29.07.	Project presentation	

Fig. 1: Teaching plan

You will find a master copy in the appendix.

Master copy for a timetable:

Week	Date	Content Target	Achievement
1			
2			
...			

Fig. 2: Master teaching plan

Short-term planning: The lesson

Single lessons should be prepared in writing. Teachers who are at the start of their career can benefit particularly from detailed written plans. The short-term preparation of lessons generally covers subject, goals and a clear idea of how a class should unfold.

1.2 Further considerations: Successful concepts (“How?”)

The mandate of Secondary Technical Schools

The mandate of secondary technical schools is to impart to students a comprehensive set of skills that they can use to behave and act. This contains several facets. At the end of their training, students should be qualified to carry out a particular profession and should also have developed their personalities. Secondary technical schools have two important tasks therefore: They should impart skills to their students, both in theory and in practice, as well as prepare them to live their lives within their family and society responsibly. Whether students have acquired this particular set of skills is reflected in their ability to solve tasks they are likely to come across at work with competence, and in a manner that is both appropriate and common. The same is true for their lives outside of work.

1.2.1 Competence can be divided into several sub-categories

a) **Specialist knowledge:** The readiness and ability to solve tasks and problems clearly on the basis of subject-related knowledge using certain methods and acting independently, as well as to evaluate the result.

b) **Personal competence (Life-skills):** The readiness and ability to tackle development opportunities, demands, family constraints, career and public life as an individual, to think things through, to judge one's own ability and skills and to develop further plans for life. This also includes personal characteristics such as independence, the ability to criticise and be criticised, self-confidence, reliability, responsibility and an understanding of duty, as well as the development of thought-through moral concepts and the self-determined connection to values.

c) **Social competence:** The readiness and ability to sense and shape social relations, to understand tensions, to know how to deal with others in a rational and responsible manner and to make oneself understood. The development of social responsibility and solidarity is important here.

Moreover, we use terms such as method-related competence or methodical competence, communicative competence and learning competence. These skills belong to the greater categories of specialist knowledge, human competence and social competence.

Method-related competence = readiness and ability to develop a target-oriented, plan-based approach to tasks and problems (for example when planning particular steps)

Communicative competence = readiness and ability to understand and shape situations of communication. This includes perceiving, understanding and representing one's own intentions and needs, as well as those of partners.

Learning competence = readiness and ability to understand information about facts and contexts on one's own as well as with others and to evaluate and order it in thoughtful structures. The readiness and ability to develop learning techniques and strategies at work and away from work and to use them for lifelong are also included in this category.

The following diagram shows the connections between the individual aspects of behaviour-related competence.

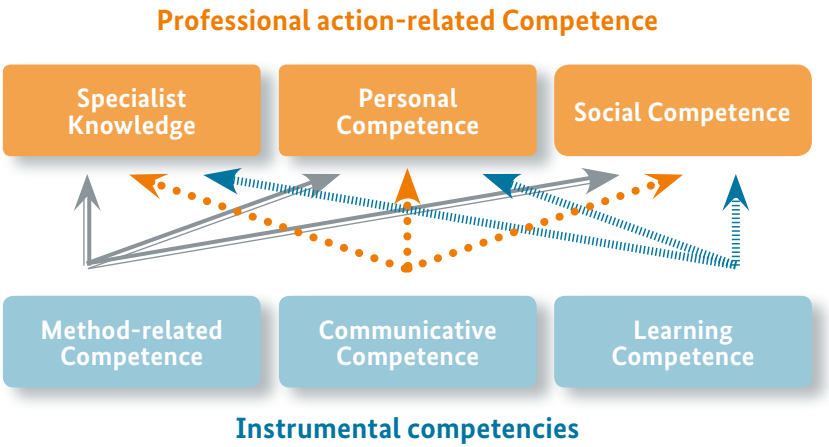


Fig. 3: Competence model according to KMK/Bader

1.2.2 Guidelines for professional education: Action and competence-related orientation

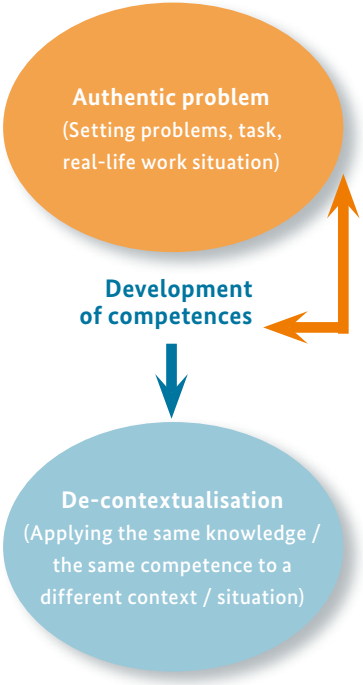
Action and competence-related orientation is central to professional teaching. The mission statement of action-related teaching is summarised as follows:

- Learning for action
- Learning through action
- Independent planning, checking, correction and assessment
- A comprehensive understanding of professional reality
- Integrating and reflecting the students' experiences.

A basic foundation of action-related teaching is that thinking structures develop from interiorised actions, i.e. that "thought is order of action" (Aebli - a Swiss psychologist). A term emerges from grasping, an insight from experience and its reflection and knowledge from research, observation, consideration and linking with existing knowledge.

1.2.3 Learning areas concept

The learning areas concept in secondary technical schools can be interpreted as the consistent continuation and implementation of action-oriented teaching (see Chapter 3). The numerous aspects of action-related and situation-related learning can be reduced to certain significant characteristics:



Introducing a topic/subject with the help of an authentic problem.
Students try to solve the problems alone or with other students. The teacher gives them the necessary information (verbally, texts etc) and the students solve the problem with their newly-learnt knowledge.
=> Development of action-related competence with the aim of guiding students towards life-long, self-guided study.

Fig. 3a: Transmitting competence

Learning takes place in an interdisciplinary context and on the basis of problem-solving, with the use of learning segments featuring authentic tasks or exercises that come from the reality of life or work. The authentic tasks can be simple problems such as a small case study or they can be more demanding, depending on the learning goals and the amount of time available.

The exact skills that are required of the students should be used to solve real-life authentic problems in class. If students confront authentic tasks that demand a particular set of skills each time, they can make generalisations and are better equipped to understand problems out of context, or to confront unfamiliar tasks or problems if they come across them in their professional or private lives.

In summary: The education mandate that is enshrined in law and the curriculum make clear that a school's goal and that of teachers is to transmit knowledge and skills, but also to ensure that students are qualified to manage their private lives, as well as their lives in society.

In secondary technical schools, there is the added fact that students have to be prepared for a profession. In class, students tackle authentic, real-life problems to practise problem-solving and action, as well as to learn how to cooperate with fellow students in groups. The following skills should be taught: Specialist knowledge, method-related competence and social competence.

1.3 Overview: Lesson planning in three steps

Developing the considerations about the "What?" and "How?" of teaching, planning should take place according to the following three steps:

- **"Worthwhile questions" for preliminary consideration.** It is not very promising to begin planning directly without thinking about the framework, or the conditions, in which the classes will take place. This part of the chapter will introduce an appropriate catalogue of questions.
- **Setting goals:** Successful lessons are structured. You will find possibilities for ensuring this in this chapter.
- **Planning the procedure:** "Who does what, how, why, with whom and how can we make sure it has been learnt by the students?" This third step is about concrete lesson planning - how to plan a lesson step by step.

I. Worthwhile questions

The following catalogue of questions is a synthesis of different approaches to lesson planning. Some questions might seem obvious but it is important to clarify them before planning lessons. Often, it is these aspects in particular that are responsible for whether a lesson succeeds or not.

Please note:

- The order of questions is not strict.
- Choose those questions which make sense to you - not all of them are relevant to a particular subject or need to be answered.
- The questions can be relevant to a single hour-long lesson or to one lasting several hours. It takes time to answer questions in detail and therefore it cannot always be done in one single lesson.
- The aim is to reflect a lesson's subject matter as widely as possible and from different points of view, so some of the questions might be redundant.

An overview of worthwhile questions

1. What is in the curriculum?
2. When and where is the class taking place? How big is it?
3. What is important for the class at the moment?
4. What can be said about the individual students?
5. What is my own relationship to the subject/topic?
6. What are the possibilities for integrating the students' living and thinking environments?
7. What does the latest specialist literature say about the subject?
8. Which ethical, or "educational", dimensions does the subject have?
9. What should be learnt? Knowledge-Skills-Competence?
10. What do the students bring to the class in terms of prior knowledge?

Questions about institutional requirements and general conditions in the school

1. What is in the curriculum?
   - In what kind of school is the class taking place? For what profession?

2. When and where is the class taking place? How big is the class?
   - At what time is the class taking place? What comes before? The students' mental and physical state will be dependent on this...
   - How many students are in the class and what are the seating arrangements like? The answer to this question might exclude certain forms of teaching or at least imply that more effort could be needed.

Questions about the class and about the individual students

3. What is important in the class at the moment?
   - Are there groups or odd-ones-out?
   - How does the class deal with success and failure? What prior experiences does the class have of the subject? What kind of experiences do the students have with learning generally?
   - What are the students interested in? How can this be combined with the material?
4. What can be said about the individual students?
   - Are there relevant aspects in terms of development and psychology?
   - Does gender play a role regarding this subject?
   - What social environment are the students from?
   - ...

Questions on the relevance of the subject

5. What relationship do you have to the subject or topic as a teacher?
   - Which of your own experiences can you bring in to make the lessons clearer?
   - What emotional relationship do you have to the subject? Some subjects/topics will be more inspiring to you than others. You can probably deal with this better if you are aware of this.

6. What are the possibilities for connecting the contents of your classes to the students' living and thinking environments?
   - What is currently happening in politics or in the media that is related to the subject?
   - What significance does the subject have for your students? What should it have in your opinion?

- What significance will the subject have in future for your students (e.g. at work, privately, as a citizen of the state...)?
- What visual or audio aids are there for transmitting the facts about this subject?

Questions about the subject itself

7. What does the specialist literature say about the subject?

8. What ethical or "educational" dimensions does the subject have?
   - Are there attitudes that could be connected to the subject?
   - Is there a way of connecting educational concerns, in the sense of the education mandate, to the subject?

9. What has to be learnt? A competence analysis according to contents and proficiency
   - What terminology has to be understood and which facts have to be known? What is the minimum that the students should *know* at the end?
   - What are the minimum requirements of routines or subject-related tasks that students should be able to *do*?

10. What do the students bring with them in terms of knowledge?
    - How much prior knowledge can be assumed? Which part of it do I want to ascertain and how?

II. Learning goals

Meaning and legitimation of learning goals

"If you're not sure where you're going, you're liable to end up someplace else." (Robert Mager, cited by Kliemann (1997), p. 151.)

- Learning goals describe as concrete and observable as possible what the teacher's goals are in a particular lesson.
- They are also an indispensable precondition for well-planned lessons because the sequence of learning goals reflects the class' inner structure.
- There are different notions for formulating learning goals in education studies.

- Taxonomies classify learning goals on particular scales from simple to demanding, low to high.
- The fact that these taxonomies depict different levels makes them a good basis for developing tasks. Simple, intermediate and difficult tasks can be set with the help of such taxonomies of learning goals. Thus, learners can be given tasks of varying difficulty - making sure that each student is pushed according to individual ability.
- The *cognitive* learning goals in the taxonomy of Anderson / Krathwohl (2001) are presented below.

The classification of learning goals

The significant difference between learning goals is that they can be categorised according to cognitive, affective and psychomotor factors.

Cognitive learning goals are linked to intellectual processes such as knowledge, perception, acknowledgement, thought, opinion, judgement and justification. For example, if a student has problems with spelling this is linked to the cognitive domain.

Affective learning goals are linked to feelings, emotions, attitude, recognition or esteem. If a student seems bored for example, this has to do with his attitude, i.e. with the affective domain.

Psychomotor learning goals are to do with dexterity. For example, writing or typing, playing ball, dancing or playing a musical instrument.

None of these behavioural domains should be seen as being isolated from another, yet it often does make sense to analyse them separately. In the 1950s, experts started developing taxonomies of learning goals so they could measure performance. Learning goals were divided into the three domains mentioned above.

This is how the taxonomies or classification schemes, for the cognitive domain (e.g. Bloom, Engelhart, Furst, Hill & Krathwohl, 1956) and the affective domain (e.g. Krathwohl, Bloom & Masia, 1964) were developed. Similar taxonomies for the psychomotor domain emerged later. Each of these taxonomies classifies learning goals hierarchically, proceeding from the simplest functions of behaviour, thought, feeling or movement to those that are more complex.

The taxonomy of learning goals according to Anderson and Krathwohl (2001)

One of the most famous taxonomies for cognitive learning goals is Bloom's. His colleagues Anderson and Krathwohl developed it further (Anderson & Krathwohl 2001).

Their model contains two aspects that are explained below:

1. A taxonomy in the more narrow sense, beginning with simply structured mental processes (e.g. "to recite something from memory") and becoming increasingly complex (e.g. "to deduce something from a text")

2. The difference is based on the notion that to know "that" demands a different thought process from that of knowing "how".

The following table describes the taxonomy's different individual steps.

Step	Keywords and operators	Examples
Step I: **Remembering** Calling up important knowledge from memory	identify, call up, say, name, reproduce, list, repeat, explain...	• Mark the isosceles triangle on the worksheet. • Name the chemical formula for hydrochloric acid.
Step II: **Understanding** Recognise/explain significance/relevance of knowledge	paraphrase, clarify, present, translate, illustrate, classify, argue, adapt, explain, describe, elucidate, discuss, compare ...	• Draw a parallelogram. • Write a heading for the text. • Explain why a heart can be compared to a pump.
Step III: **Application** Apply what has been learnt to new situations	demonstrate, implement, grasp, solve, transform, predict, modify, operate, use, conduct, carry out...	• Correct the mistake in the following sentence. • Conduct the following experiment: ...

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Step	Keywords and operators	Examples
Step IV: **Analysis** To decompose material into its constituent elements and define their relationship in a hierarchical structure	differentiate, characterise, select, organise, structure...	• Sort out the terms in a table and formulate appropriate headings. • Read the politician's campaign text and figure out what his political viewpoint is.
Step V: **Assessment** Pass judgment on the basis of criteria and standards	check, match, transmit, test, monitor, judge, evaluate, assess, criticise, estimate ...	• Use the box to assess the presentation. • Assess how convincing the arguments for and against astrology are.
Step VI: **(Re)create** bring elements together to create a coherent, functioning whole	plan, create, design, discover, produce, construct ...	• Design a questionnaire on the subject of eating habits. • Write a plan of measures to reduce our school's energy consumption.

Fig. 4. Source in German: ThILLM-Hefte 126 „Gehirngerechtes Klassenzimmer": Unterrichtsplanung mit Hilfe von Lernzieltaxonomien, p. 30, http://www.hum.tsn.at/cms/upload/pdf/2011/Unterrichtsplanung_mit_Lerntaxonomien.pdf (22.11.11).

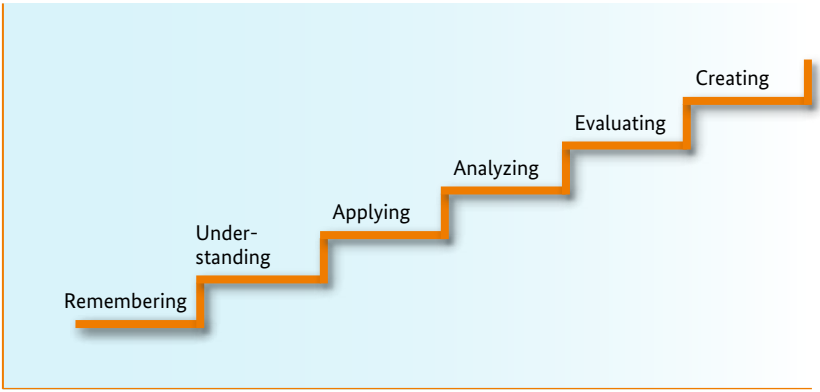


Fig. 5: Adopted from a German graph. ThILLM-Hefte 126 „Gehirngerechtes Klassenzimmer": Unterrichtsplanung mit Hilfe von Lernzieltaxonomien, p. 27. http://www.hum.tsn.at/cms/upload/pdf/2011/Unterrichtsplanung_mit_Lerntaxonomien.pdf (22.11.11).

Dimension of knowledge	Sub-categories
Knowledge of facts: Basic knowledge needed to be familiar with a discipline and to be able to solve problems related to it	• Knowledge of terminology (e.g. ability to define a term) • Knowledge of specific details and elements (e.g. to be able to relate the features of a fable)
Knowledge of concepts: Knowledge about the relationships between the individual elements of basic knowledge within a greater context that ensures that there is joint functioning.	• Knowledge of the classifications and categories (e.g. of the different geological eras) • Knowledge of the principles and generalisations (e.g. theorems and laws) • Knowledge of the theories, models and structures (e.g. theory of evolution)
Knowledge of processes: Knowledge about how something is done, about research methods, about criteria for applying skills, algorithms, techniques and methods.	• Knowledge of subject-related skills and algorithms (e.g. to solve a quadratic equation) • Knowledge of subject-related techniques and methods (e.g. about the interpretation of a literary text) • Knowledge of the criteria for applying particular processes (e.g. which methods should be used to visualise information in a text)
Metacognitive knowledge: General knowledge about the learning process as well as awareness and understanding of personal growth regarding knowledge	• Strategic knowledge (e.g. about problem-solving strategies, about planning, guiding and correcting one's own learning process) • Knowledge about one's own strengths and weaknesses

Fig. 6: Source in German ThILLM-Hefte 126 „Gehirngerechtes Klassenzimmer": Unterrichtsplanung mit Hilfe von Lernzieltaxonomien, p. 27. http://www.hum.tsn.at/cms/upload/pdf/2011/Unterrichtsplanung_mit_Lerntaxonomien.pdf (22.11.11).

Synthesis: The linking of learning goals and forms of knowledge

The different levels of taxonomy can be categorised into different forms of knowledge:

Dimension of the cognitive process	Remember	Understand	Apply	Analyse	Assess	Create
Declarative knowledge						
Conceptual knowledge						
Procedural knowledge						
Metacognitive knowledge						

Fig. 7: Source in German ThILLM-Hefte 126 „Gehirngerechtes Klassenzimmer": Unterrichtsplanung mit Hilfe von Lernzieltaxonomien, p. 27. http://www.hum.tsn.at/cms/upload/pdf/2011/Unterrichtsplanung_mit_Lerntaxonomien.pdf (22.11.11).

Affective learning goals according to Krathwohl

The taxonomy of the learning goals for the affective domain was developed from Krathwohl, Bloom & Masia's (1975) taxonomy of learning goals in the cognitive domain. It also has a hierarchical structure based on the process of interiorising information, i.e. the process of a person's inner growth, which culminates with the development of a personal philosophy of life. The higher an individual can be classified in this taxonomy, in terms of the learning goals he has achieved, the more he can be described as a personality.

These are learning goals that place an emphasis on feelings, emotions or a certain amount of attraction or aversion. Affective learning goals range from simple disdain of certain phenomena to complex, but consistent qualities of character and consciousness. In the literature, such learning goals are depicted as interests, attitudes, appreciation, values or emotional behaviour. The taxonomy looks like this:

1. **Becoming aware, observing** – Something enters the consciousness (e.g. an ethics-related business problem or the fact that a particular literary work exists)
2. **Reaction** – A stimulus is reacted to subconsciously (e.g. develop readiness to come to terms with an ethics-related business problem or to read a literary work)
3. **Evaluation** (e.g. to form a position about an ethics-related business problem or to find a literary work provocative)
4. **Structured structure of a value system** To form an attitude on the basis of a problem that can then be applied to other contexts.
5. **To be fulfilled by a value or a system of values** – Actual behavioural changes (e.g. to choose to tackle other ethics-related business questions)

Psychomotor learning goals according to Bloom

Learning goals in the psychomotor domain describe physical or motor skills. They are ordered hierarchically into five categories.

1. Imitation
A subject is animated to imitate a particular behaviour through observation.

2. Manipulation
The following of instructions leads to skills being further developed and behaviour being applied selectively.

3. Precision
The learner refines his skills and uses his own measurements.

4. Articulation
Several actions are coordinated, which calls for advanced coordination skills that need to be integrated in harmony.

5. Naturalisation
Behaviour becomes intuitive and no longer needs to be thought about.

Formulating learning goals

The more clearly and more observably learning goals are described, the more precisely they can be formulated. Formulation can give information about:

- the contents of a class
- the conditions under which a learning goal has to be reached
- learning behaviour

If a learning goal is identified precisely, it makes it easier to monitor whether students have reached it because the form of monitoring is already clear in the formulation.

Examples for learning goals with learning goal components	
Students should...	
be able to explain the term “contract” without learning aids	= Action = Content = Condition
be able to name the components of a contract of purchase from memory	= Action = Content = Condition
be able to assess the validity of a contract with the help of the written legislation	= Action = Content = Condition

Fig.8 : Learning goals with learning goal components

Examples of imprecise and precise verbs in the formulation of learning goals

Examples of imprecise verbs which should be avoided when describing learning action (not directly observable):	Examples of precise verbs which can be used when describing learning action (directly observable):
know	recite from memory
be familiar with	enumerate
understand	differentiate (only precise in context)
believe	explain (only precise in context)
	calculate
	oppose (only precise in context)
It is impossible to assess what has been learnt	It is possible to assess what has been learnt

Fig. 9: Verbs in the formulation of learning goals

”Operators”: The formulation of learning goals helps to set tasks

The above-mentioned verbs which are used in the formulation of learning goals are called “operators”. They are ideal for setting tasks in both written and verbal form.

III. Who does what, when, how, why and how can we make sure it has been learned?

How to use this chapter

Now we move onto concrete lesson planning. There is plenty of material available in the appendix. So that you have rapid access, there are numerous short overviews that present the methods you can use for various purposes. There are more detailed explanations further on in this chapter.

From the goal to the lesson

The further planning is based on the learning goals for the class. Goals could change during this process but nonetheless it makes sense to begin with them.

The following questions can help to explain how you should plan according to the goals. It makes sense to work through the questions in the given order because this is efficient when it comes to preparation time. Moreover, the answers to a later question could change the results of earlier reflections because there is some interdependency. The "Berlin Model" was a significant inspiration.

1. How can the lesson's main idea be summarised in one sentence? What phases should the lesson be divided into?
   - This sentence helps to plan stringently! A lesson can have the following example structure: "At the end of the lesson, the students have to have mastered XYZ. In order to do that they must know XYZ and know how to differentiate this from XYZ and then they can derive a goal that can be practiced in another context."
   - If you're not able to sketch out your goals in this way then you can't expect the class to follow you regardless of your efforts.

2. What form of student grouping is appropriate in what phase? Should students work alone (individual work), in pairs (partner work) or as a group? The following reflections make sense in this context:

- Is this a lesson for recapitulating information? Then perhaps individual work is better.
- Does it make sense for students to exchange views with their neighbours about a task? Then partner work might be best.

3. What methods are appropriate in each case?
   The method is the way that a lesson is organised. This is closely linked to the student grouping question. Examples of methods are listed below (they are explained in more detail in the appendix)
   - Lecture
   - Teacher demonstration, e.g. according to a model
   - Exploration by asking-developing method
   - Role-play
   - Case studies
   - Experiments
   - Working on a text, text method
   - Construction tasks
   - Refining tasks
   - Project
   - Technical analysis
   - Study of technique
   - Product testing...

The following lines of thought can be helpful here:

- Does it make sense to explain something on the basis of expert knowledge? Then a lecture by the teacher might make sense.
- Is it important that the students enter into an extensive discussion with each other? Then it might make sense to introduce a game that ensures as many as people as possible will take part.
- Is there a lot of information that the class has to obtain from texts, pictures etc. and can it be divided equally? Then perhaps a group puzzle (Jigsaw technique) would make sense.

4. What multimedia resources are appropriate? Multimedia should never be used as an end in itself and should never (as is often the case) be the starting point of lesson planning.
   - Multimedia resources can help to provide an orientation based on living environment because they make it clear to what extent the subject is or could become important for the students.

- Is it important that the class perceives a particular living environment? Then a film might make sense.
- Is it important that the class be provoked into having a debate? Then a provocative quotation written on the board might make sense.

5. What is an appropriate warm-up or introduction to the class?

- The introduction should make very clear the aims and uses of the lesson.
- It also has other possible functions (e.g. activation, disciplining)

There is more detail below.

6. Once you have worked through these questions, it makes sense to look at a few more.
   - How much time do you need and does this seem appropriate? If not, then you need to think twice about your methods or multimedia.
   - How are you ensuring there is enough time for contemplation? It is not enough to just "do" things but it is important to do them consciously (procedural knowledge and metacognitive knowledge)
   - How are you ensuring there are results? It is not enough to just repeat things but they have to be retained in a sensible way. This of course depends on the goals. If you are interested in the thought process more than in a contents-based example this weighting has to be reflected in the student's book.
   - How can you make sure that all individual needs are met? Are there extra tasks for those who are faster? Is there a possibility to let the class choose between two approaches?

1.4 Warming up

The warm-up or introduction should be motivating and should also make clear the aims and methods to be used

Would you visit a lecture enthusiastically if you didn't know the lecturer, if you didn't know the subject of the lecture, and if you didn't know whether the information could be of importance to you?

Probably not - yet teachers often expect their students to come to class without telling them what the information might bring them.

Jochen and Monika Grell have developed a counter-model to the informative warm-up session that

- enables teachers to begin lessons in a clear and motivating way
- helps to give a structure to the teaching
- unburdens the teacher because it is easy to use
- forces teachers to reflect upon the efficiency of their preparation.

The warm-up session should give students room for orientation, it

- informs them about the subject and goals of the lesson.
- justifies why this subject and the goals are important
- explains what teaching methods will be used
- asks for a confirmation that these methods are acceptable or discusses alternatives if necessary.

Beneficial side effects - what else needs to be taken into account?

The warm-up session is of course also a ritual which is important in different ways:

- It can discipline the class and help them warm up before the learning begins in earnest.
- On a relational level, it says: "I am glad that we're now having this lesson all together and that you can learn something today that could be meaningful to you."

The following aspects can be taken into account when you formulate and plan your lesson:

- The warm-up should make a connection to what the students have previously learnt ("You know this already and today we're going to add this...")
- It should also look at the class' language, ideas and attitudes and try to understand the students' logic of action (Meyer)
- The main goal of the warm-up session is to provide students with a chance to appropriate the lesson's subject.

The idea that it's all about packaging

Often the opinion is expressed that the warm up should awaken students' curiosity and motivation will be aroused by offering them something vibrant, original and relevant to them. Often films that teachers have shot themselves are shown, or role-play situations performed or poems recited etc.

1.5 Overview: Basic formulas

Of course, there are thought structures and also planning structures that have proven themselves and are often repeated. You will also surely develop structures for yourselves that are appropriate to your subjects. An overview follows:

Basic formula 1: Learning and practising facts, rules and laws

- Cognitive contents
- This is about learning, understanding and applying something.
- At the end, there is a review and perhaps a transfer.

Basic formula 2: *Solving* problems. Focus on proper solution.

- There is a tricky problem at the beginning.
- A solution has to be found through reflection and calculation.
- At the end, there might be a transfer to a similar problem.

Basic formula 3: Discussing problems

- There's an open question at the beginning.
- The aim is to introduce a controversial issue and enabling a discussion.
- At the end, there is consensus or a variety of opinions.

Basic formula 4: Coming to terms with something

- At the beginning learners are confronted with an opinion, an artwork, text etc...
- This is about examining one's own position.
- At the end, "sharing" is on the agenda and the results are shared among the whole group of learners.

Basic formula 5: Researching and presentation

- At the beginning a problem is being defined.
- It is researched and then presented.
- The results are evaluated.

In Part 2 of the appendix you will find a few basic formulas for how a lesson can unfold that you can use as possible starting points for your planning. Methods, student grouping etc. are recommended there.

1.6 Teaching methods and student grouping

1.6.1 Teaching methods

Teaching methods help the teacher to transmit information in a comprehensible and appropriate way. Methods describe the way that material can be imparted. The material or the subject characterises the "What" of the lesson ("What is being taught?") while the methods describe the "How" ("How is something being taught?").

Teaching methods can be categorised according to different aspects:

a) their function in the imparting and appropriation of knowledge process

- To introduce a subject
- To consolidate what has been learnt
- For practice
- To assess performance after the lesson.

b) teacher-centred methods versus student-centred methods

Teacher activity:	Class method	Student activity:
	Lecture	
Presenting - giving		Taking – receiving
	Class discussion	
Questioning - exploring		Finding – involved
	Project	
Observing - helping up		Doing – working

Fig. 10: Teacher-centred methods versus student-centred methods

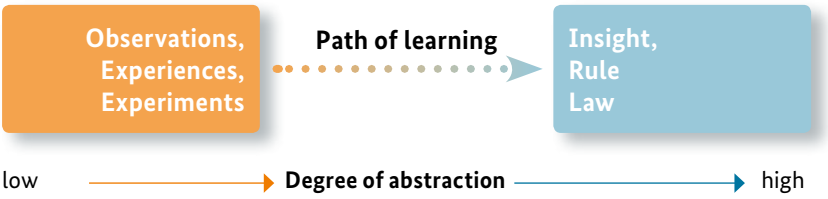
c) the procedure by which knowledge is acquired: Deductive, inductive, systemising, analytical methods.

The way that knowledge is acquired is described as a method or procedure (teaching procedure). There are different ways of approaching a new subject. A teacher can present a theory and then use concrete examples from reality to elucidate it or he can first provide a concrete example and deduce a rule from it. The first approach is inductive, the reverse is deductive and the two can be combined. Systemising and analytical procedures can also be used in class.

Inductive approach:

- This is the most common approach for transmitting knowledge in a professional context.
- This corresponds to the natural learning process, leading from the concrete to the abstract.
- A rule or principle is deduced from a number of observations and experiments.
- **At the beginning**, there is a concrete example, event or model (**concrete**, lower degree of abstraction)
- **At the end** of the learning process there is an insight, a rule or a **law** (**higher degree of abstraction**)

Example: Ohm's law was calculated on the basis of experiments that delivered corresponding measurements, voltage values + current and resistance.

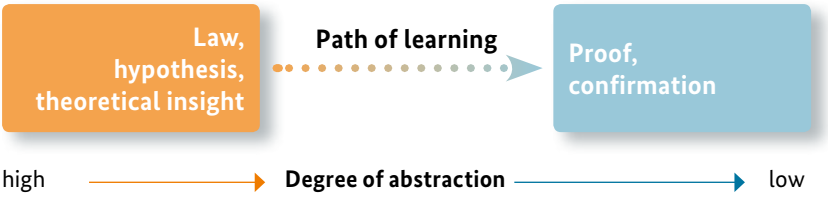


Deductive approach

This approach is the **opposite of the inductive method**, i.e. one begins with the **abstract and goes to the concrete**. This is appropriate for simple rules and laws because it prevents students from being overtaxed.

The students know the **rules**, or they are presented by the teacher and **applications** are then derived. The theory is tested and proven by experiments.

Deductive approach:



Example: The teacher establishes the hypothesis that protein coagulates when confronted with acid, heat or mechanical treatment. He proves this by conducting experiments using egg white and lemon juice, vinegar, heat and by beating the egg.

Inductive and deductive methods can be combined with one another.

Since students often have prior knowledge from on-the-job training or theory classes about certain facts, this can be proven or confirmed in a practical class.

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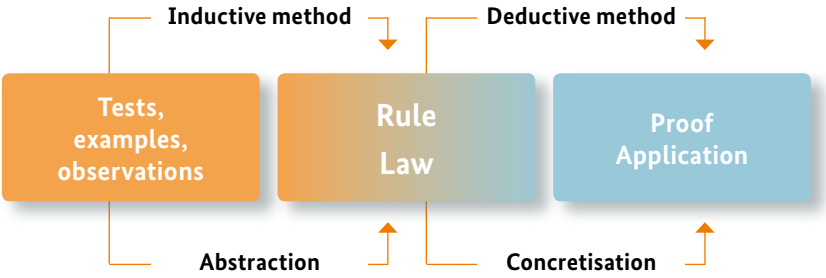
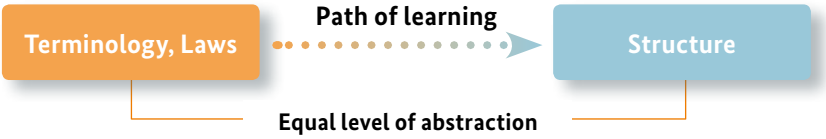
The combination of inductive and deductive approaches



Systemising approach

When a teacher presents facts, students can collect and classify them according to certain criteria (with the teacher's help if necessary). The individual elements are systemised, i.e. structured. What is important is that the students are able to base their work on sufficient prior knowledge from a theory class or from their on-the-job training.

Systemising approach

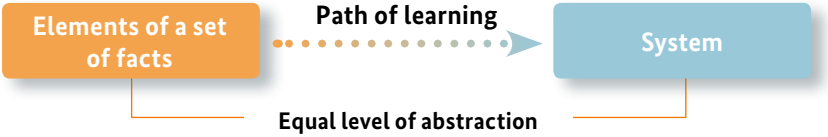


Example: The foundations of hygiene regulations are explained by reading the legal texts. Students collect examples of the law being applied in practice and classify them into categories such as staff hygiene, factory hygiene, hygiene in establishments, rooms etc.

Analytical approach

A set of complex facts is dismantled into individual elements via an experiment, a diagram or a flowchart. The subsequent analysis leads to a corresponding insight, e.g. critical points in the production process. The teacher can provide students with help but not with the answers. The aim is for students to analyse and summarise the facts independently.

Analytical approach:



Example: A complex production process is deconstructed into single steps which are then examined in greater detail, e.g. food production from the choice of raw materials to the finished product.

1.6.2 Student grouping

Student grouping is about how a class is organised and whether students interact with the teacher or mainly with the other students. There are four categories.

Social grouping – different ways of interaction in class	Direct instruction
	Individual work
	Partner work
	Group work

Fig. 11: Student grouping

Within one lesson or teaching unit different forms of social grouping might be used depending on the learning goal or teaching method. Direct instruction is often used if the aim is for students to learn new material, whereas individual work makes sense if students want to ensure that they have understood. For example, they might solve a series of maths exercises after learning a set of rules.

Methods that are often used in class:

Method: Exploration by questions

Class discussion (CD) and exploration by questions (EQ)

Teachers ask questions, the class answers and at the end, students understand something that the teacher already knew and they can write this in their books. This method is often criticised in educational circles, although it remains one of the most popular teaching instruments. In order to use it accurately, it makes sense to differentiate between different basic forms.

1. High-frequency question and answer session - not a discussion but questions asked about certain contents (e.g. homework)
2. Teacher-student discussion: More complex contents such as factual contexts are developed in a discussion and the teacher plays an important guiding role.
3. Discussions between students: The teacher moderates the discussion that the students hold.

It is possible to use this method sensibly in almost all teaching phases, for example when introducing a new subject area and activating students' prior knowledge, when structuring learnt information or when repeating and summarising learnt material.

The method has certain **advantages** which explain its dominance in education (Orth 2000, p. 15)

- Teachers can conduct lessons purposefully and bring them forward fast
- It helps avoid students from "barking up the wrong tree" or using the wrong approach and therefore wasting time...
- Teachers can find out immediately whether students are following
- Students can get involved in the lesson relatively easily
- The guided discussion helps students to think and learn ways of processing and rational penetration

But the fact that the teachers play a strong guiding role also leads to **undesired effects** (according to Orth 2000)

- Students are forced to follow the teacher's line of thought, real independent thought is not possible.
- It is difficult to make learning material emotionally accessible.
- What is learnt in the question and answer session is quickly forgotten.

Instructions for implementing this method can be found in the appendix (p. 115).

Method: The lecture

There are always phases in class in which a teacher has to explain (complex) material. Explanations can be based on specialist knowledge but can also be transmitted via methods (e.g. group puzzles/jigsaw technique) or other forms of work (independent learning). Dubs (1994, p. 156) uses Henson (1988) and Good/Brophy (1994) to point out the following situations in which a lecture or the provision of information by the teacher are justified:

- When knowledge that will later be used more actively in a larger context has to be imparted.
- When this knowledge is not easily accessible (e.g. cannot be read about in a textbook or learnt about independently in a computer-supported class)
- When the knowledge has to be used for a particular goal and thus be available in a certain form (for example when information from different areas is needed to solve a particular problem).
- When the teacher wants to use his personal influence to motivate the students.
- When an overview has to be given so that the students can later cope with independent learning.
- When the teacher wants to use part of the contents as a basis for further learning and further provision of knowledge by a particular point in time.
- When prior teaching material that needs to be adapted to the current situation exists.
- When teachers want to create conditions for a class discussion.
- When the teacher has to explain certain contexts that the students did not understand on their own.

Instructions for implementing this method can be found in the appendix.

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Other teaching methods

The teaching methods introduced below are also presented in more detail in the appendix.

Methods for finding out about students' prior knowledge and opinions	
Brainstorming	Students collect their ideas about a subject. These are categorised and then the results are looked at. Moderation cards can be used to make the collection. Please note: It is not very efficient to carry out a brainstorming session with the whole class.
Photo association	Students are shown (a) photograph/-s and then asked to express their opinion about something or attitude towards it.
One point question/My standpoint	A line is drawn on a board or a poster and two extremes are presented. The students use stickers to indicate their opinion, attitudes. It can also be used to find out what opinions the class members hold ("Those who agree, go to the right…" Afterwards, there is a debate or suggestions for action.
Avalanche	Students are given a question that can lead to a debate. To begin with, they each write down individually three points they think are important, then they work in pairs to discuss the most important three points and then in fours to eventually decide on three important points.
Written conversation	Each small group (max. five people) is given a sheet of paper on which a question or a theory is written. Students write their opinions or ideas on the sheet, pass it around in the group and comment on what the others have written too.

Methods for exploring new material	
Q&A session	Students formulate questions on a given subject with the help of documents. They are then answered in a plenary session or by other groups.

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Methods for exploring new material	
Headstand method	A subject is introduced and students are given the task of recommending measures so that a cause goes completely haywire. ("What should the state do to make the crime rate rise?") The suggestions can then be turned around in order to come back to a desired situation. This is a good method for unleashing creativity.

Methods for repeating and ensuring results	
ABC-method	Students should develop a discussion on a subject using as many letters of the alphabet as possible as the first letters of words describing various aspects of the subject. They should start working on their own and results should be collected as a group.
Carrousel or ball-bearings — discussion	The class is divided into two groups. The first group forms an inner circle, the second an outer circle. Participants sit opposite each other and face each other. They receive a set of questions and discuss the first one for a few minutes. When the teacher makes a signal, the people in the outer circle move one seat further and the new pair discusses the next question.
Mind mapping	Ideas are collected in a structured manner - this lends itself better to groups than to the whole class.
Role-play	There is a wide range of role plays, from ones that are based on texts and sometimes limited to those which are completely free. Role-play cards can be useful.
Method 66 (Bee-hive method)	Participants form groups of 6, which each receive a precise task to carry out on the basis of taught information. They have six minutes to discuss their ideas which are then presented to the class as a whole.

Details on these methods and instructions on how they should be implemented are in the appendix (p. 115)

1.7 Multimedia resources in class

Multimedia resources have an important function for learning. Including them can motivate students to deal with the material to be learned. A picture, for example, might make a topic more accessible. They can thus learn with all the senses – sound, sight, touch, smell and taste. Multimedia can be used to appeal to one or more of the students' senses and encourage learning. It can also help students to remember what they have learnt.

Different uses of multimedia and their function in the learning process are presented below.

Overview of multimedia

Lessons that are only based upon language - spoken or written words - are unilateral and only encourage students to a certain degree. They demand higher concentration levels from students and offer little variety. Multimedia can support the learning process by imparting information, insights and findings. For example, if students have to find out how an engine works then this can be shown via a film or a mechanical model. The film can depict certain aspects in slow-motion or be rewound if necessary and a model can be touched and moved by the students themselves. Both have their advantages. A teacher can decide which resources to use to put information into context in the most efficient way for the students.

Overview of the use of multimedia resources in class

1) Symbolic documents
- Texts of all kinds, textbooks, specialist literature, dictionaries, newspapers, work orders, figures, symbols

2) Visual documents
- Sketches, drawings, diagrams
- OHP transparencies
- Maps
- Diagrams, photos
- Pictures

3) Audio documents
- Radio programmes
- Sound recordings or MP3s

4) Audio and visual documents
- Video recordings
- Films

5) Electronic media
- Computers
- Internet
- Email and other interactive means of communication

6) Objects
- real objects, e.g. rocks, different building materials, types of wood, models, e.g. an engine model

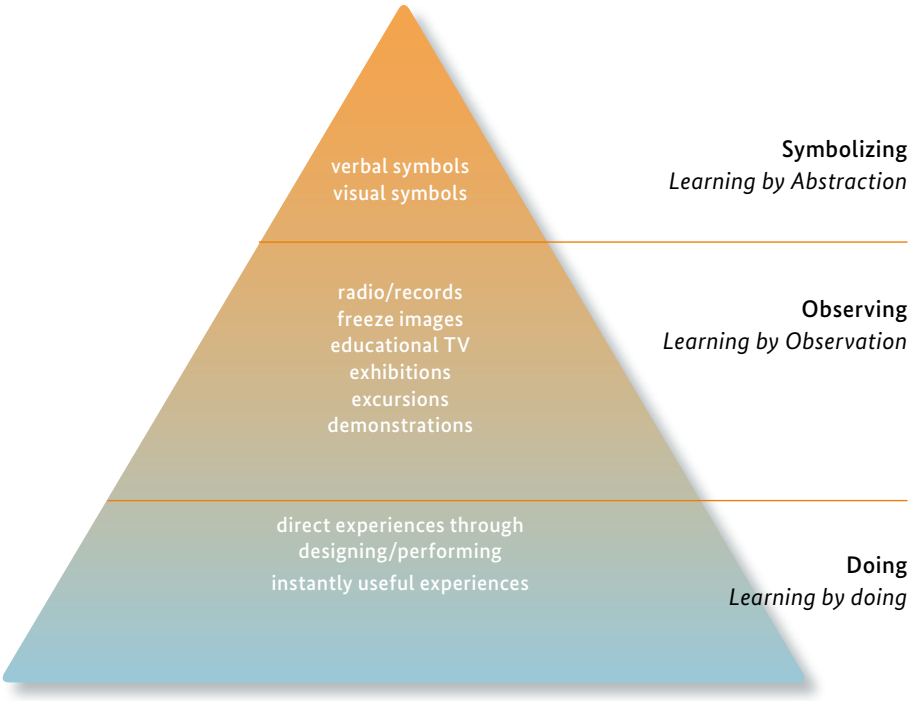
7) Equipment
- Writing instruments
- Tools
- Magnifying glasses, microscopes, laboratory kits
- Instruments

8) Material
- Paper, notebooks, paint, wood, metal, food

The significance and function of multimedia resources for the learning process

Multimedia resources should support teachers by creating a connection between students and the material as well as creating a link to reality. The use of multimedia to present the material can be more or less anchored in reality.

Edgar Dale, an American educationist, categorised different audio-visual materials according to how clear they were and into three relevant learner activities - learning by abstraction, learning by observation and learning by doing. He published his Cone of Experience in 1954.



Figures 12:
Dale's Cone of Experience, Source: http://de.wikiversity.org/wiki/Datei:Dalekegel.png, as at 29.07.2014

In Dale's Cone of Experience, everything that is written and spoken in class is categorised at the top. Little experience can be made with verbal and visual symbols. In the middle area of the cone is observation, which can be encouraged in class with the help of different resources. Real or direct experience has the highest experience value, i.e. learners really only undergo an experience when they can do things on their own.

With the use of such resources, learned material can be consolidated and new experiences made so that the new knowledge can be summoned at a later point in time. The media are thus the transmitters of class contents and can motivate, inform, guide activity, give feedback and measure success.

Depending on the learning goal, media can have different **functions in the learning process:**

- They can transmit knowledge
- They can make clear connections
- They can enable performance transfer
- They can analyse and compare complicated structures
- They can evaluate and judge facts

Media can also:

- Draw attention to particular events
- Trigger emotions
- Provoke reactions
- Establish norms and moral concepts
- Encourage imitation
- Trigger the interiorisation of behaviours

With the use of different media, students can be motivated to learn better. Media can address different sensory channels - sight, sound, touch, smell and taste. A combination of different senses can lead to a better understanding of facts thanks to the use of media (e.g. film: sight and sound, work with a model or on a machine: sight, touch by using the machine oneself)

Designing and using multimedia resources

Media should have an impact on the learning process and this has to be taken into account when making a lesson plan. The use of media is supposed to ease learning by guiding attention and perception and avoiding distraction as far as possible. Both the structure as well as the individual elements should be taken into account by the lesson plan and a strategy should be developed to steer attention and perception.

Basic rules of structuring

1. There should not be too much information.
2. Significant information has to be obvious.
3. Distractions should be avoided.
4. There should be a memorable order.

The way information is arranged on a board or on a worksheet is particularly important. You will find certain points to keep in mind below.

Interactive media

Interactive media are technical means of communication, which enable communication between people or people and media (e.g. with a computer-based learning program). Depending on the medium, there is more or less interactivity. With interactive media, a computer plays a special role as learning with computers is considered positively by many students. They particularly like two characteristics: The fact that a computer never loses its patience and that they never have to be ashamed of not knowing something or making mistakes with a computer. This brings relief to weaker students who need more time and space to recapitulate as well as more explanation and practice to understand information. Learning with a computer can also offer better opportunities to very talented students than learning jointly with their classmates. Learning software and learning platforms are being used in schools more and more.

The most commonly-used media in class:	
Information on the blackboard	A board can be used in different phases of the class, in the warm-up phase as well as for consolidating information or results (a structural picture emerges gradually). A board can re-emphasise the structure of content (learning aid).
Worksheet	Worksheets contain information and tasks on particular material and can be worked upon by students on their own. Worksheets can be used in every phase of the lesson. Information on a worksheet can develop material from the textbook. They can be used to process, repeat or consolidate information and ensure that it has been understood. Different visualisation techniques can be used which echo the structure of a subject area or logical relationships.

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The most commonly-used media in class:	
Film	Films can be used when they show something that students usually do not see (phenomena on the edge of society, foreign cultures...), or help them experience something that can trigger questions. They can be provocative and are good for introducing a unit or a sequence. It is also possible to use films at the end of a unit as a monitoring tool or if a transfer is needed to what has been learnt. What is important to note is that the time when a film is shown is very important and says a lot: If films are used as fillers before the holidays it will not come as a surprise if students refuse to do any work upon it after watching it.
OHP transparencies	It is faster to write on a transparency than on a blackboard, so this is appropriate for checking answers from a worksheet or collecting ideas.
Simulation/ Model	Simulations or models provide one of the most realistic ways of depicting real-life happenings or events. They are abstractions that can be experimented with or used to demonstrate. The results of an experiment using simulations or models lead to conclusions that can be applied to real situations.

Information on the board

Terminology: This is information that a teacher writes on the board.

Use: A board can be used in different phases of the lesson, in the warm-up phase as well as for consolidating information or results. A board can re-emphasise the structure of content (learning aid).

Depiction: Contents can be depicted in the form of:
- Keywords or texts to remember
- Mind-maps
- Diagrams
- Sketches
- Pictures
- Formulas or symbols

Form: Information on the board should be
- clear
- legible
- understandable
- visually attractive and it should have a heading

Use of colour: Colour should be used sparingly. Colour on a green board has different effects of contrast and a significant contrast is best. Legibility in the entire classroom is important.

Writing:

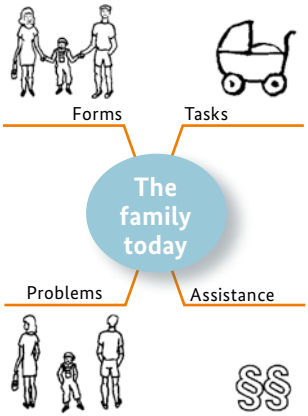
- Neat legible handwriting is better than printed letters
- Not too small, not too big
- Written closely together in blocks
- Both small and capital letters should be used (CAPITALS ONLY should be an exception)
- Highlighting with underlining, colour, bordering, dashes etc

What is the difference between well and badly presented information on a board?

Well-presented information on the board:

- → should have a theme as a heading
- → should have an ordered structure
- → should feature graphic elements so students can visualise
- → should not have too much text
- → should be a learning aid even out of lesson

An example for structure and openness:



Badly presented information on the board:

- → is written on a dirty background
- → is difficult to read
- → includes too many abstract signs
- → has too many abbreviations
- → is more complicated than it is helpful

Fig. 13: Source in German: from Mathes, W. (2004) "Methoden für den Unterricht", Schöningh Verlag, Paderborn.

Designing and creating worksheets

Worksheets contain information and tasks on particular material and students can work with them individually. Worksheets can be used in every phase of the lesson. Information on a worksheet can develop material from the textbook. They can be used to process, repeat or consolidate information and ensure that it has been understood.

Different visualisation techniques can be used that echo the structure of a subject area or logical relationships.

Before a worksheet is used, the teacher should think about its function. Sometimes it makes sense to use other media considering the fact that paper is sometimes overused. The frequent use of very similar worksheets can lead to confusion.

Certain aspects should be kept in mind when **designing worksheets**:
- Information about subject, class (English, space for the date), material or lesson should be named ("Telephoning: Worksheet 1").
- Clear structure, legibility.
- Concentration on one subject only.
- Attractive design, use of graphs and illustrations (if this helps clarification or motivation)
- Short, concrete tasks with clear instructions as to the work steps.
- Information on aids and time for carrying out tasks.

Formulation of tasks
Worksheets are different from information sheets in that they include work assignments /tasks and exercises.
- Clear and short instructions or questions (avoidance of question chains and repeated questions)
- The level of language should be appropriate for the class.

Example 1: Simple work assignment / simple task
"Read the text. Find arguments that are in favour of the foundation of a general partnership. Write them into the table below."

Example 2: A more detailed work assignment / task

Work assignment for Group 1

1. Read the additional information carefully!
2. Using the additional information, fill out the **right-hand column** of the overview on the second worksheet.
3. Copy your results onto the Metaplan cards that have been provided.

1.8 Creating a draft lesson plan

A draft lesson plan describes the students of the class and any preconditions, the material that needs to be taught, the skills to be acquired and the learning goals, the selected methods, grouping and resources, as well as how a lesson should unfold. This is described in the lesson plan with time slots for different phases and steps. The lesson plan should be structured as follows:

Didactic analysis

- Analysis of addresses
- Analysis of material
  - Orientation of material (specialist analysis according to the subject)
  - Structural analysis of material (didactic considerations, e.g. selection of material, access to material, subject-related didactic principles, examples, fundamental ideas, didactic reduction)
  - How the lesson unit and the depiction of the skills to be encouraged are embedded in the overall plan
- Competences
  - Areas of competence (specialist knowledge, methods, social and personal with nuances (according to the subject or curriculum) such as communicative competence, learning competence). The corresponding learning goals should be formulated within the areas of correspondence, as should the cognitive learning aims within a particular taxonomy.

  - Cognitive learning goals, according to Anderson & Krathwohl, 2001, with the possibility of developing certain forms of knowledge
  - If required: Affective learning goals
  - If required: Psychomotor learning goals
- Methodical planning (and organisational conditions) and choice of media resources
- Lesson plan

Example lesson plan

Lesson subject: _____Class:_____ Time: _____

Planned time	Learning goals	Contents	Methods / Student grouping	Resources & media

Fig 14: Example lesson plan

1.9 Summary of lesson planning

According to the considerations on which subjects should be taught, further planning should be divided into three steps.

1. "**Worthwhile questions**" as preparation: To start directly with the planning without thinking about the framework would not promise much success. This section presents a suitable catalogue of questions.
2. "**Setting goals**: Successful teaching is structured and focused on goals and you will find ways of achieving this in this chapter.
3. "**Planning**: "Who does what, when, with whom, how, why and how can we make sure it has been learnt?" The third step is about the concrete lesson plan, preparing a class step-by-step.

Steps of lesson planning		
1	Goals	→ Curriculum → Learning goals for the lesson
2	Preconditions of	→ Composition of the class: - Number of students - Previous schooling - Professions/Training courses - Students' motivation/participation
3	General conditions	→ Furnishing and equipment
4	Content	→ Which contents? → Amount of material to be taught? → Significance of the lesson's content for professional practice → Necessary (previous) knowledge of students → Order of the content taught (from the simple to the complex or vice versa, systematic, analytical etc.) → Visualisation (Transparencies/models)

continue next page

Steps of lesson planning		
5	Course of the lesson	→ Necessary (previous) knowledge of students → Order of the content taught (from the simple to the complex or vice versa, systematic, analytical etc.) → Visualisation (Transparencies/models)
		→ Warm-up / motivational phase / Setting the problem
		→ Formulate learning goals
		→ Choose teaching methods and student grouping (instruction followed by individual or group work)

Fig. 15: Steps of lesson planning according to the Berlin Model

2. Basics of the psychology of learning

Classes are supposed to encourage students to learn. Therefore, it makes sense for teachers to know the basics of the psychology of learning, pertaining to subjects such as memory, problem-solving and various learning theories, which are fundamental to action orientation (action theory). In the following, there will be information as to why what has been learnt is then forgotten again and notions on how learning material is stored in the brain. At the end of the chapter you will find a summary of the points teachers can keep in mind while planning their lessons so that students are able to learn as well as possible.

2.1 Learning and memory

One of the important aspects of learning is that knowledge has to be stored - people store knowledge in their memory.

The Multi Store Model of Memory

The Multi Store Model of Memory shows how information is detected and stored.

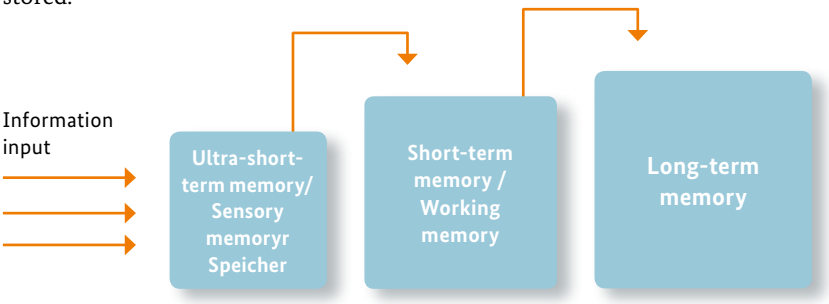


Fig. 16: The Multi Store Model of Memory

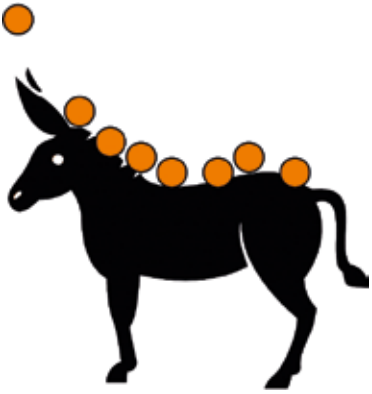
Ultra-short-term memory:

This is also called the sensory memory because the incoming stimuli are often perceived by the senses, not consciously. All sensory stimuli and information are stored. If a sensory stimulus (e.g. the impression that it is warm) or information is not significant for a person then it is not forwarded, and deleted. Visual stimuli or information are stored for about five seconds, whereas aural stimuli or information are stored for two seconds.

Short-term memory:

The short-term memory processes and categorises sensory stimuli or information. This is why it is also called working memory. This memory's capacities are limited. It can retain about seven pieces of information for about 20 seconds. If other pieces of information enter during this time, then the other pieces of knowledge will be deleted (see below).

The capacity of the short-term memory can be expanded if information is compressed and retained in what are known as chunks (e.g. AIDA = Attention, Interest, Desire, Action).



Long-term memory:

Information is stored in the long-term memory and called up as necessary. It can be retained for a long time to pass over from short-term to long-term, the information has to be of significance to the person and must have stayed a while in the short-term memory because it was repeated or processed ("Elaboration").

If information is stored in the long-term memory, it is not forgotten. Proof of how long information is stored is the fact that in many cases when people are hypnotised, they remember information that they would not necessarily recall in their conscious state (e.g. the food they ate at their 10th birthday party). Long-term memory can be compared to a huge library in which there are thousands of books in long corridors and whether they can be found depends on several factors. Is there a good classification system? Were some books put in the wrong place? Do the librarians know the library well? Was the search intensive or too quickly given up?

Calling up information requires information to be reconstructed, which means the working memory is also involved. Theoretically, the long-term memory can store an unlimited amount of information.

2.2 From knowledge acquisition to problem solving

It is not enough to retain and reproduce knowledge if one is to meet professional and social requirements. Acquired knowledge is the basis for carrying out actions and problem-solving. The basics of learning, regulating of actions and problem-solving strategies are presented below. They are all important for the learning processes of students.

2.2.1 Instrumental learning

Instrumental learning, which is also known as instrumental or operant conditioning, is about a change of behaviour and learning that is triggered when a stimulus is combined with a reaction. Particular stimuli-reaction models are derived from what originally seemed to be spontaneous behaviour. The frequency of behaviour can be changed in the long-term by its pleasant (appetitive) or unpleasant (aversive) consequences. In everyday language, it is known as "Learning by success" or "Learning by reward/punishment".

Research on these learning processes began with animals. The simplest example of operant conditioning is the rat in what became known as the Skinner box (after the psychologist who developed the theory of operant conditioning). This box is closed on all sides and has only a lever and a food tray. When a hungry rat is put in it for the first time, it reacts spontaneously, wandering around, exploring and sniffing until it (usually) presses the bar by accident. It might do this again and maybe again. This suggests that spontaneous behaviour occurs more frequently than operant conditioning. However, if a food pellet appears each time the rat presses the bar, then it is likely to press it over and over as soon as it understands that it will always be rewarded with food. The action is "reinforced" and the rat changes its behaviour, that is it presses the bar more frequently.

This model can be transferred to people. The likelihood of human behaviour is increased or reduced depending on whether it is rewarded (reinforced) or punished. If a student puts up her hand in class and the teacher praises her for the right answer, she is likely to put up her hand again.

Reinforcement is a key element in learning because behaviour that is reinforced gains strength. Every event that is proven to reinforce a reaction is called reinforcement and this can be positive or negative.

Positive reinforcement increases the likelihood of a type of behaviour, if it triggers a pleasant stimulus (e.g. acknowledgment, respect, food, money).

Negative reinforcement increases the likelihood of a type of behaviour if this prevents or stops an unpleasant stimulus from occurring (e.g. removing noise, bright light, heat or cold).

Positive punishment or Punishment 1 is the decrease of the likelihood of a behaviour occurring if this triggers an aversive reaction (e.g. noise, bright light).

Negative punishment or Punishment 2 is the decrease of the likelihood of a behaviour occurring if this prevents or stops an appetitive stimulus from occurring (e.g. if food, heat, an extra salary is removed).

Negative reinforcement and *punishment* are often confused. Here, the word *positive* means a stimulus is added whereas *negative* means it is removed.

Behaviour...		
	causes	prevents/stops
pleasant (appetitive) consequence	positive reinforcement	negative punishment (2)
unpleasant (aversive) consequence	positive punishment (1)	negative reinforcement

Fig. 17: Application of positive and negative reinforcement

Both types of reinforcements, positive and negative, have an effect on behaviour. For positive reinforcement, a pleasant stimulus is offered, e.g. praise and a smile from the teacher. Negative reinforcement means an unpleasant stimulus is given, e.g. the teacher is angry because the homework has not been done. Students will try to receive positive reinforcement more often and display the appropriate behaviour (put their hands up in class) and they will try to avoid the negative reinforcements (the teacher's getting angry) by doing their homework.

2.2.2 Cognitive learning

Apart from the behavioural approaches presented above, there are also cognitive concepts. These recognise and explain the thought processes behind learning. Learning is an active process. By thinking, people can acquire insights and knowledge. This can take place through active dealings with the environment (e.g. a child takes a toy, licks it or throws it away. By doing this it learns about the item's texture and also the consequences of his own dealings with it.)

Action is determined by thought processes and not only by external conditions (e.g. children can develop ways of behaviour that do not exist in their environment).

The connection between stimulus/environment and reaction/behaviour is cognitive representation: it is the coding and integration of information/stimuli/environmental factors in a personal experience and thought system that is not directly linked to perception (dogs are evil, maybe sheep are also evil → fear of animals). Stimuli are not only integrated but also evaluated and processed. Cognitive representations are also determined by 1. Contents (item, human behaviour); 2. Information channel (visual and audio input) and 3. type (pictorial, through negotiation, thoughtful, linguistic).

Cognitive learning can also be called learning through insight or thinking. It is described in greater detail by three characteristics:

- Insight is dependent on how the problem situation is configured
- There is suddenly success in learning, "the eureka effect"
- The acquired solution can be applied to other situations

In contrast to behavioural theory, conscious processes are emphasised here. Cognitive learning is described as the recording and processing of information because a person actively takes part in the process and the learning results, are not isolated connections between behaviour and consequences but structures.

Cognitive learning can be regarded from the point of view of verbal and non-verbal learning:

Verbal learning: This is about the acquisition of knowledge through language and about the organisation of cognitive structures. Two forms can be distinguished:

- knowledge pertaining to skills (e.g. writing, counting) and
- knowledge about facts (e.g. identification of statements, significance and contents of words and sentences).

Non-verbal learning: There also exists a visual and action-related representation of knowledge. This dual form of information acquisition, processing and storing was underlined by Allan Paivio. The dual-coding theory has different significances for learning:

- Information is either processed visually **or** aurally.
- Information is better learnt if it can be processed visually **and** aurally

If information is very concrete or tangible then a visual coding takes place. This can be helpful to solve abstract or concrete problems.

2.2.3 Planned action - Action regulation

While behavioural theory sees a strict causal link between stimulus, cognition and reaction, action-related theory relativizes this. It is based on the assumption that there is probably a connection between a person as he is understood to be and his actions. A person as a personality does not only react but also

deals consciously and creatively with working processes and the environment. Behavioural theories can be divided into two groups: theories of volition place an emphasis on a decision being made for a particular goal and pursuing it. Other theories look at how an action is carried out (action regulation theories). The development of a flexible action-related concept and later action-guidance will be looked at in closer detail below. An example for an action-related theory is the theory of Miller, Galanter & Pribram (Miller, Galanter & Pribram, 1960) that is presented here. Their concept is based on overall planning. It helps to describe and explain the structure of targeted activity. An analogy is made to a "programme" that controls a computer and plans are understood as hierarchically nested consequences of operations.

Miller et al. developed the TOTE model. Test, operate, test, exit corresponds to the schematic representation of an action that is understood in a cybernetic way. The actual value of a state of the organism, i.e. the present information, is compared with the desired value (test), an instrumental action is inferred (operate) whose probable outcome is then compared with the desired value (test) and when there is enough consensus it is carried out (exit).

The action of hitting a nail into a wall can be divided into three TOTE units:

- Picking up the hammer and
- Hitting with the hammer
- Check whether the nail is firmly seated

If the hammer is down, we lift it up. As soon as it is up, we hit the nail. We continue doing this, until the plan, checking the nail, finds, the nail is driven in completely.

Another example of action regulation according to the TOTE model:

Test:	The car-door is not shut correctly.
Operate:	Slam the door.
Test:	The door is shut.
Exit:	The action is complete.

The process can be described as a series of actions and monitoring. Action is organised in a hierarchical and sequential manner. When goals are more complex, then several components might be necessary to reach a common goal. Therefore, a tree-like nested hierarchical structure ensues (see Fig. Volpert, 1983).

Examples of goals: Prepare lunch, give a presentation, and complete studies.

At first actions are organised hierarchically. But because individual elements can as a rule only be carried out one after another, there is also a temporal procedure for a course of action (sequence).

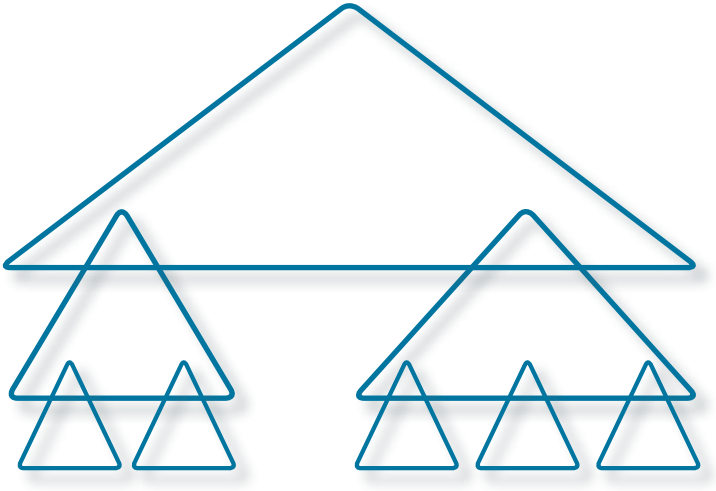


Fig. 18: Action-related organisation of actions

Each action serves a particular goal. Action is therefore goal-oriented. The action components were labelled plans by Miller, Galanter & Pribram (1960). These describe a hierarchy of instructions. A plan for an organism was seen to be "essentially the same as a programme for a computer, especially when it has a hierarchical structure."

A complex action such as writing a dissertation can be broken down into smaller steps, such as doing a literature search and reading, forming a hypothesis and testing it, writing and correcting etc. Each individual step can again be

broken down into smaller steps, down to elementary actions such as turning the page of a book. All these behavioural sequences serve a higher action and in the end the act of writing a dissertation. This action is also subjected to a higher act which is to be awarded a qualification that can be seen in the context of a comprehensive plan for life.

2.2.4 Learning and solving problems

In the area of higher learning processes, there are fundamental processes for a variety of problem-solving strategies. Problem-solving means going from an actual state despite resistance to a desired state through intelligent action, usually through conscious thought processes.

Problem-solving contains several steps:

1. **Definition of the problem**. Precise description of outset, perhaps also of outcome
2. **Establishment of a strategy**. Simple strategy: Trial and error, more complex strategies: Analogies.
3. **Implementation of the strategy**.
4. **Evaluation of the strategy**. It is tested whether the desired outcome has been achieved with the strategy.

Problem-solving takes place between two extremes:

1. Trial and error and other heuristic strategies (very simple problem-solving techniques).
2. Insight learning

The "Trial and error" hypothesis was tested by Edward Lee Thorndike, who experimented on rats. It does not assume there is any intelligence. For example: A dog that has been locked up will only make itself noticeable by barking. This might be followed by scratching at the door. If this does not help, he might jump at the door and perhaps accidentally manage to push the door handle down. If he is successful, he will have learnt from this trial and error method and use it again. Similar behaviour can be observed in children. If they learn that they can handle a situation by displaying certain behaviour, they will repeat it in future.

Insight learning or cognitive learning is the appropriation or reorganisation of knowledge based on the application of cognitive skills (perception, imagination etc). Insight means recognising and understanding a piece of information,

grasping the cause-effect links, the meaning and significance of a situation. This enables targeted behaviour that is usually recognisable when it changes. Insight learning is the dramatic, complete transfer to a problem-solving state (all or nothing principle) after initial trial and error behaviour. The behaviour that ensues from insight learning is almost flawless.

Six phases of insight learning

According to Wolfgang Köhler and Max Wertheimer's cognitive learning theory, there are six phases of insight learning.

- **Emergence of the problem**
  The discrepancy between the actual state and desired state (goal) triggers tension (motivation) and the search for a solution.
- **Trial and error behaviour**
  Trying out known and tested action strategies. Lack of success leads usually to a break in the action.
- **Reorganisation**
  The situation is rethought and restructured. Trial and error are not carried out here in reality but only in thought. The advantage by comparison to conditioning is that the risks if there is error are avoided.
- **Insight and solution**
  ... until the elements (often suddenly) come together as a whole (Eureka effect).
- **Application**
  The course of action begins and is maintained if there is success.
- **Transfer**
  The found solution is practised and can be transferred to similar situations.

People usually choose among various problem-solving strategies. One person will have stored various solutions in their memory. They observe the situation according to experience or other learned strategies and then choose a way of solving the problem adequately.

Further problem-solving strategies:

Algorithms: These are problem-solving strategies that are only suited to a particular type of exercise. An algorithm is a formula or set of rules that precisely defines a sequence of operations to solve a problem. It defines how input variables can be transformed into output variables step by step (e.g. to solve a set of mathematical equations.)

Means-end analysis: Is my solution the right means for reaching the end? Is the expected new state closer to the goal (desired state?)

Overcoming barriers: Restructuring a deadlocked strategy.

Working with analogies: Look for analogies of similar problems.

2.3 Representing information

The representation of information describes the way in which it is stored in the memory. Here are a few possibilities. Information can be stored in the form of

- linguistic units
- analogies, i.e. things are represented like they appear in reality (e.g. as a picture, a smell or sound)
- and action-related representations (i.e. as an action)

Information can be coded several times in the memory. For example, the word "chair" can be stored as a word or as a picture (like a photo).

2.3.1 Linguistic representation

The library model of a long-term storage has its limits; network models are more popular and better proven empirically.

Propositions are fundamental units of information / statements that are stored according to their significance and not according to their wording, which is proven by the fact that test persons always use different ways to express/verbalise such information.

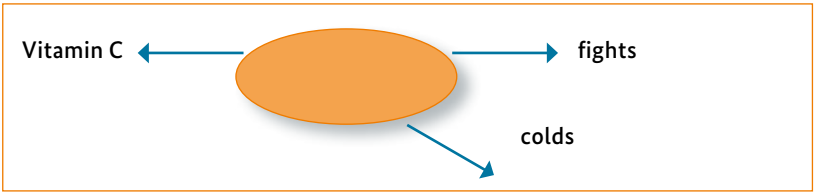


Fig. 19: Simple information network

Propositions can be connected to each other in the learning process, which creates an information network. New information has to be "docked" to the network (prior knowledge).

For example, a student might read a text on the subject of Vitamin C and colds and then the following process might take place:

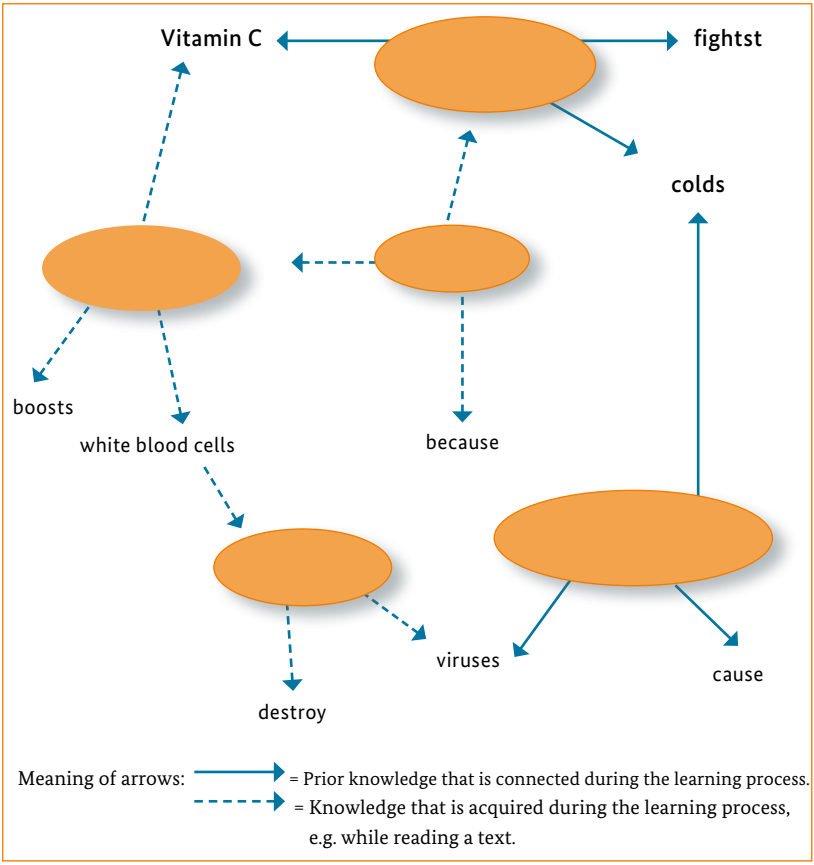


Fig. 20: Complex information network

By reading the statement "Vitamin C fights colds," the nodes "vitamin C" and "cold" are activated in long-term memory. The transmission of the stimuli takes place in the information network, which makes further components of the information network (e.g. "Vitamin C boosts white blood cells") available to the short-term memory. If new connections are recognised, then other links are posited (e.g. "white blood cells destroy viruses"). The better new knowledge is connected via elaboration to prior knowledge, the easier it can be remembered (i.e the better stimuli are transmitted in the information network). Concepts for an area of knowledge ensue from such connections of propositions.

Furthermore, defining attributes/characteristics are accorded to the elements of the network. For example, necessary attributes for the word "father" are "genetic origin" and "male sex". There are also attributed characteristics that are not so necessary but that can be helpful sometimes (e.g. "lives with mother", "has an educative function"). This is known as a "schema".

Schemata can themselves be divided into role schemata ("father") and event schemata, which contain procedural information about a course of action. Event schemata are also known as scripts. Our scripts when we visit a restaurant tell us that after choosing our places, ordering, eating and talking we also have to pay before leaving.

Schemata can be arranged hierarchically. Schemata for "bird" and "canary" are connected in a hierarchy. The canary has to fulfil other characteristics ("is yellow", "can sing"); but the typical characteristics for a bird ("has wings", "can fly", "has feathers") do not have to be introduced in a hierarchical arrangement into the "canary" schema, which encourages efficiency of storage.

2.3.2 Analogue representations

This is when representation is based on concrete reality. A visual perception triggers memory, i.e. an image that is similar to the original perception. For other channels of perception (auditive, gustative...) similar examples can be imagined.

The dual coding theory was developed by Paivio. Essentially, it says that depending on the type of information, a linguistic representation, an analogue representation or a combination or both kinds of representation are possible.

In many cases, contents represented in an analogue manner can be more easily remembered and are superior in terms of speed of information processing ("picture superiority effect"); dual coding tends to increase the chances of information being called up again. When information is represented in an analogue way, dual coding usually takes place.

2.3.3 Action-related representation

A clue to a further type of representation is the fact that the activity regulation of many motoric procedures takes place in an automated way, in the sense that often procedural, and not verbal, information is used, which cannot be represented simply in an analogue (visual) way (i.e. riding a bike).

On the other hand, when dealing with things and problems by drawing on semantic, procedural and conditional information and thus re-structuring these types of knowledge, a scope of processing develops that cannot be achieved otherwise. What is still unclear is what makes this representation of information so particular. Perhaps it is just a representation that addresses several senses and in which emotions participate in a more intensive way (experiences of success...).

2.4 Types of knowledge

Different types of knowledge are distinguished in psychology, some of which have been empirically proven to use different parts of the brain in the storing process.

- Declarative knowledge
- Procedural knowledge
- Conditional knowledge
- Conceptual knowledge
- Metacognitive knowledge

Declarative knowledge is knowledge of facts, concepts, terminology ("knowing something") as opposed to **procedural knowledge** which is "knowing how" (i.e. how to drive a car) and **conditional knowledge** (knowing when and under what conditions something is valid/effective). Declarative knowledge can be further divided into semantic knowledge which contains impersonal knowledge of facts, and episodic knowledge which is the memory of personal, autobiographical events.

In the field of education, the psychological differentiation between the terms declarative, procedural and conditional knowledge is placed opposite the question of the significance of knowledge of facts (declarative knowledge) and knowledge of methods (procedural and conditional knowledge). The different types of knowledge have to be connected to each other sensibly in the learning process so that action-related competence ensues. Take for example, the term "solvency":

First of all, I know what the indicator "solvency" means. I know the formula (declarative knowledge). I learn how it can be calculated (procedural knowledge) and I learn in what situations I can/should use it (conditional knowledge).

When trying to solve practical problems, information that is recognised as being relevant is introduced into the short-term memory. Then, the stimulus spreads to the long-term memory by searching for relevant, already-stored declarative, procedural or conditional information. The existing information network is then expanded by new elements of knowledge and becomes part of the network.

For the purposes of teaching and school, one can also differentiate between what is known as conceptual knowledge and metacognitive knowledge and declarative, procedural and conditional knowledge.

Conceptual knowledge has been networked many times. It is represented by classification, principles, categories, models or schemata. Classic examples are the transfer of a real situation to a mathematical model. Conceptual knowledge is the basis for significant and profound understanding of specialist knowledge (by comparison to learning facts by heart or using easy algorithms). Conceptual knowledge enables knowledge to be accumulated within a particular subject. Learners can create relations between units of information they already have access to and new information.

Metacognitive knowledge is knowledge about one's own cognitions (own learning goals, learning habits etc.) and the ability to guide one's own learning process (monitoring strategies) as well as applying information-processing

strategies and problem-solving strategies in a targeted way. For example, strategic knowledge for the reading process: Students have to know why they are reading a text or what they can do if they don't understand a passage. Metacognitive knowledge is encouraged by getting learners to check the results of an exercise themselves.

2.5 Theories of forgetting

One condition for forgetting is that information was once known and stored in the long-term memory. This is known as a memory trace (engram), which leaves behind a trace of information at the anatomical and physiological level (changes in RNA - protein synthesis, changes to nerve cells and their synapses).

a) **Trace decay theory** (confirmed via experiments for short-term memory)
A memory trace decays with time, when it is not rehearsed, repeated or used. This theory is only relevant for short-term memory.

b) **Interference theory** (confirmed for short and long-term memory)
Older material can distort or disrupt new information (proactive inhibition) and new material can distort or disrupt older information (retroactive inhibition), the more similar learnt content is. Similarities in sound (phonetic), in meaning, in appearance or in the kind of presentation or representation (verbal, analogue) all play a role here.

Interference theory can explain the saturation that can occur when studying similar material for a long time.

c) **Repression theory** (well proven by experiments for long-term memory)
Information that is associated with negative feelings is more quickly forgotten than that which is associated with neutral or positive feelings. This mechanism can serve to protect feelings of self-worth/self-esteem.

d) **Lack of adequate retrieval stimuli**
Information that has been stored in the long-term memory cannot be recalled because it is not adequately connected to other pieces of information in the memory, or these connections were not used enough.

Often memory can be triggered by external prompts (see chapter on instrumental learning)

2.6 From transmitting knowledge to transmitting competence

Knowledge is a stock of facts, theories and rules that is accessible to people or groups. Knowledge alone is not enough to overcome complicated and demanding situations at work and in social life - it has to be used correctly. The ability to use knowledge appropriately in particular situations is described as competence. This is the ability of the individual to act appropriately, in a reflective manner, in professional, social and private situations, as well as an individual and socially responsible. The situations can be everyday situations. They can also be problem situations or situations that the person does not know. In these situations it becomes clear whether a person is competent or not. If a person manages to handle a problem situation then it can be said that they are competent.

Often teachers in secondary technical school or trainers in companies observe that students and trainees do not apply the knowledge that they have learnt at school. This problem is caused by a phenomenon known as “inert knowledge”.

Digression: Inert Knowledge

Inert knowledge is a term from cognitive psychology and the psychology of learning. It is knowledge that exists in theory but is not used in practice. Inert knowledge has been understood in the abstract but cannot be transferred to new situations and not in a constructive manner (e.g. to solve a problem). There is a gap between knowledge and action. A known example is the lacking ability to call up vocabulary from a foreign language that was learnt for a class test in the concrete situation of communication.

2.6.1 Dimensions of action-related competence

Action-related competence is a complicated construct made up of different aspects. It can be defined as

“... the ability of the individual to behave appropriately, with reflection, in a way that is individually and socially responsible in professional, social and private situations.” (Conference of Cultural Ministers, 5 February 1999).

Action-related competence is demonstrated when people are in a position to handle everyday situations as well as problematic or unfamiliar situations in an appropriate way. For professional action-related competence, this means that people have professional action-related competence when they are able to handle everyday situations and problem situations appropriately in their professional life.

The construct of action-related competence can be divided into smaller categories:

- Specialist knowledge,
- Social competence,
- Human/personal competence,
- Method-related competence,
- Communicative competence
- Learning competence

Method-related competence, communicative competence and learning competence are immanent components of specialist competence, human competence and social competence.

Explanation of various areas of competence:

Specialist knowledge is the readiness and ability to solve tasks and problems clearly on the basis of subject-related knowledge, using certain methods and acting independently, as well as to evaluate the result.

Social competence is the readiness and ability to inhabit and shape social relations, to know how to deal with others in a rational and responsible manner and to make oneself understood. The development of social responsibility and solidarity with others is an important element.

Human/Personal competence is the readiness and ability to tackle development opportunities, demands, family constraints, career and public life as an individual, to think things through, to judge one's own ability and skills and to develop further plans for life. This also includes personal characteristics such as independence, the ability to criticise and be criticised, self-confidence, reliability, responsibility and an understanding of duty, as well as the development of thought-through moral concepts and the self-determined connection to values.

Method-related competence, learning competence and communicative competence emerge from a balanced development of these three dimensions. Competence is the learning success with regard to a single learner and his or her capability of acting independently and autonomously in private, professional and social situations. By contrast, qualification is understood as the learning success with regard to the usability, i.e. from the point of view of demand in private, professional and social situations.

Method-related competence:

Important elements are for example the ability to:

- read a text and spot the most important information, structure it and pass it on
- develop an opinion on a piece of information, to express and justify it and represent it in a controversial debate,
- recognise mathematical relations in material and to develop solutions to a problem on their basis,
- use different media in order to acquire information.

Learning competence:

This is the readiness and ability to understand information about facts and contexts on one's own as well as with others and to evaluate and order it in thoughtful structures. This enables successful learning.

With regard to professional life, learning competence develops in the intellectual processing of specialist representations, such as drawings, schematic diagrams, as well as in the understanding and interpretation of social relationships and activity in groups and their documentation. This includes newspaper and magazine articles and films. The ability and readiness to develop learning techniques and strategies at and away from work and to use these for further training are also important elements of learning competence.

Communicative competence:
This is the general use of language (spoken and written) to make oneself understood to other people and to communicate with others with language.

It includes the knowledge of important concepts and models of communication but also the mastering of concrete communication techniques. It is not only about skills and ability, however, but also about wanting to communicate - this plays a key role.

- An ability to communicate means being able to express oneself in such a way that is understood and heard while
- the readiness to communicate is about one's own desire to enter an exchange with others, to clarify matters verbally and to impart knowledge via communication.

2.6.2 Imparting competence

As opposed to acquiring knowledge, competence can only be acquired by students when they deal with certain tasks and situations (learning situations) independently. These situations have to be shaped in such a way that the precise areas of competence that need to be acquired are called upon to solve them. Students have to work on the learning situations alone or in groups. The knowledge that has been imparted is applied in the learning situation (see example in Fig. 4).

2.7 Psychology of learning and lesson planning

On a conceptual level, the findings of the psychology of learning underlie action-oriented learning or action-oriented classes. Just like traditional classes do, action-oriented lessons want to ensure the retaining, understanding and active application of knowledge, skills and abilities. In professional education, such classes require learning that is based on complicated and problematic exercises related to a profession. In organisational terms, it is key that students are able to study independently. A lesson takes place according to a system of actions. Students can bring in their own experiences and work with other students in groups. Thus, they communicate with other students about the material and use the knowledge in typical situations. This combination of aspects contributes to the students understanding the material better and retaining it for longer.

Several hints can be given for shaping class and independent learning procedures on the basis of findings from the psychology of learning:

1. Measures for increasing attention and concentration
- Variation of stimuli: e.g. changing pitch, volume and speed of verbal communication
- Unexpected behaviour
- Presentation of surprising contradictions
- Take into account saturation and tiredness by ensuring there are breaks at appropriate times, e.g. maintain breaks instead of finishing earlier, the activities in breaks should differ from those during learning (→ yard) etc.

2. Relieving the short-term memory
- Present the material in a hierarchical sequence from the simple to the complex
- Summarise pieces of information into bigger units (chunks, e.g. AIDA = Attention, Interest, Desire, Action)

3. Systematic repetition
Exercises, homework, phases of repetition at the beginning of the class, flash cards ...

4. Discuss the meaning / point of the material with learners
Relevance to practice, to exams, to life ...

5. Pre-structuring of material
By pre-structuring material, students have access to concepts that can be categorised more easily and later called up more easily
- e.g. hierarchical visualisation of material on the board, overviews, advance organiser, key points, structure

6. Give classification schemes
e.g. make an analogy between blood circulation and the water supply system of a city (closed system, sewage plants etc.) in biology class

7. **Elaboration: Connecting processing of material, increase processing depth**
   - Make connections to known material and own life experience
   - Create links within and between different levels of representation e.g.:
     - linguistic connections (rhyming techniques, mnemonics)
     - connections between linguistic and visual material
     - connections between verbal material and actions, e.g. to relate a purchasing contract to everyday shopping
     - structuring of material by students (Metaplan, mind-maps...)
     - integration of pieces of information into an existing structure by students themselves
     - Interpretation and evaluation of facts, discussion

8. **Using sensory variety** e.g.
   - Have vocabulary read out loud
   - Teachers or students visualise processes and structures
   - Let knowledge be experienced through action (role-plays, simulation, projects)
   - Have analogue material (caricatures, diagrams) verbalised and evaluated

9. **Take into account interference between similar material / methods**
   - Alternate material, methods and coding (linguistic, verbal and action-related) during and between classes

10. **Organise learning process in a way that is motivating**
    - Explain short and long-term goals and advantages of learning process
    - Set partial goals
    - Give rewards for achieving partial goals
    - Say in advance what the reward will be
    - Plan times for learning and for taking breaks

11. **Fear-free, pleasant working atmosphere and (positive) emotions in the learning process**
    - Constructive communication
    - Extra-curricular measures to promote a good class atmosphere
    - Transmit enjoyment of learning success, e.g. individual feedback about successful learning
    - Allow fun and funny contributions or bring them in yourself as a teacher
    - Evaluate contents, ask ethical questions, allow emotional discussions (within limits)

3. From traditional to action-related teaching

In the secondary technical school the way something is taught is always influenced by the business sector and companies. New technologies, working processes and specialist knowledge that are necessary for modern professionals mean that the way teaching takes place is changing. Demands at work are often very complex. Changes and technological developments are part of daily life, particularly in the area of IT and communications, but also in other areas of commerce.

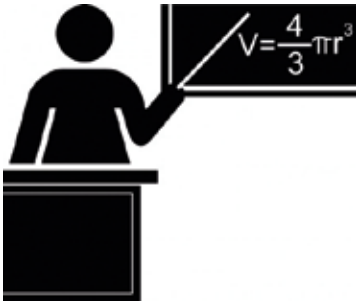


Fig. 21a: Traditional teaching

Therefore it is not enough anymore to simply impart sheer information to students. They have to learn how to deal with new material and new processes independently. Traditional classes have their limits in this regard. In order for students to develop method-related, social and human competence, there has to be a different kind of class in addition to traditional teaching concepts that are teacher-centred and that is where action-related classes come in. There are also forms of teaching that are a mixture, integrating more or less student activity into traditional teaching.

3.1 Traditional teaching

Many surveys across the world show that even in the 21st century, teaching often takes place in a very traditional manner. This means generally that teachers present the material that has to be learnt and that they know in a clearly structured way to the class he follows the system of the respective subjects. The students are guided externally and only sometimes are they called upon to answer a question or to work on an exercise. Such teaching has certain advantages but the disadvantages have long been known to researchers. The advantages include:

- Students can absorb information in a structured way.
- The teaching plan can be worked through chronologically.
- Traditional teaching is suited to big classes.
- etc.

The disadvantages include:

- It is hard for students to listen for a long time.
- Students remain in a passive role and often do not connect the new material to their prior knowledge.
- Students are often not very motivated to really come to terms with the material. They ask themselves why they should learn it. Often they do not recognise the connection with their lives, with the job.
- Students can recite knowledge from memory or write it down but they do not know how to apply it in a concrete situation at work or in life.
- etc.

So that the disadvantages can be overcome, it is recommended that students be actively involved in the class. Learning is an active process. Every person reconstructs new knowledge even if he or she is only listening. However, research has shown that we retain
- 20% of what we hear
- 30% of what we see
- 80% of what we can formulate ourselves and
- 90% of what we do ourselves.

This means there are good reasons for turning traditional teaching into even better teaching by involving students more!

Traditional teaching with elements involving students as a further development

Teachers can begin enriching traditional classes with small steps by introducing (small) student activities. After a phase in which the teacher introduces new knowledge for about 10 minutes, students get the chance to do an exercise using the new knowledge to solve it. This way, they can see for themselves if they have understood the new material. They can work alone, in pairs or in groups. Then the whole class can work as a group again. This way classes have a certain rhythm (“giving rhythm to class”): A teacher-centred phase is alternated with a student-active phase etc...

3.2 Action-oriented teaching

Action-oriented teaching involves classes that enable "holistic learning" in the sense of "with the head, the heart and the hands" (Kerschensteiner) which at the same time connects with the interests of the students. In professional schooling activity-oriented teaching is specifically aimed at acquiring general action-related competence.

Fig. 21b: Action-oriented teaching

Students should no longer simply learn information by heart in school and in classes but should be able to apply this knowledge in concrete situations. This means that students should be confronted with complicated, professional (work) tasks. They should be able to solve them independently, from the setting of goals, to planning to implementing, to monitoring and evaluating the result. The solving of concrete situations often is done in a cooperative manner, e.g. with other students in the group. This means that different aspects of competence, subject, methods, social and personal competence should be applied. If possible, in a classroom a future real-life work situation should be simulated with the new material ("situated learning").

After action-oriented teaching was introduced, new lesson plans were designed. These are based on the way activities occur in a profession. Learning areas were developed in Germany in 1996.

With regards to designing lessons, the aim of action-related competence is supposed to be implemented by action-oriented teaching. The characteristics of action-oriented teaching are completeness, i.e. by processing complicated, authentic professional situations; all aspects of competence are addressed.

Completeness:

- Specialist knowledge
- Method-related competence
- Social competence
- Human/personal competence

Students solve problems in class (alone, in pairs, or in groups) that are as authentic and realistic as possible and go through all the phases of a complete action:

- Setting a goal
- Planning
- Execution
- Monitoring and evaluating

The fundamental motivation (motive = basis for motivation) lies in the phase of setting goals. The solving of authentic tasks does not necessarily have to have an artificial motivation at the beginning of the lesson.

The fact that students deal with authentic tasks already provides motivation since the aim is clear and does not need a special explanation, for example by the teacher.

When the students have worked on the task (setting a goal, planning, execution) they should check themselves to see if they have reached the desired result (monitoring and evaluation). The students then present their answers in class and can thus compare and discuss whether they are right or wrong. If they are wrong, it is important for students to know why as this will help students to learn even more, as long as they understand what mistakes were made.

Fig. 22 Moderation material

3.3 From the learning area to the learning situation

One peculiarity of teaching in secondary technical schools are learning areas. Curricula based on these are oriented towards professional situations. What is important apart from the material students have to learn are the skills that students have to acquire? The situations that crop up in professional life form the starting point for reflections on selecting and systematising the competences that need to be acquired and the material that has to be learnt. The professional situations (e.g. to set up a construction site, found a company, repair a car) are presented in the way that they are likely to occur in reality.

Professional situations are summarised in what is known as learning areas. These are fields that have been prepared in a scholarly way. They summarise complicated tasks that can be carried out in activity-related learning situations.

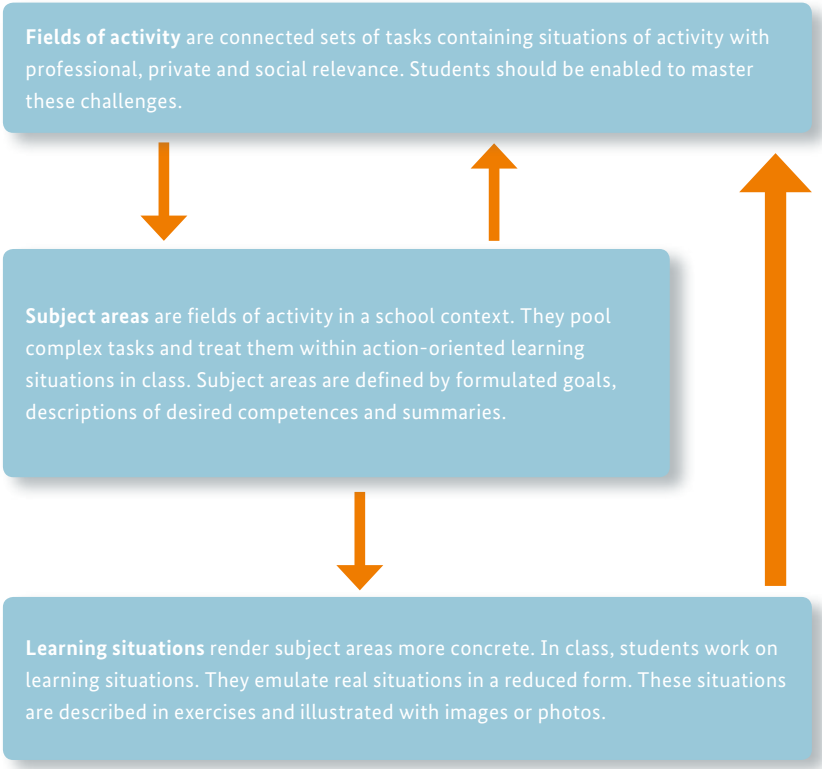


Fig. 23: The connection between professional fields of activity, subject areas and learning situations

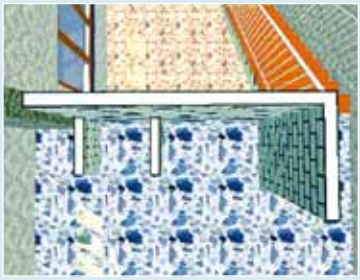
Learning situations are tasks that the students carry out in class which imitate an authentic situation (see example in the diagram below). The situations have to be described in detail so that the students can imagine them. Then the students reflect alone or in groups how they would solve the situation appropriately. It is also possible to impart knowledge that will help solve such a situation. Texts with information about it can be given out or may be found in the school book. The following diagram shows two learning situations.

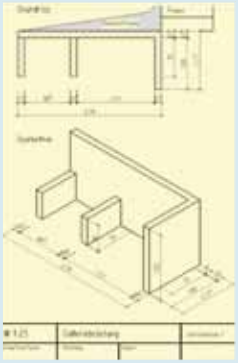
The students are called upon to apply their knowledge in a professional situation. If the learnt material is used then it cannot become inert knowledge. The students also learn in what context learnt material will later be useful in their jobs. This is a good method that also leads to motivation. The students know that knowledge at work is useful. So that the students can also transfer their knowledge to other similar situations at work, the learning situation should always be altered. Students have to recognise what knowledge they need from class in order to solve new situations. If they can find the right material and apply it to a problem, then they have acquired action-related competence.

Learning situation 1

Producing a wall cornice (11,5cm) inside a building

Individual work





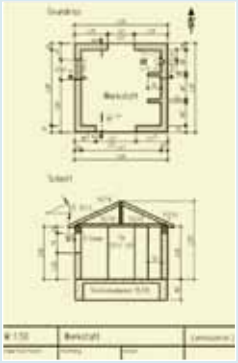
Task:
In a flat, a cornice has to be bricked in on the edge of a floor opening to create a seating area

Plan the work and carry it out!

Learning situation 2

Building 24cm-thick exterior walls for a small workshop

Group work



Task:
Mr Neuhaus wants to build a workshop behind his garage for his hobbies. Your company has been tasked with carrying out the bricklaying.

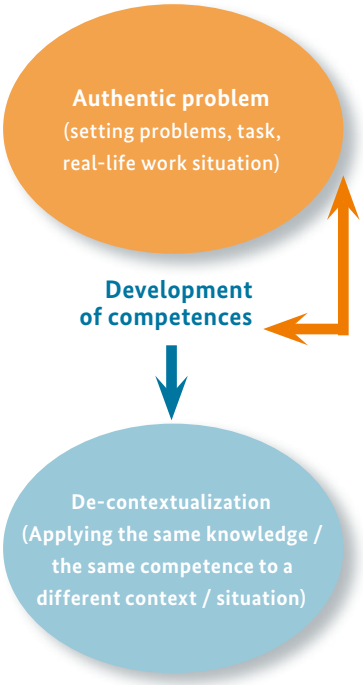
Plan the work and carry it out!

Fig. 24: Learning situation related to construction

So that the students can also transfer their knowledge to other similar situations at work, the learning situation should always be altered. Students have to recognise what knowledge they need from class in order to solve new situations. If they can find the right material and apply it to a problem, then they have acquired action-related competence.

The diagram below shows how teachers can impart competence in class.

Imparting action-related competence: Procedure



Introduction of a subject/topic with the help of an authentic problem.
Students try to solve the problems alone or with other students. The teacher gives them the necessary information (verbally, texts etc.) and the students solve the problem with their newly-learnt knowledge.
→ Development of action-related competence with the aim of guiding students towards life-long, self-guided learning.

Fig. 25: Developing competence

3.4 Features of action-related teaching

Action-oriented teaching aims to impart action-related competence. So that this goal can be reached, certain conditions should be met in class. They are based on the explanations given above:

- **Setting authentic tasks**
- The tasks and procedures are guided by the principle of **complete actions** (including these phases: Setting goals, planning, execution, monitoring and evaluation)
- **Self-initiative and self-monitoring** by students
- Students solve their tasks independently, either by themselves or as part of a group (= **cooperative learning**)

The following diagram illustrates the features of action-oriented instruction

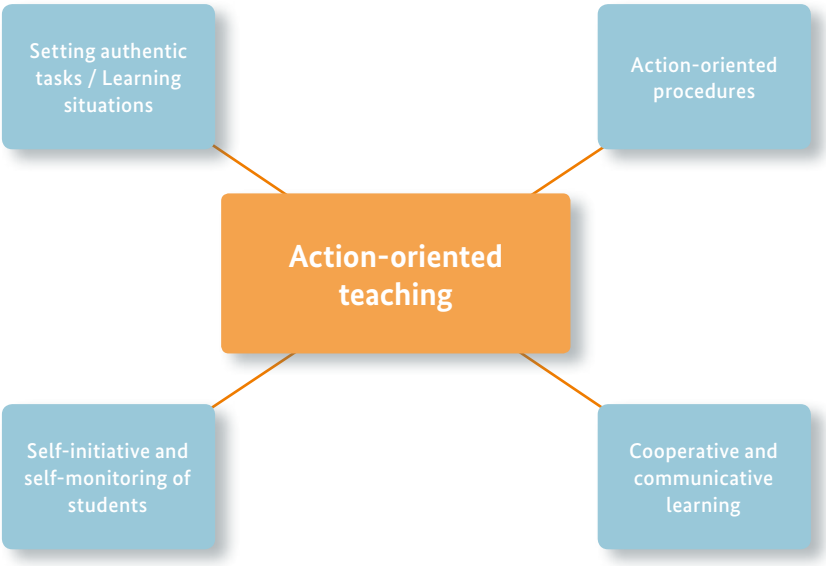


Fig. 26: Features of action-oriented instruction

Further features and requirements for action-oriented teaching:

Apart from the points mentioned above, there are some other criteria for action-oriented teaching. These are to be understood as maximum criteria. Not all of the criteria can be met at the same time in class:

- Material and tasks must have **theoretical substance**. Tasks that are mainly related to professional practice but do not have any theoretical considerations do not fulfil the requirements.
- Exercises should be **complex and contain problems** so that students have to make the effort of planning and taking decisions.
- The subject and material covered have to take into account the **different demands required by the profession** (e.g. theory, practice, arithmetic, drawing, business studies, IT, ...)
- Learning takes place in **complete actions** (setting goals, planning, execution, monitoring, evaluating)
- Students are largely **independent** and work according to their own initiative and speed, on the basis of work and information provided.
- The working environment enables theory to be learnt that can be **associated with practical activity.** Thus the skills that are typical for the profession are learnt.
- Apart from subject-related material, **qualifications that go beyond the subject**, such as method-related, social and human competence needed for the profession are also promoted.

4. Similarities and differences between didactics, subject didactics and the didactics of theoretical vocational instruction

Teaching in secondary technical schools distinguishes between different ways of lesson planning. Depending on the subject taught at the school, a certain way of teaching is best suited to ensure optimal learning. For some subjects, a general-purpose procedure for teaching is appropriate, for others, special steps and procedures will ensure that students learn well.

The first part of this chapter will help to distinguish between various schools of thought concerning didactics in vocational instruction.

4.1 What is the meaning of the term "didactics"?

The science of didactics deals with teaching and learning. All scientific knowledge on teaching and learning is collected and analysed in order to make sure that students are able to learn as well as possible. Didactic models were developed to help teachers plan their lessons. These models are clearly structured and aim to present the essential aspects of lesson planning. They are called "didactic models". There are general didactic models and special models for teaching at secondary technical schools.

The Berlin Model (see fig. 27) is one example of a general didactic model.

The model shows which aspects teachers should consider when they plan their lessons. The first two aspects concern the condition under which the lesson will take place:

1. The basic conditions under which the lesson will take place (**socio-cultural conditions**).
2. The characteristics of students and teachers, of the people who take part in the lesson (**anthropological-psychological conditions**).

Next, there are four aspects of lesson planning that require **decisions** to be made by the teacher:

- **The lesson's intentions and goals**
- **Content**
- **Methods**
- **Media resources**

Decisions in one area will influence the decisions in another area. For instance, not each content is suitable for every goal and not every method is appropriate for every content.

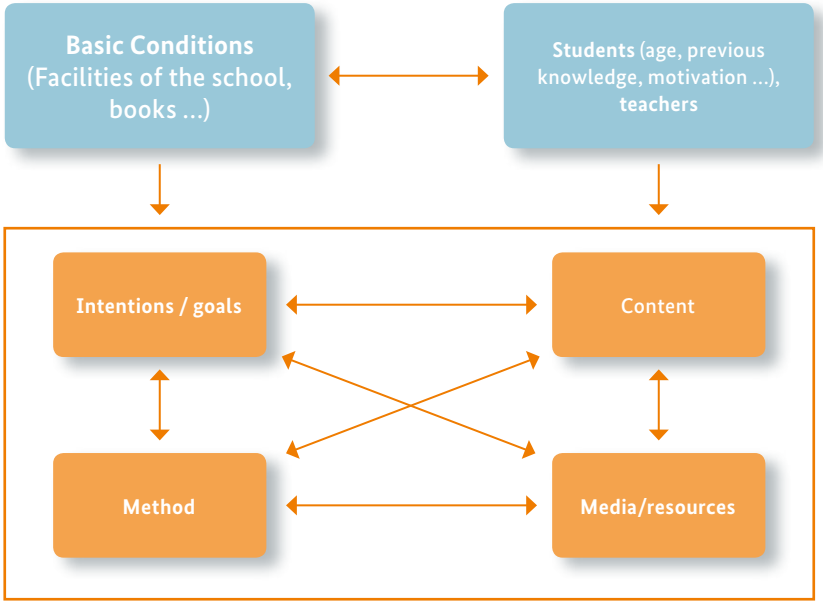


Fig. 27: Berlin Modell

The model can help the teacher decide how to plan his lessons. The figure below shows one way of lesson planning provided by the model:

The Berlin Model: Steps of lesson planning		
1	Goals	→ Curriculum
		→ Learning goals for the lesson
2	Preconditions of the students	→ Composition of the class: - Number of students - Previous schooling - Professions/Training courses - Students' motivation/participation
3	General conditions	→ Facilities and equipment
4	Content	→ Which content? → Amount of material to be taught?
		→ Significance of the lesson's content for professional practice
		→ Necessary (previous) knowledge of students → Order of the content taught (from the simple to the complex or vice versa, systematic, analytical etc.) → Visualisation (Transparencies/models)
5	Course of the lesson	→ Warm-up / motivational phase / Setting the problem
		→ Formulate learning goals
		→ Choose teaching methods and student grouping (instruction followed by individual or group work))
		→ Choose resources (Blackboard, worksheet, model, film etc.)

Fig. 28: Steps of lesson planning according to the Berlin Modell

The Berlin model is a general didactic model.

4.2 Subject didactics and didactics of theoretical vocational teaching

There are individual didactic systems and models for individual subjects, which answer to the specifics of teaching and learning in these subjects. Subject didactics are usually organised according to school subjects (e.g. didactics of physics, didactics of history). But there are also didactic systems which combine several subjects. They are called "field didactics", such as didactics of technical subjects,

didactics of science, and didactics of foreign languages. Others only deal with certain aspects of a subject (didactics of literature, didactics of language). "Field didactics" are more commonly used internationally.

All subject didactics in vocational training prepare students for tasks within their country's economic system, for instance in administration, the service sector (banks, restaurants, repair workshops etc.). It is the overriding goal of teaching in secondary technical schools to enable students to practice a profession. Theoretical teaching communicates the necessary theoretical knowledge; in practical lessons, students can carry out actual activities (e.g. build a wall, cook a dish, repair a part of a car). Thus, vocational teaching communicates both

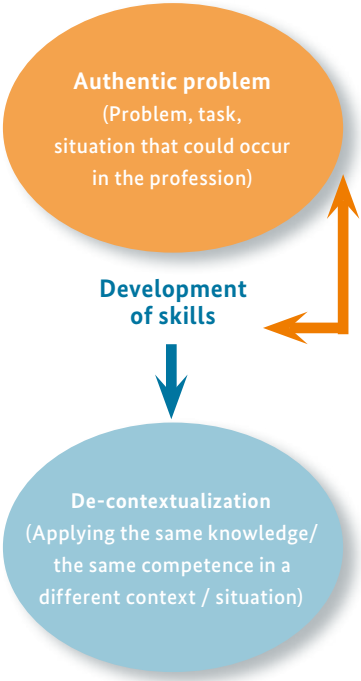
- Knowledge (of facts and theories) and
- Activity-related competence (the application of theoretical knowledge in a concrete activity)

This means that students should not just acquire knowledge by rote in their lessons, but should also be able to apply what they have learned.

To prepare students for their professions, the didactics of vocational education consider the following basic teaching principles:

- To confront pupils with authentic problems and situations which they will encounter in their professions
- To build on the students' interests, previous knowledge and every-day experiences
- To enable students to make authentic experiences, rather than chiefly teaching verbally
- To confront students with realistic tasks which will motivate them to later plan their professional activities independently and to allow for periods of planning, implementation and result control
- To highlight the significance of the contents that are taught
- To provide opportunities for independent activities of students in individual, partner and group work during lessons.

Procedure of teaching action-related competence



Introduction to a teaching topic using an authentic problem.
Students try to solve the problem, alone or together with others. The teacher provides them with the necessary knowledge (verbally, using texts etc.) and the students solve the problem with their newly acquired knowledge.
→ Active competences are developed that will guide students towards life-long, self-regulated learning.

Fig. 29: Teaching action-related competence

An example:

Students are being trained as industrial business management assistants. In industrial businesses, new business equipment, such as new computers or office furniture, often has to be bought. In the professional world, various manufacturers are invited to submit offers. This situation is now transferred into a lesson.

The situation is explained to the students during the lesson (verbally or in written form) and offers for different computers are presented. Then, the students are asked to decide alone, in pairs or in groups of 4 to 5, which offer is the most reasonable (regarding the price) if ten computers are to be purchased for the company. Teachers could bring real offers (e.g. from newspapers, shops in the city or the internet) to class. The students will study the various offers and then decide on the most reasonable one. Following this, they will present their solutions in front of the class. Guided by the teacher, the class will then note down important criteria for the decision about the most reasonable offer.

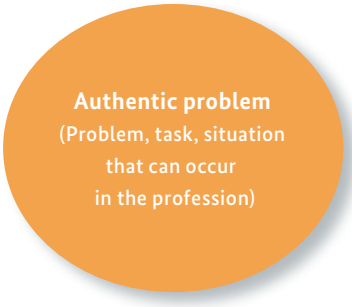
Students have now gained the competence to compare offers and choose the most reasonable ones by themselves. This is a skill that students will later be able to use in many situations in their private and professional lives. Detaching a competence from the original context of school and classroom is called de-contextualisation. It means that the skill can be used and applied in other contexts and other situations.

Secondary technical schools often distinguish between theoretical and practical teaching. The previous explanations refer mainly to theoretical teaching, but can equally be applied to practical lessons. Taking two different subject didactics as examples, various procedures of planning and carrying out lessons in these subjects will be demonstrated in the following.

4.2.1 Didactics of teaching business studies

The didactics of business studies closely follow the method explained above:

- **Goals/learning targets:** The learning targets for the lesson and the topic are taken from the syllabus.
- **The topic:** The topic is embedded in an authentic situation that could occur in the working practice:



A simple **example** for an authentic problem:

"You work for a business that deals with technical equipment, such as mobile phones and computers. The business is expanding strongly and has to hire additional staff. How could you proceed? Describe various options."

Fig. 30: Authentic problem

- **Work on the exercise:** Students work on the problem (in pairs or in a group of four students).
- **Solution:** Students **present** their **solution**. The class compares and discusses their solutions. Solutions can be different and still correct.
- **Securing results:** Results are secured in the lesson (e.g. by writing them on the blackboard and having students copy them into their notebooks).

The lesson follows the structure of a complete action. This means that students will pass through all phases of a (learning) activity:

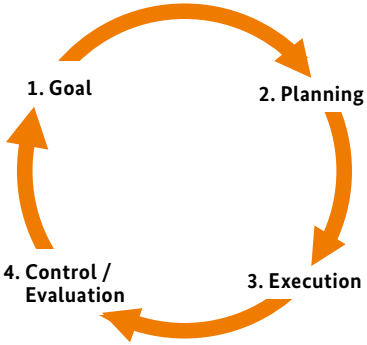


Figure 31: Cycle of activities – complete action

A teaching example describes the various phases.

An **example** of an authentic problem:

"You work for a business that deals with technical equipment, mainly with mobile phones. The business has recently been expanding strongly and has to hire additional staff. How could you proceed? Describe various options. Choose one option and describe it in detail."

Fig. 32: Work exercise

Phases of a complete action:

1. **Goal:** Students recognise the goal of the activity.
   Goal = Recruiting and hiring new employees.
2. **Planning:** How can we proceed as a business?
   We think about various options, such as placing a job advertisement in a daily newspaper or in the internet, or producing a notice or poster.
3. **Execution:** Students design a job advertisement for the internet or a job advertisement in a daily newspaper (see next page).
4. **Control/Evaluation:** Students check whether they have reached their goal of producing a job advertisement with all the necessary information. They present their results to the class.

We are a leading commercial enterprise for mobile phones. We are looking for staff in our purchasing and sales departments.

You should meet the following requirements:
- Punctuality
- Reliability
- Customer friendliness
- Ability to work in a team
- Intellectual curiosity
- Ability to think for yourself

We offer:
- competitive payment
- free and extensive training
- good working hours

Please apply to the following address:

Fig. 33: The exercise

4.2.2 Didactics of technical teaching

Central starting points regarding technical teaching are problems or mistakes and difficulties within an exercise. Solving and correcting mistakes or overcoming difficulties is the central activity. When you start to understand and structure problems or difficulties, you begin to search and research, to observe and reflect. Assuming an existing overall function of a technical system, solving problems will mean that students pass through various levels of the technical process. The figure below shows various levels:

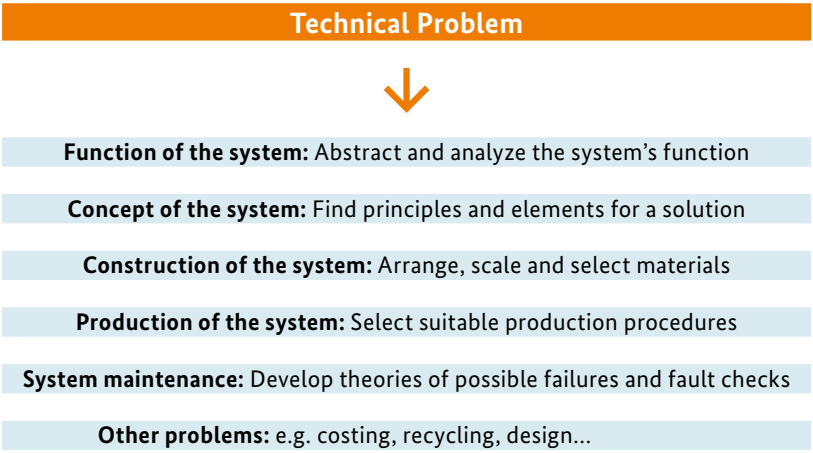


Fig. 34: Didactic structure of process of technical development

4.2.2.1 Procedures in action-oriented technical teaching

Action-oriented instruction does not only aim at passing on knowledge and skills. It is based on integral problems and enables students to solve these problems. In technical instruction, mainly the following three procedures with different levels of comprehensiveness are applied:

- **Experiment-based teaching:**
  Instruction based on experiments focuses on a manageable and limited technical problem. Students should:
  - Work out a question that is contained in the topic and formulate how it might possibly be explained (Preparation of the experiment)
  - Develop and construct a piece of equipment to verify or discard their assumptions (implementation of the experiment)
  - Formulate and discuss their qualitative and quantitative results (evaluation of the experiment).

- **Problem-oriented teaching:**
  Problem-oriented instruction is based on tasks regarding techniques. It is important that
  - Students are confronted with an intellectual exercise (setting the problem)
  - Students recognise the problem contained in the topic and that they structure and formulate principles for solving the problem (structuring the problem)
  - Students solve the problem as independently as possible, by themselves or in a group, and evaluate the solution (solving the problem).
  - Students are then able to transfer their strategy for solving the problem to similar problems (application of the solution).

- **Project-oriented teaching:**
  Project-oriented instruction focusses on tasks regarding design. The essence of this concept is that the tasks regarding design are integral and include several subjects. They follow the structure of a complete action:
  Gather information, plan, decide, execute, control and evaluate.

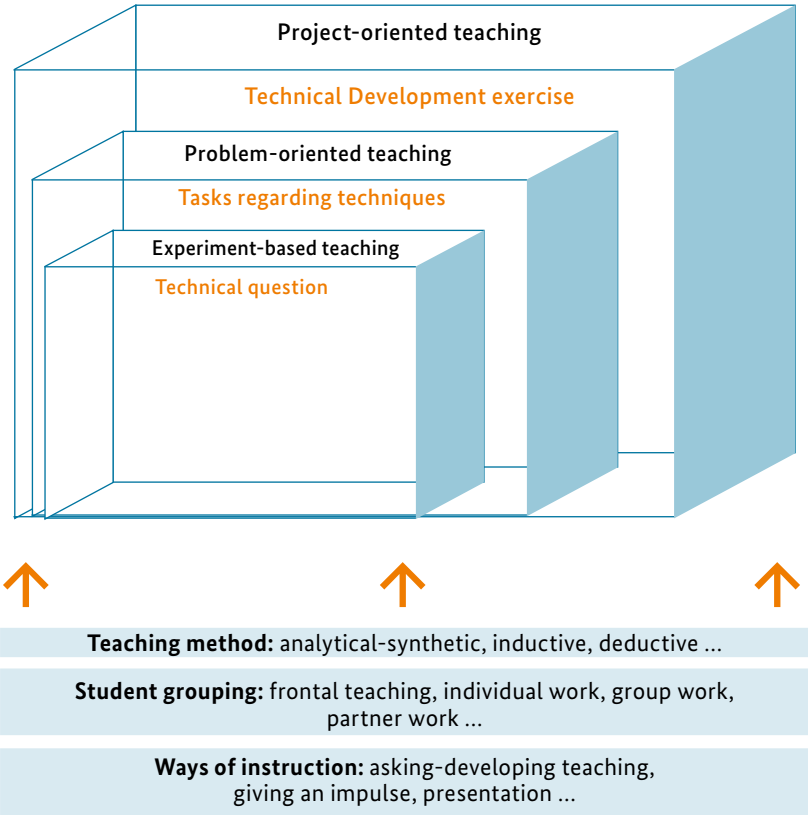


Fig. 35: Procedure in action-oriented technical instruction

The following will elaborate the concept of problem-oriented technical instruction in more detail.

For a student or apprentice, a technical problem occurs for instance when he is not immediately able to find a solution to a malfunction. In the work-place, two kinds of technical problems can occur:

- Problems for which there are immediate procedures that can lead to a solution or to a promising approach if applied sensibly. Problems of this kind require **"analytical thinking"** for their solution.

- There are problems that are not immediately recognised as "problematic" and which don't provide an instant technical solution process. Their solutions require **"genetic thinking"**.

Both kinds of problems have to be addressed and students have to receive assistance in solving them. The former kind requires "problem-oriented" instruction, where the learning phases are designed to illustrate a problem-solving procedure to the students. In the latter kind, creativity techniques will provide students with inspiration to solve the problem or help them to overcome details of the problem during the various phases of the problem solving process. In problem-oriented instruction, the learning process is initiated through recognising and solving problems that originate from a task regarding techniques. A student faces a problem when he cannot resort to previous knowledge, procedures and operations.

The concept of problem-oriented instruction

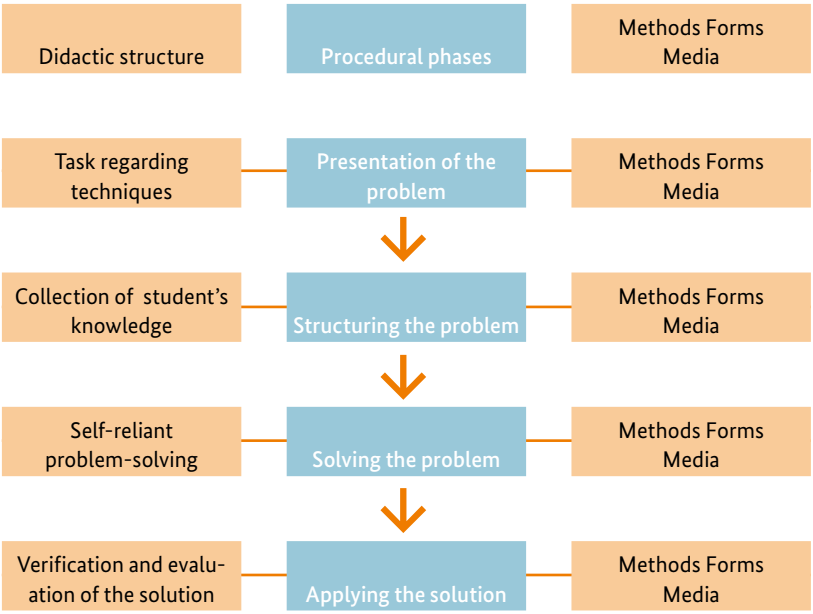


Fig. 36:

Concept of problem-oriented instruction

Phases of problem-oriented technical instruction

1. Problem definition

In problem-oriented teaching, problems that occur in professional practice can be used (in a didactically reduced form) as a motivating initial situation presented by the teacher in the form of a task regarding techniques. Not all technical problems are equally suited for use in class. Didactically useful technical problems should meet the following requirements:

- The problem should come from the students' working or private surroundings and be exemplary.
- Students should be able to come to an acceptable and presentable solution within a reasonable period of time.
- The problem should be of a nature that acquired action competences can be included in existing knowledge structure by the students.
- The competences transferred through the solution of this problem should be learning goals in keeping with the curriculum of instruction and training.

2. Structuring the problem

Finding the solution should not be arbitrary, so teachers should begin with a preliminary assessment of the problem's structure, its specific difficulty and the gaps in information. In order to make the most of the creative aspects of this step, teachers should not present the problem in a compartmentalised form of "Questions and Answers"-teaching. Teachers should rather encourage students to analyse the problem contained in the task for themselves, so that they can become aware of the cognitive function of the problem situation (problem analysis). Impulses by the teacher could provoke answers to the questions "why", "how", "in what" and "under which conditions", which could in turn initiate the planning of the solving to the problem. Therefore, problem solving can be further divided into two phases:

- Analysing the problem
- Planning the solution

3. Solving the problem

During the phase of structuring the problem, students should become aware that ideas for solutions should not be merely coincidental and that a proposed solution should correspond to the set problem, that it should be reasoned and not go against the requirements formulated above. Problem solutions are created by technical thought and action in all their forms. Since each problem has

a specific didactic value and since each path to solution also depends on the basic skills of the students, there is no general structure of the course of each path to solution. Based on the different learning procedures in problem-oriented technical instruction, problem solving could require different elements:

- **In an experiment exercise**
  Carrying out the experiment, documenting the results and transferring the results to the problem definition.
- **In a production exercise**
  Following a self-developed working plan for production, evaluating the result and the working process.
- **Technical analysis**
  Carrying out the analysis and documenting the results.

Depending on the complexity of the problem and its structure, the solution to a problem may sometimes be rather comprehensive. It can be taught in various student groupings:

- individual work
- individual work in groups
- partner work
- group work (e.g. learning circle, learning stations)

4. Applying the solution to the problem

Application is the final phase of problem- and action-oriented teaching. It aims to embed learning results in students' memories and to produce automation. This phase of instruction, depending on the subject and the problem, will result in

- Autonomous application of the way of solving and the solution of the problem in changed conditions.
- Transfer of the ways of solving the problem developed by the students and the solutions themselves with the aim of recognising identical problem situations.

Conclusion

The first objective of problem-oriented instruction is the communication of elementary knowledge and generalised insights about subject content (subject competence). It further requires students to apply fundamental thought processes and subject-specific procedures in order to come to an autonomous solution to the problem (method competence). Finally, by referring to the students' general situations, it encourages them to discover and evaluate their surroundings, to develop individual behaviour and to reflect on consequences (individual and social competence).

5. The duties of the teacher

Modern teachers have to do more than just teach classes. Their tasks can be divided into 5 areas:

1. **Teachers are experts on teaching and learning.** Their core task is the targeted and scientifically designed planning, organisation and reflection of processes of teaching and learning, as well as individual assessment and systemic evaluation. The professional quality of teachers is determined by the quality of their lessons, i.e. by the fact whether students are able to learn successfully in their classes.
2. **Teachers are aware that their task of educating students** in school is closely connected to lessons and life in school. The more closely they cooperate with parents and employers, the more successfully they will create this connection. Both sides should communicate and be willing to join forces to find constructive solutions for educational problems or failed learning processes.
3. **Teachers carry out their responsibility for assessment and guidance** in their classes and in handing out certificates for training and professional careers. They do this in a competent, fair and responsible way. This requires pedagogical, psychological and diagnostic competences.
4. **Teachers continue to develop their competences** and make use of opportunities of advanced and further training in order to be able to be up-to-date with the latest developments and scientific findings. Teachers should furthermore maintain contact with institutions outside school and with the professional world.
5. **Teachers contribute to the continual development of their school and their subject** as well as to the creation of a school culture which promotes learning and a motivating school climate. This includes a willingness to participate in internal and external evaluations.

5.1 The professional teacher

For a long time, scientific research of teaching looked for specific personality traits that marked a good teacher. Nowadays, research focuses more on certain competences and orientations. Good teachers are successful teachers. This means that good teachers give instruction that leads to good learning results. The professional teacher possesses specific knowledge and competences.

5.1.1 Knowledge and expertise

World-wide studies have identified the following aspects as significant elements of knowledge a professional teacher should have:

- **Expert knowledge** of his subject: The teacher should have a degree in the subject and should himself be proficient in mathematics, for example.
- **Interdisciplinary pedagogical knowledge:** There are certain basic pedagogical principles which are valid no matter which subject is taught, e.g. the way a teacher should guide a class.
- **Knowledge specific to a subject and its didactics:** Different subjects, like for instance mathematics, have specific contents (e.g. exponential functions). Certain procedures are very well-suited for teaching the contents specific to this subject. Teachers should acquire this knowledge during their training.
- **Knowledge about syllabi:** Teachers should know the structure of a syllabus and which competences and learning goals he should communicate to the students.
- **The subject's philosophy:** Some subjects have a certain philosophy. In subjects like history or mathematics, a professional teacher should be able to teach students to think like a real historian or a real mathematician.

Apart from knowledge, teachers should have certain **convictions and attitudes**. There is no single specific mixture of personality traits that makes up a good teacher. Everyone is different – some people may be extroverted, others may be more introverted, but both can be good teachers. It is important for teachers to be "real" or authentic, which means that they should not try to be a totally different person when teaching a class. At the same time, they should always consider certain professional ways of behaviour. For instance, they should respect their students at all times and never make fun of students or display other similar behaviour.

5.1.2 Teachers as role models

Furthermore, teachers are always role models for their students. Students will adopt their behaviour, their general attitudes as well as attitudes towards learning and many other things. Teachers should thus set an example of socially accepted behaviour, such as helping students to learn the standard language by always speaking it in class. This kind of learning is so-called learning through observation or learning from a model.

5.1.3 Dedication

Other important features are the dedication and enthusiasm that a teacher brings to his subject. A teacher who is dedicated and shows enthusiasm for his own subject can transfer this to his students. The important point here is not that the teacher should make a big show of his enthusiasm, but rather that he should really feel it. Students should not feel that his dedication and enthusiasm are insincere or inappropriate.

5.2 Necessary professionalism

Apart from the basic characteristics outlined above, research has identified further characteristics of professional teachers. The most significant feature is the readiness and ability to develop one's own professional skills. This means that professional teachers should not always rely on the same way of teaching, but should try to continually become better and to improve their teaching.

There are certain ways of achieving this:

- Analyse one's own teaching. What works well, what works less well? What can I improve about my teaching?
- Cooperate with other teachers: A professional teacher talks to his colleagues about what works and what does not. He asks them how they do it. Teachers may watch each other's lesson in order to learn from one another.
- Feedback: Teachers alone can't recognise all aspects of what is positive about their teaching and where there might be potential for improvement. They can ask for feedback, either from their students or from colleagues who have watched their classes. Students or colleagues may be able to point out things that the teachers themselves had not noticed.
- Cooperate with training companies, become interns in companies: It can be very valuable for teaching a subject if the teacher works in one of the training companies for a few days or even for a week. This way he will get a very good idea of what his students are actually doing in their work. He might come into contact with new technologies or programmes which he can later integrate into his teaching.
- Use options for further education: Teachers can and should read new literature on professional teaching and, if possible, take part in further education programmes for teachers, e.g. on action-oriented teaching or new teaching methods.

6. Evaluation of teaching – quality of teaching

The term evaluation means assessment or appraisal. To evaluate teaching, we can assess various different aspects: the lesson plan, the lesson itself or its result with regard to the students' learning results. Instruction can be assessed from various different perspectives: that of the education system or ministry of education, that of the trainers of teachers, that of teachers or that of students.

We will first look at the evaluation of instruction from the perspectives of the education system, the trainers of teachers and the teachers themselves. In order to determine whether something is good or not, we need a set of evaluation criteria. Such criteria exist for teaching. They are also called quality criteria of teaching. Instruction that meets a large number of these criteria is likely to produce good learning results in students. It is important to note that some of these criteria can occur at the same time in lessons, whereas others cannot be carried out simultaneously, because they have different goals.

In German specialist literature, there is a large degree of consensus about which quality criteria teachers should aim at. There are two groups of authors who have summarised these results. On the one side, there are Hilbert Meyer and his co-authors, on the other, there is Andreas Helmke. Hilbert Meyer (2004) sums up a list of 10 quality criteria:

- Clear structure of the process of teaching and learning
- Intensive use of learning time
- Consistency of decisions concerning goals, content and methods
- Variety of methods
- Intelligent practising
- Individual encouragement
- Atmosphere of learnability
- Meaningful teaching conversations
- Student feedback
- Clear expectations and monitoring of performance

Helmke (2010) sums up these criteria of teaching quality:

- Guiding the class
- Clarity and structure
- Consolidation and securing the outcome
- Activation
- Motivation
- Teaching atmosphere that promotes learning
- Student-orientation
- Competence orientation
- Dealing with heterogeneity
- Variation of options

There is a large amount of overlap between these two lists of criteria, i.e. the criteria are not totally different. In the following, only the first catalogue of quality criteria will be dealt with in detail. These criteria are complemented by observable behaviour or activities in lessons. This makes it easier to assess instruction, because in the descriptions, observers receive suggestions of concrete elements that can be observed. The quality criteria can be transferred onto observation sheets, where persons evaluating a lesson can note down their observations. A template of an observation protocol is included in the appendix.

6.1 Quality attributes of instruction according to Meyer

In the following, the quality criteria of teaching according to Meyer (Meyer, 2003, pp. 36-43) will be presented. Each attribute will be briefly described in one sentence. This is followed by a list of indicators, i.e. behaviours or activities that can be observed in classes when the respective quality attribute is met. Some attributes will be complemented by tips or suggestions.

1. Clear structure of the process of teaching and learning

A lesson is clearly structured when teachers and students can recognise a common thread.

Indicators:

- the teacher uses clear language
- clear roles for everyone involved
- clear setting of tasks – students know what their task is at all times
- reasonable subdivision of the teaching content
- individual teaching steps are marked
- clear body language and direction of the room by the teacher
- good preparation and timely provision of learning materials

→ especially important for students with learning difficulties

Suggestions:

- Informative start of the lesson
- Precise preparation
- Rituals and rules
- Connect new content with elements that are already familiar (repetition, practice exercise etc.)

2. Intensive use of learning time

The real learning time is the net time a student actually works on the set task.

Indicators:

- Students are actively involved.
- Students do not get distracted.
- The results of the work meet the requirements of the set task.
- There are only few disturbances of discipline.
- The teacher does not wander off topic.
- The teacher does not disturb the students in their learning.

Suggestions:

- Clear specification of time
- Remove activities that have nothing to do with learning
- Smooth interventions by the teacher in the case of disturbances (deal with minor disturbances without fuss)

3. Consistency of decisions concerning goals, content and methods

The consistency of decisions concerning goals, content and methods is achieved by observing and balancing the "inner purposefulness" of goals, content and methods.

Indicators:

- Consistency can be observed when students accept the learning goals set by the teacher as their own.
- The methods used seem suitable for reaching the learning goal.
- Good timing.
- Internal differentiation: both stronger and weaker learners are given a chance to get involved.

Suggestions:

- Detailed didactic analysis
- If necessary, the planned course of the lesson can be corrected.

4. Variety of methods

A variety of methods means making use of the whole range of available staging techniques, process and activity patterns of teaching, varying the forms of instruction and practicing different basic forms of teaching (workshop teaching, individual work on a handout, group work, projects etc.).

Indicators:

- Mixing forms of student grouping will produce the best cognitive and social learning effects.
- A combination of workshop and situated learning (where students construct their own knowledge) promises the greatest success.
- Do not be afraid of mixing methods – two thirds of all classes are still taught using frontal teaching.
- Make sure that the method you use promises to achieve your goal!!

5. Intelligent practicing

„Practicing is the repetition of an activity with the aim of learning to do it better!“ (Dictionary of Pedagogics 1913)

Suggestions:

- Practicing becomes more successful if the subject has a subjective significance for the students,
- when a positive emotional attitude is created,
- when methods of practicing are varied,
- when different elements with similar structures are not introduced at the same time or following each other directly,
- when the exercises are repeated at regular intervals. These intervals should be very short at first and then be extended.

6. Individual encouragement

Individual encouragement means that teachers pay emotional attention to students, that they diagnose each student's current learning level and that they differentiate between students' individual learning needs and interests.

Individual encouragement is required for all students, not just those who are under-performing. These students require help with basic learning strategies and method competence, in order to increase their knowledge and skills.

Academically strong students should be motivated to expand their specialist knowledge and to become more practiced in applying methods and learning strategies.

Suggestions:

- Teachers should analyse current learning levels and note the competence level, learning process and strengths and weaknesses of each student.
- Develop learning strategies for students:
  - Repetition strategies
  - Elaboration strategies (autonomous structuring and connection with existing knowledge)
  - Monitoring strategies (students monitor gaps in understanding and learning deficits)

Methods:

- Flashcards
- Strategy cards (charting a solution from a task's beginning to end)
- "Cognitive modelling" by the teacher

7. Teaching atmosphere of learnability

The term "teaching atmosphere" describes the "humane quality of the relationships between teacher and students and between students".

A teaching atmosphere of learnability is characterised by:

- A joint orientation towards the tasks set in the lesson (= a positive working attitude)
- Responsible treatment of people and equipment
- Fairness
- A contented and cheerful basic atmosphere
- Politeness and respect.

The study of teaching and school atmosphere is a research field of its own. All studies confirm that a positive atmosphere promotes cognitive and social learning. Areas of research include:

- Concepts of self-efficacy: I can only reach a learning goal if I am convinced that I will reach it.
- Girls have a greater need for a positive teaching atmosphere and an attitude of support and cooperation by the teacher than boys, particularly in mathematics and natural sciences.
- Forming interests: If students have a positive experience in class, it will more often lead to the formation of interests within and beyond the subject.

Results from recent neurological research (Roth 2001) underline these psychological findings:

- The teacher's authenticity is assessed within one second. It is a prerequisite for learning. If the teacher is perceived as unauthentic, it becomes difficult for students to remember new knowledge.
- In the amygdala (a region of the brain) the emotional conditioning of all newly acquired information takes place and will never disappear again.
- If something is learned successfully, the brain will emit opiates which help the newly acquired knowledge to be remembered.

Suggestions:

The atmosphere is chiefly created by the students. Teachers can help them here, for instance by making an effort to remain authentic and sincere, by being fair but not too critical. There are several methods of classroom-management that can help to stabilise the atmosphere. Among them are:

- Working with methods of conflict resolution (e.g. mediation)
- Feedback
- More participative management
- Agreeing on "targets" with individual students or the whole class
- "Meta teaching" (= lessons on teaching) to clear up misunderstandings and to sound out alternatives.

8. Meaningful teaching conversations

Meaningful teaching conversations are conversations that create meaning for students by

- connecting existing knowledge with new knowledge and
- allowing students to include their own interests in the treatment of the given topic.

Indicators:

- Students involve each other in conversations.
- They sum up the subject matter in their own words.
- They have no problems answering transfer questions.
- They ask critical and additional questions.
- They draw on topics from earlier lessons on their own initiative and incorporate them into the new topic.

Suggestions:

- Give enough space and time to the conversation, so that previous experiences, feelings and attitudes on the topic can come up.
- Help students to develop wrong answers into right ones.
- Gather enough knowledge of related topics and introduce examples from these topics.
- Make sure that the various forms of conversation are applied (teaching conversation, asking-development teaching, discussion among students, examination), each with its specific forms.
- Make sure that a teaching lecture does not get continually mixed with a teaching conversation.

9. Student feedback

Student feedback is a methodologically controlled procedure of quality management in teaching, which uses student feedback on the learning process.

Feedback should never be a one-way street: Students and teachers should agree on mutual questions and evaluation criteria, rules and methods in order to collect useful information on successes, barriers and failures of learning.

Suggestions and examples:

- **Closed written procedures**, e.g. questionnaires: Students fill in a questionnaire at the end of each second week of teaching. It could be standardised (checking questions or giving points) or more open in form. The results are discussed on the following Monday.
- **Anonymous survey on cards:** e.g. with the two most common questions: "What should stay the way it is?" and "What should be changed?"
- **Role negotiations:** Students talk about which behaviour of the teacher they find helpful and which bothers them. This is followed by a response by the teacher and a binding agreement on (mutual) rules of behaviour.
- **Learning journal:** Students make entries into a journal at regular intervals, reflecting their learning process. Teachers collect the journals of students who would like them to see the feedback, and together they evaluate them and discuss the consequences.

10. Clear expectations and monitoring of performance

Expectations of performance are verbal and nonverbal notices and agreements on learning goals, tasks, methods and the level of target achievement.

It has long been empirically proven that friendly and clearly communicated expectations of performance increase learning success. And it has also been proven that general pressure to perform makes it difficult to learn.

The learning process cannot only be benefited by verbally expressed expectations, but also by body language and emotional attention. This has been proved by the Pygmalion experiment.

Clear performance monitoring complements the clear expectations of performance. It is a necessary tool to secure learning progress.

Performance checks are procedures, either specified by the teacher or agreed upon between teacher and students, which can formally or informally assess the individual or the collective learning process.

Performance monitoring should not discourage students, but rather encourage them to continue working. They should be designed to also enable weaker students to achieve something and be successful. That is why performance monitoring should be prompt and transparent.

Suggestions:

- Reports of learning development
- Verbal assessments/ Assessment conversations
- Assessment curves/ Diagnostic curves
- Portfolio

Appendix

Part 1 Basic Formulas for Lesson Preparation

Basic Formula 1. Learning something: „Facts, facts, facts!“

Goals

- The class has to learn a predetermined amount of new knowledge
- Following this, the success of this learning has to be checked
- Finally, this knowledge may have to be applied in other circumstances.

Phases of the lesson

- Warming-up: the topic and its meaningfulness are introduced (its connection to reality, e.g. by describing a case or an experiment)
- “Elaboration”: Introduction/ presentation of a situation or of facts
- Checking performance: Practice, check, give feedback
- Application to another case. Make sure that knowledge transfer is required
- Discussion of open questions.

The teacher’s role

- He gives information (e.g. through a lecture, a film, a text…)
- He monitors (e.g. by the method of exploration through questions, by using work sheets…)
- He gives support during the working phase (possibly by differentiating within the class, e.g. by giving extra exercises to faster students).

Methods and student grouping

Phase	Method/ Student grouping/ Suggestion
Instruction/ Warm-up	• Direct teaching/ Presentation by the teacher • Start with a case, experiment or problem that can only be solved with specific knowledge (!)
Elaboration	• Do not use the method of exploration through questions (see below for explanation) • Presentation by the teacher • Use media, e.g. texts • Group puzzle • Learning stations: make sure to also include stations for relaxation.
Practice	• Individual work whenever it is essential that all students master the skill in the end • Partner work may also be useful for difficult topics • Exercises with varying degrees of difficulty/ Additional exercises for faster students
Monitor performance	• Students quiz each other in various forms, such as - Ball bearing method with pre-set questions ("Now explain to each other how..."/"Quiz each other on how...") - Use quiz games
Transfer	• Purpose: Switch to another level of taxonomy; this also serves to monitor what has been learned • Prepared group-work (first individual, then group-work) • If frontal teaching were to be used here, only a few students would have the chance to participate.

Take note/ pitfalls

- If the content that has to be learned is really new, it does not make sense to ask the class a lot of questions in the beginning, or to start the lesson by exploring through questions.

- It might be more useful to activate previous knowledge or to refer to content that has already been discussed and that will be important for what is to follow. Previous knowledge could for instance be collected in conversation with the class and fixed (on a transparency or blackboard). This can be built upon in a presentation.

- It is vital to define what knowledge must be built upon! If necessary, start with an extensive phase of repetition.

Another alternative: the genetic procedure

- The goal: introducing a complex problem
- This is achieved by presenting the historical emergence and treatment of the problem.

In brief: Example "Indirect speech"

To begin with, the teacher presents three sentences on a transparency ("Imsel is ill", "Imsel says that she is ill", "Imsel said that she had been ill"). The moods of verbs were treated in the previous lesson. The students are asked to explain the different meanings of the sentences. If necessary, the teacher helps by giving a short explanation.
Students are given a rule-sheet on indirect speech.
Practice: Students first work on a sheet in partner work. After this exercise has been discussed together, students work individually in order to secure the new knowledge.

Basic formula 2: Solving a problem (focus on solutions)

Goals

- A pre-set problem that could occur in real life is presented and has to be solved
- Finding the right path to solve the problem is significant and so the ability to solve problems is also an essential goal.

Phases of the lesson

- Warming-up: The basic problem is introduced and its relevance is explained. This way, students can develop an interest and become motivated. An experiment could also be used. The question would then be how to explain what just happened
- If necessary, provide necessary knowledge (info sheets, lecture etc.)
- Solution processes are developed and evaluated
- Individual steps are secured (e.g. by noting them on the blackboard or transparency)
- Consolidation and application to another problem.

The teacher's role

Getting started

- He presents the problem and gives additional information if necessary.

Development phase

- He gives support and advice if necessary.
- Perhaps he takes notes.

Inductive or deductive?

- Deductive: First, introduce a general principle, a rule, a natural rule etc. From this point of origin, special information will be deduced, or the general rule will be applied. ("Transfer XY to other situations", "Solve the case examples with the help of the laws we just covered").
- The deductive procedure is a little more difficult, but it is very helpful when the rules cannot be deduced inductively, but are simply given.
- Inductive: You begin by presenting a problem and derive rules from it together with the class.
- The inductive procedure is very helpful when you are dealing with ethical questions. So you could for instance introduce a case of environmental politics, from which the class derives ethical principles.

Methods and student grouping

Phase	Method/ Student grouping/ Suggestions
Introduction / Warm-up	• Direct teaching/ Lecture • Warm-up, e.g. a case, experiment or problem is introduced: the class deals with a problem that needs a solution. • A provoking statement could also be a good way of getting started ("The devil's advocate" – the teacher takes an extreme position to provoke).

continue next page

Phase	Method/ Student grouping/ Suggestions
Development/ Evaluation	• Check which information is needed to solve the problem. - Either necessary information is given right away - Or students ask for it successively, as needed (internal differentiation) • Collect ideas: Open methods, methods of association. Student grouping: individual work is most suitable; if there is exchange at all, it could be through a "circulating sheet". - ABC-method - Brain writing - Mind mapping - Survey on flash cards • Focus ideas: Change to partner or group work. On the basis of the previous phase, now... - hypotheses, suggestions for solutions and actions are formulated - You can be creative in the way you present this ("The ten commandments of waste management..."). • Evaluate ideas: Plenum - e.g. survey of points
Reflection	• Conversation in the class/ exploring through questions: reflect on the solution process • Secure results on this aspect
Transfer (Consolidation/Application)	• A similar case is presented and students are asked to find a solution by themselves or with a partner.

Take note/ pitfalls

- It is not enough to say „Solve the problem"! When structuring the lesson, it is important to either discuss individual steps with the class or to determine them.

In brief: Example of „The dual education system 2.0"

The teacher introduces the issue by explaining that there is no dual education system in many countries and that therefore there is on-going discussion in Germany as to whether it is still necessary there. Students form groups and are given the following material:

1. A sheet with various quotes on vocational training
2. Exercises that will structure their work and determine a series of steps

The working groups create a poster wall on which they present their solution.

Afterwards, there is a presentation following the museum method: one student stays with the group's poster and explains it, all the others walk around.

Optional consolidation: Problem or events are presented for discussion and new groups are formed. These groups think about whether the form of school they have talked about could deal with these problems or events.

Securing the results: Photos of the wall-posters are taken and made available to the students.

Basic Formula 3: Discussing a problem (focus on opinion)

Goals

- Students develop an opinion and present it
- Students listen to other positions
- Students repeat other positions without bias
- Students compare opinions with regard to certain criteria (e.g. social compatibility, consequences etc.).

Possible phases of the lesson

- Warm-up: the problem is presented. Necessary background information is provided.
- Students develop their own opinions
- They present their opinions
- They discuss their opinions
- They deal with different opinions: possibly by repeating/ analysing/ evaluating an opposing opinion.

The teacher's role

- The teacher creates a framework (e.g. by giving basic information)
- The teacher stays in the background and gives room to the discussion
- The teacher delegates as much as possible to the class (such as supervision of time during the group work phase or supervision of manners during the discussion).

Methods and student groupings

Phase	Method/ Student grouping / Suggestions
Introduction/Warm-up	• Direct teaching/ lecture • Warm-up, e.g. a case or problem is introduced: the class is asked to take an argumentative position on a problem. • A provoking thesis could also be a good way of getting started ("The devil's advocate" – the teacher takes an extreme position to provoke).
Development/Evaluation	• Investigate which information is necessary in order to discuss the problem seriously. • Since the focus of the lesson is on discussion, it makes sense to provide the necessary background knowledge, e.g. in the form of a collection of material or a reader. • *Finding one's own position:* open methods, methods of association. Student grouping: individual work is most suitable, if there is exchange at all, it could be through a "circulating sheet". However, it may also help to use more affective methods. If the issue is easily accessible, it may be possible to start the group work phase straight away (if you think that individual reflection is not necessary). - Brain writing - Mind mapping - Journey of the imagination - Kiosk of images... - Headstand method • *Presenting and discussing one's opinion:* Here it makes sense to change to group-work (big enough for an exchange of ideas, but not too big – everyone should be heard). Partner work or work in triads is also possible. - Collect, order, weigh, process and present positions - Fish bowl • *Panel of experts:* In this method, the point of view is predetermined by assigning roles (the class could for example be divided into groups according to their interests. This could be followed by a discussion where each group appoints a speaker. The other students are asked to observe and/or take notes). • *Dealing with different opinions* (see the debate on dilemmas according to Lind and the method sheet on the educational mandate
Securing results	• In order to secure the results, the class could be asked to write an appellative text (such as a leaflet, a speech etc.) .

Please note/ Pitfalls

- Discussions without securing results can go wrong. There should at least be a phase of reflection.

Further suggestions

- In discussions, it is nearly always worthwhile to follow this procedure:
  - List the protagonists (if the discussion deals with the abolition of conscription, this would be young men, the army, hospitals, employers etc.)
  - Find arguments from this perspective.
- It might also make sense to use a dialectic procedure where first one side and then the other one are introduced, before trying to reach a synthesis.

In brief: Genetically modified food

To begin with, a relevant newspaper article is read aloud or results of a survey on consumer demands are presented. The teacher introduces the question. Volunteers are handed out role cards for a podium discussion. Each volunteer is assigned a group of supporters and together they assess pre-existing material for arguments in favour of their assigned role. This is followed by a podium discussion moderated by a student. Reflection session: everyone notes down the four arguments they found most convincing, some of these are read aloud.

Basic Formula 4. The journey inwards – to understand oneself

Goals

- To reduce the probability of an unrealistic, superficial discussion, students are invited to reflect their own attitudes, feelings etc.
- These goals belong to the area of personal competence. The aim is self-exploration.

Phases of the lesson

- Getting started: The goals and opportunities for learning are disclosed. Rules are made transparent (e.g. „nobody will be laughed at“, „you will not have to may not or want to read out everything you note down today…“).
- Warm-up: an affective approach to the topic, for instance by telling a story.
- Examination: individual work on the topic.
- Conclusion/ sharing: give space to the need to talk, evaluate the results (see below).

The teacher's role

- You offer opportunities for reflection.
- You provide a protected space, for instance by making sure that not all results have to be presented publicly in the class.
- You stay in the background!

Methods and student grouping

Phase	Method/ Student grouping/ Suggestions
Introduction/Warm-up	• Direct teaching/ lecture • Warm-up: it is important to create a space where individual and affective discussion is possible (see above). • Form: Tell a story, present a short film, give an impulse, play music, present a symbol…
Examination	• Creative methods for individual work and examination: - Journey of the imagination - Creative exercises: Write a poem (e.g. a haiku – instructions can be found on the internet), draw an (abstract) picture - Write an associative text, e.g. brain writing - Suggest open questions for reflection: "What are your experiences of XY?", "What is it like for you to experience XY?" - Work with symbols and rituals: "Find an object that reminds you of XY." - Work with files of images: "Select an image that expresses XY for you."

Phase	Method/ Student grouping/ Suggestions
Continuing work	• To continue this work, group work provides a more protected space than the entire classroom, so that small groups talking to each other could be used as an intermediate step ("Tell each other in groups of three... What else would you like to discuss with the whole class?"). • When the discussion moves to the plenum, it could be useful to sit in a circle of chairs. • When the discussion deals with feelings, remember that not everyone is equally willing or able to discuss their inner life. It is therefore important to talk about the many facets of experience. A statement like "I am angry" will probably include more feelings than just anger, e.g. insecurity, desperation etc. • When working with creative exercises, there is always the danger that not everything of value gets equal appreciation. Here are possible procedures: - Switch to the meta level (Students were asked to think about "family" and to draw a picture. Round of collection: "How did it feel to draw this picture?", "What questions came up when you thought about this topic?" - Protected presentation in small groups or partner work. - If the topic is not too personal, it could make sense to use a variation of the market-place method.

Take note/ Pitfalls

- There is a danger that the lesson could turn into a "general chat". It could be important to reach a concrete result at the end.

In brief: „Displacement and exile“ – Grade 12

The teacher introduces the lesson by presenting an object that represents the idea of “home” to him personally. Students note down associations on the topic of “home” (“word factory”). On this basis, students write a poem or a short essay on the topic of “home”. These texts are exhibited and discussed among the class.

Final round: (1) The topics of “Displacement and exile” are at the centre of a mind map (blackboard/transparency). “Name other topics that could be important in this context.” (2) “What other questions do you have? What aspects of this topic interest you?”

Basic Formula 5. Research and presentation (also as a project)

This formula focuses on social and method related competence.

Goals

- Students develop efficient methods of cooperation.
- They research with target-orientation, they evaluate and process information.
- All topics that the students can develop by themselves are suitable. Topics where the aim is mainly to understand and apply knowledge are less useful for this formula.

Phases of the lesson

- Present the problem.
- Research
- Process
- Present/ Evaluate: Especially if the preparation was done in groups, it suggests itself to include the entire class in the evaluation. Of course, transparency is important here - you are ultimately the one who gives the grade!
- Continued work: In some cases, the presentations could be followed by an expert round. If possible, the dimensions of the presentations should be limited; otherwise, you and your class will do nothing else for weeks.

The teacher’s role

- You will provide the general conditions and plan the tasks carefully.
- During the work phase, you will merely be there to give advice.

Methods and student grouping

Phase	Method/ Student grouping/ Suggestions
Introduction / Warm-up	• Direct teaching: This will be mainly about determining forms and rules of the work, e.g.: - How much time is allocated? - Which resources will be provided (rooms to work in, materials)? - Are students allowed to leave the school building during school hours? - In which form should results be presented? - How will group-troubles be dealt with ("My hard drive broke down.", "We can't work today because XY isn't here/ forgot the documents at home")? - How will the performances be measured and assessed? - Do the working groups have to assign roles and declare them openly? - Should intermediate results be presented? In which form and when?
Working phase	• Methods - Survey - Internet research / Research in a library - Interviews (e.g. of experts, contemporary witnesses) - Excursions
Presentation	• Presentation in class - One group after the other - Market-place method • Presentation in front of other audiences (parallel class, parents, at an open day) • No presentation, but other creative products, e.g. a letter to the editor.
Reflection	• The working process is reflected, group members give each other feedback on their work attitudes. • You as the teacher tell the class how you saw the working phase. • It is worthwhile to reflect the roles within groups or teams. This could take the form of self-assessment at the beginning or self- and external assessment at the end.

Take note/ Pitfalls

- If your students are to work without you for extended periods, they will need a very precise task, including intermediate steps etc. (depending on how much practice your class has).
- It is nearly impossible to conduct a 45-minute internet research with really useful results. If you decide to try this, it will be necessary to provide certain pages.

Part 2 Suggestions for getting a lesson started

Present an experiment

This is a useful way of getting started, not only in science lessons: You can either conduct the experiment yourself or bring a film. Another method is to conduct a sociological or psychological survey in the class and then to compare the results with representative results.

Tell a story or talk about an experience

The narration also functions of an informative beginning, e.g. it can explain the topic's relevance or present problems which then become the lesson's topic.

Impulses for beginning

The teacher confronts the class with one as the following, without further comment:

- a short sentence (an aphorism, a line from a poem, a striking quote from a different work),
- an image,
- a caricature.

It is important to note:

- The medium: Blackboard, transparency, reading aloud (this is less suitable, because the item is not visible for the rest of the lesson) or playing back from an audio-resource.
- Selection of the sentence or caricature
  - Concision: The aim must be as clear and unambiguous as possible.
  - Moments of surprise and provocation are helpful.
  - A contradiction could be constructed and the aim of the lesson is to resolve this contradiction (see Meyer, UnterrichtsMethoden, Vol. 2, p. 138).
- The use of ambiguous texts, images etc. If it is your aim to collect topics, for instance, you could intentionally choose an ambiguous or open silent impulse.

Continued work

- Students express their thoughts in a round conversation.
- Setting the lesson's topic and the learning steps (together).

A short film to begin with

A short film can also give a new impulse if

- its message is clear, if it leads up to the topic without equivocation and if it doesn't open too many other issues,
- it provokes and
- presents aspects that are not immediately obvious.

You could also set some observation exercises. Thömmes suggests an interesting variation where students formulate questions that came to them when they watched the film and that they would like to discuss in the lesson/ unit.

see Thömmes, p. 65.

Keynote presentation to get started

Description

At the beginning of the lesson or unit, the teacher gives a short keynote presentation:

- it defines the most important aspects of the topic that will be covered,
- it gives an outline of the course of the unit or lesson,
- it raises questions rather than answers them,
- it highlights the relevance of the topic for the students,
- it is presented in a lively and motivating manner.

The more visualization the presentation provides, the more likely it is to make an impact: Use images, screen presentations, transparencies etc.

see Thömmes, p. 54.

Survey results

The students are introduced to survey results that raise a question.

Present a report

A report that you developed, either alone or with students, introduces the new topic.

- It could be designed like a newspaper page (as a transparency or copies). Students formulate their observations and develop questions that will render the lesson's content more concrete.
- A fictional dialogue between people who are involved in the topic.

It is important that these elements raise questions rather than providing answers. *see Meyer, UnterrichtsMethoden, Vol. 2, p. 137.*

Topical Map

Could be designed like a mind map or a menu and serve as a beginning for more than one lesson. It could present what has already been dealt with and what is still to come. The appropriate media (e.g. transparencies, poster, presentation wall, copies) could be designed with the students, as the beginning of a unit. *see Meyer, UnterrichtsMethoden, Vol. 2, p. 137.*

Part 3 Teaching methods

The lecture by the teacher – teacher information

Basic rules on lectures by the teacher

1. Speak clearly and distinctly.
2. Remember that your audience is made up of students. Choose your wording, syntax and intelligibility accordingly and tie in directly with their previous knowledge.
3. Reveal the aims and purpose of the lecture at the beginning.
4. Make sure to use visualization (transparencies, or a mind map that you develop while you speak…).
5. Give structure to your speech and display this structure (e.g. by using an advance organizer, a poster that illustrates how the content is organized).
6. Use the lecture as a school of thinking as often as you can, by demonstrating your thought processes.
7. Secure results (e.g. by a worksheet, questions to check results…), also through repetition.
8. Do not speak for too long (about 5 to 10 minutes, according to the age of the students).

see Good/Brophy 1994, Chilcoat 1989, McCaleb/White 1980.

Unwanted side-effects of a lecture by the teacher

- Students adopt a passive-receptive attitude
- Teachers often assume that the presented attitudes are perceived with 1:1 equivalence in their students' heads.
- Students get bored.
- It is impossible to differentiate.

The asking-developing method – the class discussion (with guidance by the teacher)

Basic rules for asking-developing method

1. Make sure that it is not always the same students who speak ("diversification").
2. Your questions should be broad rather than narrow.
3. Avoid suggestive or chain questions.*
4. Allow for some time – first after you have asked your question and then when you call on someone who might not answer immediately.
5. Give qualifying feedback (more than just "mmm", "yes"…): Some answers are wrong or ill-conceived, others may be creative etc. Talk to the students

and differentiate: “There are two aspects to your answer. Your claim of XY is wrong, because... But the other part of what you said adds another observation to the discussion and that is....”).
6. Use body language: a questioning facial expression, a doubtful look, surprised eyes...
7. Create connections and references: “This ties in with what XY said before”, “This is a new aspect, let’s follow up with what XY said first”. Or let the students make these connections.
8. Adapt your role and your behaviour to the character of the conversation: anything from a strong presence to mere moderation or even silence could be appropriate.
9. Make sure that results are secured (blackboard, transparency, summary at the end).
10. Stick to your goal: This method tends to let the conversation get out of hand and lead nowhere. To avoid this, it is helpful to remain aware of the goal of the conversation.

* Suggestive questions already imply the answer (“Are there any other arguments?”); chain questions are rows of several separate questions. The danger is that students are no longer sure which of these questions they are asked to answer.

Collection of methods for finding out about students’ prior knowledge and opinions

Brainstorming

With this method, many ideas on one topic can be produced within a very short time.

Execution: The topic is set by the teacher or agreed upon with the class. Then the topic can be written on the blackboard or visualized on a poster (e.g. on a moderation poster). The rules of brainstorming should be explained by the teacher or written down somewhere, visible to everyone:

- Ideas are called out and written on the blackboard by the teacher.
- Students can let their imagination run free.
- The other students do not judge anybody’s ideas.
- Ideas can be picked up and developed further (Thal/ Ebert 2004).

Suggestions: If you have a large group, don't apply this form of brainstorming with the entire group. Rather, give one or two moderation cards to each student and ask them to note down one idea, term etc. on each one.
After a short period, collect the cards and pin them to one or (better) two presentation boards. Include the class by asking them to help you to categorise similar or related terms next to each other, or above and below each other. Once all the cards have been pinned to the board, you can form clusters and mark them (e.g. by drawing a circle around them with a thick pen). Each cluster can be defined by an umbrella term. As an alternative, you can create a mind map with your students, on the blackboard or a poster. The poster with the clusters or the mind map can stay on the wall after the end to the lesson or unit, to enable you to constantly refer to the ideas and terms that were collected at the beginning.

Photo association

The method of photo association (Thal/Ebert 2004) helps to explore a topic with the help of previously collected photos. These photos can be selected with regard to the topic's essential aspects.

Execution: Photos that can be associated with the set topic are spread on the floor or on a table. The students walk around and choose the photo that most closely represents their personal attitude to the topic. You should provide around 25% more photos than there are students in the class, so that students have a choice.

Suggestion: You could cut the photos from newspapers or magazines, or you could use postcards or posters. You can select photos that only have a vague association with the topic. The students' creativity and imagination can unfold here and it is often these kinds of photos that produce the best contributions by the students.

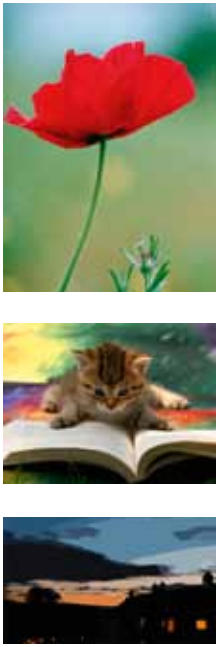


Fig. 37: Photo association

Examples: Which one of these photos most closely represents my attitude to the topic "being healthy/ being sick", "democracy", "addiction and pleasure"? Afterwards, students sit in a circle and each participant gets the opportunity to present their photos and to explain why they chose them and what they feel about them.

Alternatives: As an alternative method, you could ask students to create collages from images, drawings and texts (e.g. large headlines from newspapers or magazines). These collages could remain in the classroom while the topic is being investigated and you can refer back to them if needed.

One point question/ My standpoint

The one point-method (Hugenschmidt/ Technau 2002) can be applied when starting a new topic. This method helps to illustrate the class' current opinions on certain issues. It also serves as an introduction to a new problem field and can help to get the discussion started. Individual students can communicate their opinions anonymously. Trends and conflicts become visible and the interpretation of the point-image is a first group result.

Execution: At first, you should prepare a scale. The one-point question should be visualized on the presentation board. The teacher introduces the method and explains the rules (Hugenschmidt/Technau 2002, p. 52).

- Each participant receives a point.
- Participants make their decisions individually in their seats.
- Participants come to the front together and place their points.

Procedure followed by the moderator (teacher):

- read out the question, explain and justify the content in detail;
- explain the answering procedure, give an example of an answer;
- ask the group whether they understood the answering procedure;
- ask the group to place their points together;
- count the points and note them down with a thick black marker;
- point out clusters and variances, no judgment by the teacher
- ask the plenum to interpret the point image; write all comments and shout outs directly onto the moderation paper;
- if there are contrasting opinions, draw a flash and note down the opposing opinion too.

Suggestions: Some participants may find it hard to decide. They could find the suggestion helpful that this is just a temporary decision and not meant to stay the same forever. This method can cause the class to become rather noisy and scattered for short periods of time. Still, the decision should be up to the participants, do not intervene. If the participants should begin to discuss the subject in too much depth at this point, explain the procedure. When the moderator evaluates, some of the participants might feel exposed.

Alternative: A similar method is called „My standpoint" (Thal/Ebert 2004). To prepare, the classroom is divided into two halves lengthwise by a tape or a chalk line on the floor. The students stand in a row on this central line. Now statements on a predetermined topic are read out. The students are asked to literally take a position on this statement. The central line symbolises a neutral attitude. The walls of the room on both sides of the central line symbolise total agreement and total disagreement. By moving further from the central line towards the walls, they express their agreement or disagreement.

This diagram shows a possible distribution of students on a statement:

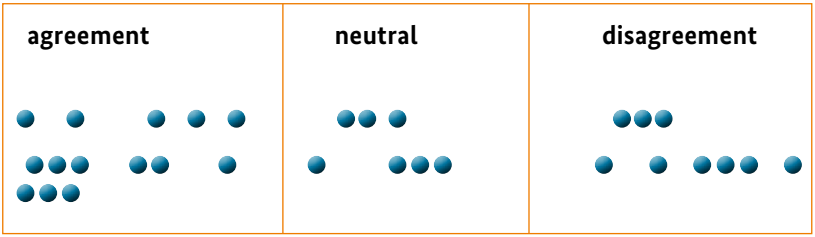


Fig. 38: One point question/ My standpoint

Once all students have assumed their standpoint, it becomes possible to examine the motives for the positions taken and to exchange pro and con arguments.

Suggestions: In order for this method to work, the statements have to be concise or even provocative, so that discussion processes can be set in motion. This is a good exercise to illustrate students' opinions and knowledge on a specific topic. The fact that the standpoints are visible to all can really stimulate the discussion. (Thal/Ebert 2004).

The same method can be used to repeat already learned material. In that case, the central line divides "right" from "wrong". After the statement has been made, students move either to the side of "right" or "wrong". Examples:

- Arithmetic: Set a problem: e.g. 15 x 15 = 195?
- Languages: Describe characters from literature, e.g. Macbeth is an ambitious character.
- History: One of the triggers for the 30-year war was the "Defenestration of Vienna".

Avalanche

This exercise (from Thal/Ebert 2004) gives students the opportunity to hear different opinions on a topic, to examine them and to exchange arguments. At the end of creating an avalanche, the most important arguments will be remaining.

Fig. 39: Avalanche

Execution: The topic is written on the blackboard, e.g. "In order for students to enjoy school, it needs to be/have..." As a first step, all participants work individually ("What is important to me personally?"), noting down the three aspects that they find most important. Afterwards they form pairs and talk about their thoughts. They are asked to agree on three aspects, which means that up to three aspects will be discarded. The next step is for two pairs to form a group of four, again with the same task. Following this, the results are presented and discussed in the plenum.

Written conversation

The following exercise was also taken from the book by Thal/Ebert (2004). It enables an intensive discussion among the students, but this time without any actual talking.

Fig. 40: Written conversation

Execution: Large posters or wall newspaper sheets and markers are laid out on tables. A question or statement has been written on the posters and students are asked to state their opinions. Small groups are formed. The members walk around the poster and write down their opinions.
The other group members can and should comment these and add their own, like in a spoken conversation. Gradually, a lively silent discussion develops. Afterwards, the posters can be presented and discussed in the forum.

Collection of methods for exploring new material

Apart from the already described methods of the lecture and the method of exploration by questions, there are many more methods that are suitable for the exploration of content or that can help to initiate a discussion.

Q&A session

This method is suitable for various phases of a lesson. Hugenschmidt/Technau (2002, p.67) list:

- consolidation of an area or sub-area of a subject;
- the exploration of new content;
- monitoring the achievement of learning goals;
- getting started on an area of learning.

Execution (according to Hugenschmidt/Technau 2002):
- Introduce the topic and underline the goal;
- Divide students into groups of 4 to 6;
- Explain the method.

Version 1:
- Each participant formulates a question on the topic and notes it down on a card;
- Afterwards, the questions are read aloud and discussed within the working group;
- Open questions are brought to the plenum and can be integrated in the further exploration of the subject.

Version 2:
- The participants produce one or more questions with the help of working materials (books, magazines, internet...) and write them on cards. On the back of the card, they note a possible solution;
- The cards are mixed;
- The members of the entire group sit in a circle. Each team draws a card and tries to answer the question on it;
- These cards (questions with their respective answers) can be used to build a learning data base.

Suggestions: The participants could formulate questions that are too narrow or too open, so the teacher should help them in the beginning. Participants should have sufficient previous knowledge to formulate enough questions (Hugenschmidt/Technau 2002, p. 68).

Headstand method

Fig. 41: Headstand

The headstand method can also be used for a variety of purposes. It can be applied for a warm-up or to explore problem-solving strategies. For example, it is suitable for finding the necessary behaviour for cooperative work.

Execution:
Explain the method:

- Present the problem
- Put the problem on its head – visualise;
- Brainstorming in individual work, partner work or small groups
  (a maximum of 4 persons) – note down results
- Look for counter solutions or develop ideas for the reversal, discuss and note;
- Present solution in the plenum using wall newspaper, role play, round table conversation etc.

Topic/ exercise: Young people in the professional world: Creating team work through social competence

1. Reversed idea (reverse the idea to its opposite): How can we successfully avoid cooperation?	**2. Possible solutions:** What should we do instead?
• Hide information, • Play members off against each other, • Spread itching powder on the desk, • Terrorise others on the phone, • Present someone else's work as your own, • Start rumours, • ...	• Agree on common goals and work together to achieve them, • Address conflicts and solve them actively, • Present results as a team, take turns to be the speaker for the group, • ...

3. Evaluation/ Suggested solutions

The groups work out a catalogue of rules together and find common goals that they would like to achieve.

Hugenschmidt/Techau 2002, p. 96

Collection of methods for repetition and securing results

The methods presented in the following chapter are suitable for getting a lesson started, for exploring content and for securing results.

ABC-Method

This method's central aim is to find a term, an idea, an opinion etc. for each letter of the alphabet that deals with the topic at hand. This method can be applied in the entire class, in partner work or in small groups.

Fig. 42: ABC-method

Execution: At first, every student thinks about terms, ideas or opinions which begin with the letters of the alphabet. These individual contributions are then brought together and consolidated, either with the whole class (on a large poster), in partner work or in groups. Students discuss the aspects that are connected with the topic. Terms that have a high significance for the topic are selected for the collection. Collecting the terms could lead to the application of other methods; for example, a mind map on the topic could be created to show the connections between the terms.

Time:

- 10 minutes for collection on the ABC-list
- 20 minutes for exchange in small groups
- 10 minutes for information in the plenum

Topic	
A	M
B	N
C	O
D	P
E	Q
F	R
G	S
H	T
I	U
J	V
K	W
L	X, Y, Z

Fig. 43: Template for the ABC-method

Carrousel discussion (Ball bearings)

Preparation/ Material

- Create a list of topics (either think of topics yourself or collect them from participants' statements, for instance from the preliminary talk). This list could also be developed as a plenum exercise.
- In groups where the participants know each other, "private" questions could also be used and copied as A4-sheets (= all topics at a glance) or as a notebook of topics (one sheet per topic).
- Arrange the chairs in an inner and outer circle, grouping chairs in pairs.

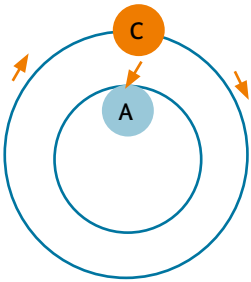


Fig. 44: Ball-bearings

Material: Sheet or notebook of topics (2 participants = 1 notebook), an instrument to make a sound with (bell, whistle, rattle...)

Execution

1. Divide the group into two halves and arrange them on the inner and outer circles.
2. Give the sheets of topics to the inner circle.
3. Participants decide on a topic or question and talk about it to their opposite number (3 to 5 minutes).
4. Sound a clear interruption (with a bell!).
5. Give the sheets to the outer circle.
6. The outer circle moves one place over to the left (right).
7. The participants from the outer circle decide on the topic of conversation, continue with 3.
8. Pass the sheets to the inner circle, move over...
9. Evaluate the exercise in the plenum.

Suggestions for evaluation (about 15 minutes)

- Which topics did I choose or avoid?
- Which questions was I asked
- What was the biggest surprise?
- Which topics did the group address more than once?
- Did I prefer to be asked questions or to decide on a topic?

Suggestions and tips: The lesson will be very lively and it could get quite loud. That is not a problem in itself, because the method leads to a lively activation and participation of (nearly) all members of the group. If the number of participants is uneven, leave one place free; one participant will always miss a turn. The outer and inner circles should take turns to move over, but it is important to pay attention to the direction they move in, so that there are always new pairs.

(http://www.learn-line.nrw.de/angebote/methoden/info/Methodenwerkstatt)

Mind mapping

This method uses associative thinking structures to reveal the interconnection and complexity of information. Scientific writing on mind mapping refers to recent brain research that deals with the use of both halves of the brain (Mogens 1992). Among its aims are the visualization of complex connections and the structuring of ideas, problems, projects, plans etc.

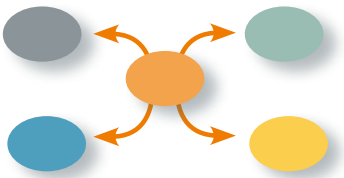


Fig. 45: Mind map

Execution: The problem is placed at the centre. From there, main branches lead off which in turn fork off into smaller branches and sub-branches. Each branch and each smaller branch is marked with a key word (mostly simple nouns). A main branch with smaller branches and sub-branches is called a complex. Individual keywords may be highlighted by symbols.

1. Write the topic or question in the middle of an A3-sheet of paper (use the paper horizontally).
2. Collect two, three or four central, overriding aspects of the topic and note them down as main branches. Do not worry if the list is not complete or accurate!
3. Collect all thoughts as they come, note down keywords, assign them to a main branch – or create a new main branch for them.

Role playing games

This method is particularly suited for organising learning processes in groups. It helps groups to make experiences together, to see the complexity of social perceptions and to reflect as a group. It enables the peer group to support each other. As a method of social learning, role play games need someone to direct them.

It is your job

- to create an environment where the fictitious reality of the game can create a fruitful and authentic reality for the actors;
- to protect the protagonists, so that they are not overwhelmed by impressions or feedback;
- to process the actors‘ and observers‘ authentic reality together with the participants, so that they can gain self-awareness and action-oriented competence.

Method 66 (Beehive)

This method can be used after a phase of information to collect questions, impressions, opinions and solutions or to secure learned content.

Fig. 46: Beehive

Execution: The participants form groups of six. These small groups receive a precise task with regard to the information they just learned. They have six minutes to exchange their thoughts. Afterwards, the participants bring their results or questions to the plenum.

.

Suggestions and tips: The results can be included into the following work as an instance of co-management of the learning process by the participants.
Please note: Participants tend to lose track of time when they are discussing with each other. Have them appoint someone to keep an eye on the clock.

Additional teaching methods – Large-scale methodical forms

Cooperative learning

Cooperative learning encompasses methods that encourage exchange between learners, for example pair work or group work, as well as group puzzles, projects in small groups, reciprocal teaching or teaching through learning and much more.

The rationale behind cooperative learning is that learning is considered a social activity, encouraging participants to communicate with and stimulate one another. It is therefore a form of interaction that enables people to acquire knowledge and skills by working with others and exchanging ideas. Research has shown that cooperative learning promotes motivation, social competence, independence and the acquisition of knowledge.

Cooperative learning makes certain **demands of students**:
- They have to learn to take responsibility
- They have to participate actively in the learning process
- They have to take problems into their own hands.

Planning and shaping group work

Well-structured group work can be divided into five phases:
Phase 1: The subject is presented in class.
Phase 2: The assignment for group work is set.
Phase 3: Small groups are formed.
Phase 4: The small groups work.
Phase 5: The results of the group work are presented to the class.

The results are evaluated and the class discusses how the work should continue.

The different groups can either work on the same subjects (group work on the same subject) or each group picks a different subject (group work on a different subject).

Group work on the same subject:

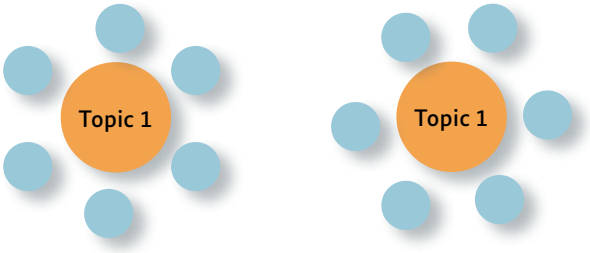


Fig. 47: Group work on the same subject

Group work on a different subject:

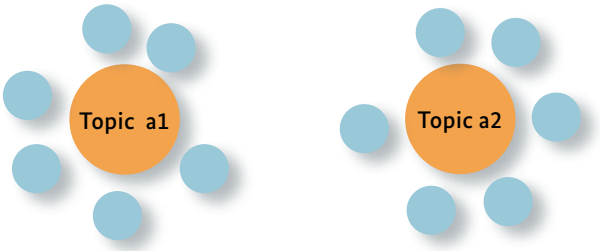


Fig. 48: Group work on a different subject

Furthermore, a difference can be made between group work where the work is the same: All members of the group tackle the same subject (e.g. Topic 1) and group work which is broken down into different parts: Some of the group members tackle a particular aspect of the subject while others work on another aspect.

Identical group work:

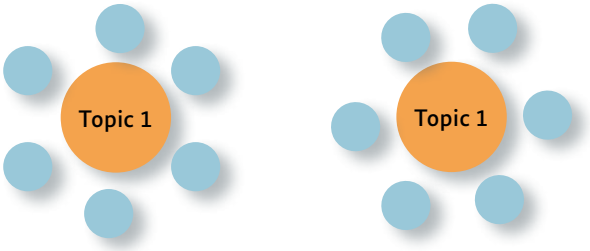


Fig. 49: Group work where the work is the same

Group work where the work is divided up:

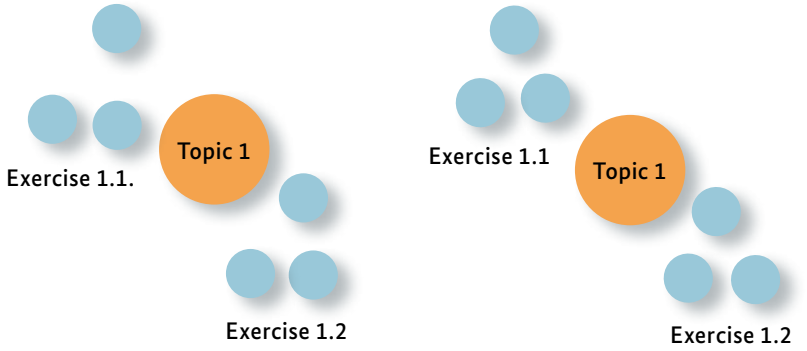


Fig. 50: Group work where the work is divided up

Ways of dividing up the groups:

It is important that groups be divided up in such a way that there is maximum success in terms of learning. The following possibilities exist:

- randomly (pulling cards, counting)
- teacher decides
- students decide
- interest in subject
- students decide according to their sympathies

There are classes in which it is possible to use a one-off group division more frequently. Although it can sometimes take a long time until group work is accepted, the effort is usually worthwhile because students tend to be active in groups and this should be the point of the work.

Different forms of presentation:

There are different ways of presenting the results of group work:

- A classic presentation: One or more people from the small group present their results to the class.
- Market-place: The results are posted on different presentation boards in the classroom. A member of each group stands by the presentation board and

explains the results if needed. The students walk around and look at all the results.
- Mixed groups: New groups are formed. Exchange between the members of different groups takes place next to the presentation boards like in a marketplace (see above).

Action-oriented methods

The following section presents the methods used in action-oriented teaching. The methods feature a high degree of student activity. Students are encouraged to work on subjects that have either been set by the teacher or chosen by themselves independently.

Project

Project-based teaching tackles real situations and items that are similar to those which occur in "real life". Learners choose an aspect from a topic area that they would like to work on. Project-based classes are relatively open and activities are not organised in small learning tasks and steps. Project-based teaching encourages cooperative behaviour. Learners help each other. The methods for dealing with problems and tasks from the area of activity are sometimes developed by the students themselves. Activity in project-based classes is understood as a rehearsal in school conditions. The aim is to achieve the goals in the area of activity. These can change during the course of the project, if this makes sense. In any case, the work has to be brought to a successful end. Often, a product that can be presented is the result.

Frey's project method

According to Frey the Project Method has **five characteristic features**:

a) **Project initiative:** A project begins with somebody introducing an idea, a task, a particular mood, a problem, an experience or a desire to carry out a certain activity to the group. Essentially, this could be anything, because an important feature of the project method is that the outset has to be open. What is important, however, is that it should meet the interests of the participants because otherwise no sense of independence or own initiative can develop.

b) Tackling the project initiative: The participants tackle the project initiative, using methods such as discussion, brainstorming or moderation techniques. The first ideas are jotted down in a project outline.

c) Developing the project initiative into an area of activity: The actual project develops from the initiative in this phase. Participants use their first ideas to develop a realistic plan. They draw up schedules, discuss conditions of realisation and divide the tasks among themselves. It soon becomes clear how educational the project is. The group discusses who does what, how and why.

d) Project execution: In practical terms, this is the core element of the project method. Now the project can be executed. A project plan is developed which specifies which participants should execute which tasks.

e) Project completion: There are various possibilities here. Usually a project or its results are presented. Another possibility is that the group goes back to the beginning and compares the results with the project initiative. The project then ends with some reflection. The goals aspired are to be evaluated and the specific procedures are explained, so that they are not simply discarded as unreflected experiences and quickly forgotten, thus not leading to long-term acquisition of knowledge. It is important to get to grips with the working and learning process, as well as the learners' interaction with themselves and the group.

During the course of a project, the groups meet the teacher regularly. Appointments are made during which the groups can talk about their progress and problems (fixed points). This is also the time when the further unfolding of the project is discussed.

Learning stations

Learning stations (also known as learning cycles) allow students to work freely and independently to process newly-learnt material. The main principle is that different students work independently and at the same time at different learning stations. These are set up at different tables in the classroom. Students find didactic material at each station that they can work upon without guidance from the teacher. They can work alone, with a partner or in a group of three or

four. Students work at their own speed, but the teacher decides how long this entire learning phase will last.

Illustration: Learning stations

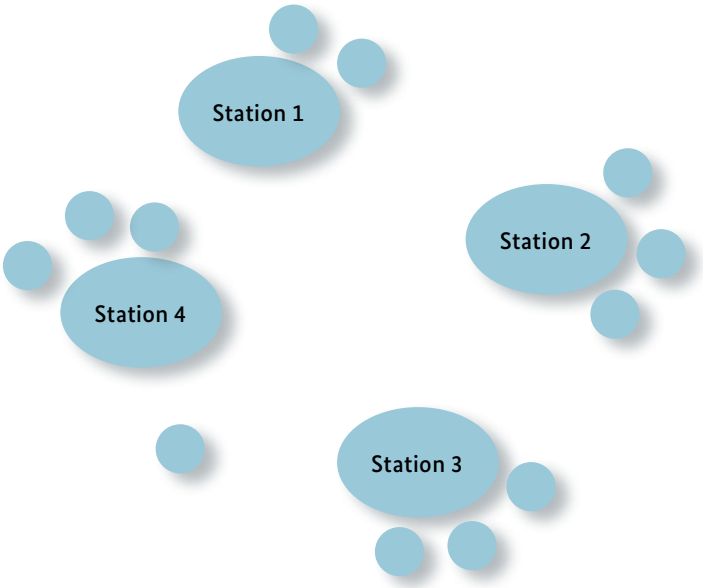


Fig. 51: Learning stations

To enable independent work, the students at each station can check their results: Either with the help of an answer sheet or the answer presents itself automatically for example when a puzzle is put together correctly. At the end of the lesson, the teacher gives an overall view of the results within the class. It is imperative that students present results to each other and make a joint evaluation.

Students work on tasks that are related to the subject, which generally build upon each other, to ensure that there are no gaps in the knowledge acquired. On top of the compulsory tasks, there can (and should) also be voluntary extra work to enable a differentiation between ability and inclination.

Version A:
At each station, there are tasks that can be chosen according to type, level of difficulty and form of work.

Version B:
For additional exercises, there are "voluntary stations" as well as the "compulsory stations".

Simulation games

These are reconstructions of real-life situations or possible anticipations of future real-life situations in which different groups defend their interests in a conflict that needs to be resolved.

The simulation game teaching method can illustrate models of economic or social situations. Learners function within this model for a given time period. They actively make decisions that have to be transformed into actions and that have an influence on the happenings within the model. The game is guided by the distribution of work-cards. Various influential factors are thus brought into the game that the various groups have to take into account. The simulation game has a structure that builds upon itself. The making of decisions results in goals being achieved over a number of rounds. Groups compete with each other and their goals and interests differ to a greater or lesser extent and they try to resolve problems respectively. When time is up, the game and its results are discussed by the groups.

Procedure/Execution

1. **Introduction of the game:** The teacher presents the simulation game to the class and explains how it is played, what it is about and what the opening situations is. Groups are then formed, the material is distributed and the first cards that are necessary for the game to begin are distributed.

2. **Information phase:** The groups look at the material. Comprehension questions that crop up are discussed in the group or with the teacher.

3. **Opinion and strategy planning:** The role-play situation is discussed by the group, the aims and interests are set, as well as the possible ways of achieving the goals. The most important findings and resolutions regarding the group

strategy are recorded in a summary report. The teacher acts as a background observer and adviser.

4. **Interactive phase:** The actual game begins. The groups enter the playing phase and start the communication by writing letters, requesting information, conducting negotiations or seeking allies. The teacher gives more motivation to play by distributing different work-cards.

5. **Meeting phase:** At the end of the game, the spokes-people for the various groups present all the arguments, questions and suggestions for resolving the problems to all the participants. There can be feedback or questions.

6. **Evaluating the game:** The final phase is for learners to give feedback about the game and discuss it. If there still are any gaps in knowledge or skills at the end, these can be addressed by additional material, discussions and exercises.

The simulation game can take up several hours in a series of lessons. It is the teacher's task to prepare and provide work-cards, material and exercises.

Role-play

Role-play describes a very specific type of simulation and is about interaction between people. The idea of using games to simulate the real world goes back to 3000 BC, to a game invented by the Chinese. Chess was probably one of the first war games.

Role-play helps to anticipate and practise social conventions and behaviour. Through such games, students can learn the norms that exist in society.

Role-play connects reality with playing. Real-life situations, problems or conflicts can be experienced through role-play and thus processed in advance.

Role-play is the spontaneous acting of roles to practise a behaviour that is called for in particular cultural situations. Students learn to deal with the different situations that they face in everyday life and act in a more confident manner through role-playing.

The simplest form of role-play is to ask someone to imagine themselves as somebody else and to behave how they think that person would.

Role-play can have different functions in class. Depending on the situation, the teacher's behaviour and the students, role-play can be used to introduce a subject, to address a problem, to warm up, as a break, or to summarise, recapitulate and sometimes even as a test.

Students are given the chance to practise interaction with others in particular roles. An evaluation at the end of the game is crucial.

Different types of role-play

Role-play can be characterised according to time, reality, personalities, size, length, the attribution of roles, information, means or intentions and goals. There is spontaneous role-play, structured role-play and class role-play.

There are very few instructions when role-play is spontaneous and players are given as much room for creativity as possible. Stimulus role-play belongs in this category (the stimulus is provided before the actual game begins), as does surprise role-play, where the stimulus is provided during the game so as to make it more exciting.

For structured role-play, it is very important to provide clear instructions regarding roles and situations, but also to leave enough room for creativity. To begin with, the situation is explained to the players so that everybody understands the social background. The roles are described within a social context and the interpretation of the roles can be worked on by the small group or predefined by "role-play cards". There is a difference here between partner role-play (e.g. man - woman, boss - employee) or group role-play.

Class role-play involves more participants and there is no audience. The person guiding the game starts playing immediately without there being a transition. The idea of the game is only roughly pre-structured. The participants improvise their roles themselves.

How role-play unfolds

Role-play cannot simply be introduced into class as a method without there being a preparatory phase - especially if hitherto instruction has been largely teacher-centred. Students need to be ready to accept their roles after carrying out certain exercises. The atmosphere has to be free of fear.

Role-play can be used in many ways but planning is very important and should be structured according to the following guidelines:

1. Setting the subject and deciding how it will fit into the teaching and learning programme
2. Defining external conditions
3. Listing critical aspects of the problem
4. Deciding what type of role-play and structure are needed
5. Choosing the role-play or creating material
6. Role-play procedure
7. Evaluation
8. Follow-up activities

Case studies

A case study looks at a real-life case from the world of business or from students' living environments. Learners are confronted with a real-life case that they discuss. They seek alternative solutions to a problem, choose one and justify why. Then they compare their results with what really happened. The aim of teaching with case studies is to present complicated but realistic material to give learners a chance to tackle real-life situations and thus improve their action-related competence and their decision-making and problem-solving skills. The students thus learn to analyse problems, collect information and evaluate it, analyse facts, develop alternative solutions and make decisions.

Procedure
While they work through the case, students go through a decision and problem-solving process that can be divided into six phases:

(1) Confrontation with the case: What happened?
The students are confronted with a situation that has something to do with their current or future professional situation and has a personal significance for them. It is important that they understand the problem because only then can a case study be worked on in a successful way. The material provides the starting point for researching a problem and carrying out a conflict analysis and the different interests in the case and how they can be brought into harmony is then discussed within the framework of an analysis of norms and goals.

(2) **Information** from the provided case material and from independent deductions: What information do we need? Where do we get it from?
The aim here is that students analyse the information that they have at their disposal and exploit is as much as possible to solve the case. It might be that they have to acquire further information by conducting ground research, asking students, studying written sources, conducting internet research etc.

(3) **Exploration** of alternative solutions: What solutions are imaginable?
This is about discussing possible solutions for the case. Learners should be encouraged to come up with different ideas for action and to develop and assess them.

(4) **Resolution**: Making group decisions: What are the consequences of the decision taken?
The advantages and disadvantages, as well as the consequences of the possible courses of action are weighed up against each other and evaluated. The aim is to take a decision and to justify it.

(5) **Disputation**: The different groups defend their decision. What speaks for and against the decision?
In this phase, the groups present their decision to the class and open it up to discussion. The aim is to allow groups to defend their decision against the class members' arguments and thus check whether their decision stands up to criticism.

(6) **Collation**: A comparison of the different groups' solutions with those that were taken in reality. What decision was taken in reality?
The students' solution is compared to the decisions which were made in real life. The students can see that there is not always agreement, as decisions are always made by humans, who are fallible.

Learning with work assignments

Work assignments help to create conditions for learning that is as effective as possible, in the workplace or with situations based on real-life business practice. They allow students to experiment. Working procedures can be illustrated, individual steps can be singled out and automated procedures can be made more transparent. The teacher acts as an adviser. To prepare students for how they should act later in a professional environment it makes sense to regard assignments as complete professional actions. A complete action includes researching, planning, deciding, executing, monitoring and evaluating. Different types of learning and work assignments can be used. Students can be encouraged to:

- carry out a clearly determined action
- to find a solution to a problem
- to answer questions from business practice
- to fulfil an assignment
- to make a decision
- ...

The starting point for setting work assignments is always real-life processes, e.g. a company's customer orders. The goal is to combine knowledge with its application. It is appropriate to use such tasks when learning is made difficult in the workplace. These difficulties could be lack of time for reflection and generalisation, unstructured working demands and processes, complex, opaque working procedures.

A learning and work assignment is a method that aims to combine work in a company and learning at school

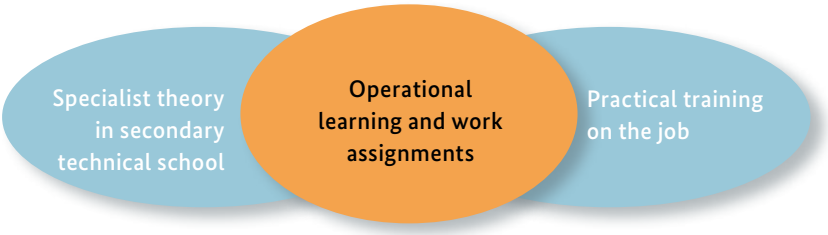


Fig. 52: Practical learning and work assignment

Features of learning and work assignments

- based on real-life work procedures in business
- professional tasks and actions should be shaped in such a way that students learn from them
- classical working methods, such as encouraging students to simply imitate an action that has been demonstrated, are less important
- learning materials that were previously used provide background information for students so that they can carry out learning and work assignments in an expedient manner; however, they are no longer an essential learning tools

Examples of learning and work assignments:

- Students conclude a real sales order alone or in a group
- Students conduct one step of a real sales order
- Students are involved with a development project in the company itself
- Students take on clearly defined management and organisational tasks within the company

Group puzzle / Jigsaw technique

For a group puzzle, you should work with a double group-structure: with core groups (family groups) and expert groups.

The core groups will all be presented with the same task. In order to work on this task, they will need additional knowledge. Each member of the core group is told that they are in charge of a specific area of knowledge. For these areas, groups of experts are formed and work on them together. These groups of

experts, therefore, are made up out of the members of the core groups who are in charge of the subject area. Once the experts have informed themselves about their areas of knowledge, they return to their core groups. There, everyone now works on solving the assignment. This construction shows that tasks can only be solved when each member of the group contributes their part.

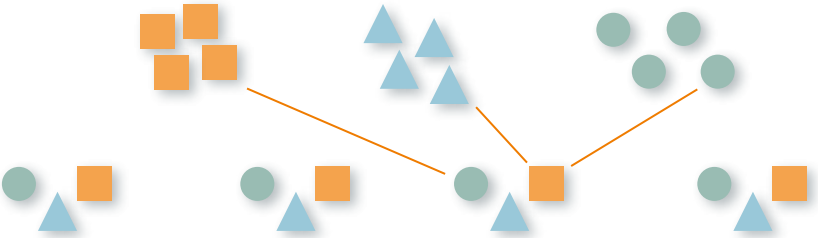


Fig. 53: Group puzzle

Preparation:
A larger topic is divided into equivalent parts, or puzzle pieces.

Phase 1:

The core group initially consists of students without special knowledge. But the aim is to train an expert for each part of the topic, or puzzle piece (or maybe more than one as backups).

Phase 2:

The core group disbands for the time being and the future „experts for....“ gather in groups. They are in fact turned into experts with the aid of materials, supervision by the teacher and monitoring of learning (The teacher should always resist the temptation to dominate the groups!) The “newly trained” experts will create a summary (a poster, a mind map etc.) in order to transmit their knowledge to the members of their core group.

Phase 3

Return to the core groups, which will at first be a mixture of experts. But: Each expert will now present his expert knowledge to the others, contributing his piece to the puzzle. When the puzzle has been completed, “everyone will know everything” and this will be proved in a monitoring exercise that the group has to solve together....

Future workshop

The method of „Future Workshop“ is based on the idea that people often possess untapped creative skills and potential for solving problems which can be activated. By using this method, these resources are mobilized with the aim of developing prospects for the future of individuals or the whole group and to plan concrete steps towards achieving these goals.

The Future Workshop is distinguished by the sequence of its phases. The **phase of criticism** begins after the introduction to the Future Workshop. In this phase, participants take stock of the present state of things. Their criticism, their unease, their problems – everything that the present is burdened with – is collected and presents a comprehensive illustration of the status quo. The next step is the Future Workshop's distinguishing feature: Instead of developing prospects for the future from a criticism of the present, the Future Workshop follows criticism with a **phase of visions**. Participants develop a notion of a future where all their wishes have come true; where they can live and work in a manner that seems ideal to them. This is based on the conviction that the goals of an organisation, a group or a team are most likely to be achieved if they are carried by the force of the employees' wishes and visions. Only then will they truly commit to achieving these goals. Once the visions have been developed, individually and in teams, the **phase of implementation** begins. In this phase, the visions' central elements are identified in order to deduce concrete working goals from them. The purpose of this phase is to connect the status quo with the desired status, the vision, and to develop concrete steps of action. The question is how to come closer to the vision, step by step. To answer this, plans for action with concrete steps of implementation are developed.

Self-organized learning /Self-regulated learning

The term „self-organized learning“ signifies a learning process that is regulated by students themselves. Learning becomes self-regulated or self-organized when students

1. are able to set their own goals,
2. have to motivate themselves,
3. select suitable learning strategies and tactics,
4. solve problems (e.g. learning obstacles and distractions) by themselves
5. and are able to present a learning result.

In real school life, point 1 can only seldom be realised, because content and goals are often determined by the syllabus. The approach of self-organised learning lets students practise step by step how to work independently and self-responsibly. It gives them the opportunity to shape the learning process partially or completely. If students are completely self-determined, they set their own learning goals and carry out learning activities to achieve them. They decide which activities they will carry out when, where and in what order.

E-learning and blended learning

Learning and teaching with the aid of computers and the internet have become daily practice in many schools today. With this comes the realization that the use of e-learning holds great potential for improving learning and teaching processes in schools.

Fig. 54:E-learning

- E-learning supports action- and competence-oriented teaching for new education standards.
- It is easier to deal with the increasing heterogeneity of school-classes with these individually adapted and differentiated options.
- E-learning is the ideal complement to the well-known school-book.
- E-learning helps students to acquire competences that they will need to achieve life-long learning.

E-learning can be seen as a learning process that provides new access to education with the aid of modern information and communication technologies. E-learning creates opportunities and forms of learning that are independent

of time and place. Furthermore, it demands and promotes self-organized and self-regulated learning.

For teaching in schools, the teaching/learning form of "blended learning" – an interaction of attendance teaching and e-learning via a learning platform – is the best way to go. The phases of distance in the learning process stimulate learning without the institution and outside the institution.

Online learning platforms can be used as tools to regulate learning processes. Forums, blogs and wikis serve as communication and information portals. Systems for the management of learning work as incentive and promote motivation for self-reliance.

Scenarios of teaching and learning which make good use of the potentials of learning platforms can bolster the development of self-competence. Skills and competences learned in school will be vital for all further training activities in an active professional life full of personal growth.

Part 4 Exemplary Lesson Plan

Lesson in retailing: "Dealing with particular sales situations: Customer behaviour and types of consumers"

This lesson is taught to students who are being trained as retail salespersons. The lesson will be 45 minutes long. On the following pages, you will find these materials:

1. Schedule
2. Role play games: You will find the role cards which will be given to the students who are playing the various roles (salesperson – customer).
3. Observation exercises (2 different assignments) for the students who will be watching the role play.
4. A worksheet that will be filled in class and will serve to secure the results.
5. The solution to the worksheet.
6. The teacher's instructions on how to observe the role play games.

Dealing with particular sales situations:
Customer behaviour and types of consumers (45 minutes)

Learning goals	Methods/ Studentgrouping	Media and resources	Course of the lesson
LG 1:	Motivation, role play	Role instructions for role play 1 + 2; 3 pens	• Students present a role play game in pairs • The rest of the class observes and pays special attention to the customer's behaviour → Can this kind of customer-behaviour be observed in working practice? → Classify „typical" behaviour: types of consumers
LG 1, 2 u. 3:	Group puzzle	WS group A WS group B worksheet	Introduction to the „partner puzzle"-method: • Students form pairs of experts with their neighbours • Mutual explanation in the partner puzzle → The results are noted down on the worksheet [Suggestion: using paper of various colours makes it easier to form puzzle pairs]
LG 4:	Role play Teacher-student-discussion	Role instructions for role play 3 + 4; Observation assignment	Reference to the original situation: • What type of consumer was portrayed in scene 1 or 2? • How should a salesperson deal with customers like this? Present two more role play scenes, followed by a discussion of the presented types of consumer and the sales person's behaviour.

Partner puzzle: Types of consumers

Group A: Talkative, knowledgeable and cost-conscious customer

1. Assignment for pair of experts:

⏳ 15 minutes

Before you answer the following questions, please read the information texts:

The talkative customer

Characteristics: He has a great need to talk and tries to start a conversation with the salesperson. He will talk about personal matters, such as his holiday destinations, family stories etc. as well as current events.

Behaviour of the salesperson: The salesperson should listen carefully and show an interest, but he should not ask any questions, to avoid making the customer talk even more. The salesperson should try to steer the conversation towards the sale.

The knowledgeable customer

Characteristics: He will state a clear wish and use specialist terminology. He will examine the goods carefully and assess them appropriately.

Behaviour of the salesperson: In conversation with an expert, the salesperson should use specialist terminology and let the goods speak for themselves as much as possible. The salesperson does not need to give special information, since the customer seems to be well informed.

The cost-conscious customer

Characteristics: This customer is focused on the price. He is highly interested in the price and will examine the least expensive option carefully. He would like the quality of the least expensive option to be as high as that of the more expensive one. He often believes that goods are too expensive and will try to strike a bargain.

Behaviour of the salesperson: Salespersons should show this customer the less expensive goods. He will be especially interested in reduced individual items or goods from special sales.

1. Customers display typical behaviour patterns. Groups of customers that display typical behaviours are called types of consumer. How can we recognize types of consumers? How should you as a salesperson treat these types of consumers?

Note down your results on your worksheet (in keywords)

2. Discuss with your expert partner: Which of these types of consumers frequent your workplace? How do you deal with them?

2. Assignment for the puzzle pair: ⏳ 12 minutes

Tell your puzzle partner which types of consumers you observed. With the help of your worksheet, explain which characteristics you recognized and how you as a salesperson should deal with the costumer.

Note down your results on your worksheet (in keywords).

Partner puzzle: Types of consumers

Group B: Indecisive, distrustful and arrogant customer

1. Assignment for pair of experts:

15 minutes

Before you answer the following questions, please read the information texts:

The indecisive customer

Characteristics: The appearance of this customer shows indecisiveness and insecurity. He looks around doubtfully and often expresses his wishes without conviction.

Behaviour of the salesperson: The salesperson should give this customer plenty of time to consider and be very patient. The salesperson should not present too many goods, but he should support the decision of the customer by giving him recommendations.

The distrustful customer

Characteristics: This customer often has a distrustful facial expression. In conversation with the salesperson, he will express his doubts about the goods. He will choose slowly and cautiously.

Behaviour of the salesperson: The salesperson has to take the customer's doubts seriously. The salesperson will have to possess an extensive knowledge of his goods and be very patient.

The arrogant customer

Characteristics: This customer likes to be the centre of attention. He will not tolerate contradictions. He is always right. He is often impolite, sometimes even insulting towards the sales staff.

Behaviour of the salesperson: Dealing with this customer is tricky. The salesperson will have to be very patient and self-controlled, since he has to meet this customer's egotism with apparent approval. It is vital that this customer too is treated with politeness.

1. Customers display typical behaviour patterns. Groups of customers that display typical behaviours are called types of consumer. How can we recognize types of consumers? How should you as a salesperson treat these types of consumers?

Note down your results on your worksheet (in keywords)

2. Discuss with your expert partner: Which of these types of consumers frequent your workplace? How do you deal with them?

2. Assignment for the puzzle pair: ⏳ 12 minutes

Tell your puzzle partner which types of consumers you observed. With the help of your worksheet, explain which characteristics you recognized and how you as a salesperson should deal with the consumer.

Note down your results on your worksheet (in keywords).

Types of consumers

Types of consumers are groups of customers that show similar behaviour when they are shopping or during the sales conversation.

Type of consumer	Talkative customer	Knowledgeable customer	Cost-conscious customer
Characteristics			
How should the salesperson behave?			

Type of consumer	Indecisive customer	Distrustful customer	Arrogant customer
Characteristics			
How should the salesperson behave?			

Possible solution:

Type of consumer	Talkative customer	Knowledgeable customer	Cost-conscious customer
Characteristics	Great need to talk; talks about personal matters (family, holidays…)	Clear wishes; expert statements; uses special-ist terminology; examination and assessment of goods	Interested in price and quality of the least expensive option
How should the salesperson behave?	Show interest, listen attentively; try to steer the conversation towards the goods	Use specialist terminology; let the goods speak for themselves	Present price-reduced goods, e.g. remainders or individual pieces

Type of consumer	Indecisive customer	Distrustful customer	Arrogant customer
Characteristics	Looks around doubtfully, doesn't know what he wants, speaks full of doubt	Distrustful facial expression, doubts about the goods, slow decisions	Likes to be the centre of attention; impolite behaviour
How should the salesperson behave?	Give time to decide; present only a small selection of goods; assist by presenting a small selection; suggestions for choice	Take the criticism seriously; extensive knowledge of goods necessary to convince	Accommodate with appreciation, self-restraint and politeness

Role play 2

Indecisive customer

Role instruction for scene 3: Customer

Situation: A customer comes into a shop (the classroom represents the sales floor)

Role instruction: You enter the shop to buy a new mobile phone for yourself, because your old one isn't working anymore. You are indecisive and unsure of which mobile phone you would like to buy.

Role instruction for scene 3: Salesperson

Situation: A customer comes into a shop (the classroom represents the sales floor)

Role instruction: Welcome the client and conduct a sales conversation.

Distrustful client

instruction for scene 4: Customer

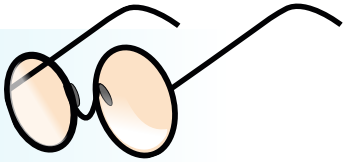
Situation: A customer comes into a shop (the classroom represents the sales floor)

Role instruction: You enter the shop to buy a mobile phone for yourself. You would like to buy a smart phone because you travel a lot for your work and would like to have the option of surfing the internet and checking your business e-mail. You would also like to use the phone as a navigation device and for taking photos.
You ask the salesperson to show you several phones and you inquire about details. As a principle, you don't trust salespeople. You are afraid that they could withhold important information and that the salesperson in this case could be trying to foist a phone on you. You keep checking and are not easily convinced.

Role instruction for scene 4: Salesperson

Situation: A customer comes into a shop (the classroom represents the sales floor)

Role instruction: Welcome the client and conduct a sales conversation.



Observation assignment

- Observe the sales conversation attentively
- Pay special attention to the behaviour of the salesperson with respect to the consumer type represented by this customer
- Note down your results in keywords

Part 5 Glossary

Didactics

Didactics is the science of teaching. Didactics deals with teaching by teachers and learning by students as well as the organisational setting. It covers all forms of learning and all kinds of teaching, regardless of the content taught. Didactics is the science of teaching with regards to educational mandates, the intended learning goals as well as methods and media. Essential elements are the "WHAT", meaning what is learned and the "HOW", meaning how the content is transmitted. Didactics deals with the formulation of learning goals, the selection of teaching content and suitable teaching methods.

Didactic models

Didactic models try to illustrate the complex reality of teaching, including essential factors of influence. Didactic models sum up all necessary considerations regarding the planning and analysis of teaching, such as goals and contents, methods, media and resources, requirements and general conditions.

Action-orientation in teaching

Action-oriented teaching is a method that ensures student-activity and aims at letting students learn independently, solve complex tasks and achieve a result by themselves. The aim of action-oriented teaching is an active student. Action-oriented teaching generally starts with a concrete practise situation (Step 1) and proceeds to (Step 2) deduce a general rule from this, or to illustrate a general principle (inductive procedure). Action-oriented teaching motivates students to learn with "head, heart and hand". Students often create products of an action in action-oriented teaching. These could be results of exercises, learning posters, summaries or presentations, but sometimes they are "real" products, such as a work-piece.

Instruction

Instruction is the opposing concept to action-oriented teaching. In instruction, the principle is explained first, together with the rules or contexts. This is followed by work on exercises and examples to illustrate the principle.

Competence

The term "competence" describes the general ability to act independently in new or open situations. At its core is people's ability to solve certain tasks or deal with certain situations (professional, social, private): e.g. to conduct a sales conversation, take part in a discussion, repair a defective control system at home or in a factory etc. People are able to manage various different situations in their lives if they possess knowledge, skills, experience and the ability to adapt their behaviour. We say that people are competent when exercises, assignments and situations can be solved in a way that is considered appropriate in real life. Educational theory distinguishes between various kinds of competence: Specialist competence (specialist knowledge, knowing "what"), method-related competence (procedural knowledge, knowing "how"), social competence (the ability to communicate and interact with others) as well as personal competence (the ability to behave appropriately, to be punctual, to follow rules, to work well etc.).

Learning goals

Learning goals define what students should be able to accomplish at the end of a specific learning unit. Learning goals usually refer to individual lessons or teaching units. They describe the performance which students should have achieved at the end of the unit in relatively minute detail. Learning goals should be operational to make them more easily observed and monitored, e.g. "The students should name three options and explain them in their own words."

Methods/Teaching methods

Teaching methods serve to transmit content and material defined in the syllabus. They deal with "how" these contents are to be brought closer to the students. There are methods which are applied chiefly by the teacher (teacher-centred methods), such as the lecture, for example. And there are methods which rely on students taking an active part (student-centred methods), for instance in role play performed by the students. Different learning goals and different phases of the lesson require different methods. The methods should be chosen to match the learning goal/s, i.e. a method is appropriate if it serves to achieve the learning goal/s.

Depending on how much time the methods require, we speak about small-scale or large-scale methods.

Examples of teaching methods:

- Lecture
- Demonstration
- Asking-developing method
- Discussion
- Role play
- Learning circle
- Group puzzle
- Case study
- Experiment

(further examples: verbal dispute, podium discussion, text work, work with flash cards, creating a collage/wall newspaper, exploratory walk, interview, work with fixed images, storytelling, learning games etc.)

Large-scale teaching methods

- Simulation game
- Project
- Training programme
- Internship
- Excursion etc.

Phases of lessons

Lessons are always made up of different phases. The teacher has to find a way to start the lesson and this will be followed by phases of elaboration and securing of results, for example.

- Warming-up
- Elaboration/Work phase
- Evaluation phase
- Securing results
- Repetition phase

(further examples: appropriation phase, publication phase, preparation, introduction, preamble, practice, consolidation, problem-solving, monitoring, application, transfer, summarization, problem-formulation etc.)

Teaching procedures

Teaching can be planned in several ways; there are various different procedures. For instance, students can be introduced to new information using concrete examples, followed by information about the fundamental rules or regularities (= inductive procedure). The opposite procedure is also possible: rules, regulations etc. are presented at first and then concrete examples are developed with the students (=deductive procedure). There are several teaching procedures; here are some of the most important ones:

- Inductive procedure
- Deductive procedure
- Genetic procedure (in this method, the development and history of the subject are presented, e.g. the history of money)
- Systemising procedure (a systematic introduction to the new area of knowledge)
- Analytic procedure (an analysis of the subject's various elements)

Student grouping

The student grouping describes the way a lesson is organised, i.e. how the seating is arranged and how students work together. There are four kinds of student grouping:

- Direct teaching (also known as: class teaching or plenum)
- Group teaching/ group work
- Partner work
- Individual work

Master copies

Template for a schedule:

Week	Date	Contents Targeted	Achieved
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Example of a class observation form:

Type of school/ Class:	Topic of the lesson:	
Date:	Time:	
Parameters for observation with examples of indicators that should guide the observation	Observations of behaviour of teachers and students in chronological sequence	Subjective interpretations, own ideas (if possible, only fill in after the observation)
Standard 4: **Professionalism in guiding the class:** Indicators for observation: _____ _____ _____ _____		
Standard 5: **Student-orientation and interaction** Indicators for observation: _____ _____ _____ _____		
Other observations beyond the agreed parameters, but that are important to me nonetheless		

Table of Figures

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