Selecting and Structuring

Vocational Training Contents

Impressum

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InWEnt

InWEnt – Capacity Building International stands for human resource and organizational development within the framework of international cooperation. InWEnt's services cater to new managers, skilled and executive personnel as well as to decision makers from businesses, politics, administrations and civil societies worldwide.

Programs and measures at InWEnt aim to foster the capacity for change on three levels: They strengthen the capacity of individuals to act, increase the performance of businesses, organizations and administrations, and improve the capacity for action and decision-making at the political level. InWEnt's methodological tools are drawn up in modular form, so that they can be used for customized services development, according to needs and demand. In addition to face-to-face training situations, to exchange and policy dialogue, emphasis is also given to networking with the help of e-learning. InWEnt's partners are equally from developing, transition and industrialized countries.

InWEnt shareholders are the German Federal Government, represented by the Federal Ministry for Economic Cooperation and Development, as well as the German industry and the German federal states (Länder).

InWEnt was established in 2002 through the merger of Carl Duisberg Gesellschaft (CDG) and the German Foundation for International Development (DSE).

Division 4.01 of InWEnt has its seat in Mannheim and conducts on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ) advanced training programs. Under the banner of "sustainable development", its work focuses on questions of technology cooperation, system development and management in the field of technical and vocational education and training. Its dialog and training programs are targeted at decision-makers from the public and private sectors, junior managers and multipliers from vocational training systems.

Introduction

From 2003 onwards, InWEnt´s Division "Technological Cooperation, System Development and Management in Vocational Training" is to present a series on everyday practice in vocational training.

The intention of this series is described in the title itself ("Beiträge aus der Praxis der beruflichen Bildung" = series on everyday practice in vocational training). The division aims to support its programs of international personnel development in the above-mentioned areas with technical documentation in both printed and electronic form.

These reports

> originate in the partner countries, taking into account specific situational demand

> will be tested with and for experts in vocational training in the partner countries in conjunction with respective practice-oriented training programs on offer, and

> with a view to global learning, will be improved and adapted prior to publication according to the recommendations of the partners or the results of the pilot events.

Thus, the Division "Technological Cooperation, System Development and Management in Vocational Training" is applying the requirements of InWEnt´s training program to its own products in the above faculties: i.e. these can only be as good as their practical relevance for the experts of vocational training systems in the partner countries.
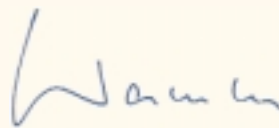
To this effect, we look forward to critical and constructive feedback from all readers and users of these special series.

This manual is one of an entire series of InWEnt publications that have been produced as a result of training seminars and courses carried out in cooperation with the vocational training institute SENATI in Peru.

Our special thanks go to Prof. Tippelt of Munich University and Mr. Amorós from the "International Cooperation Office", who both made invaluable contributions to these activities.

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The Three Phase Procedure

Selecting and Structuring the Curriculum

In many countries nowadays, vocational training schemes are under great pressure to succeed: course participants expect guaranteed access to the labor market and career success; companies expect skilled, flexible and efficient employees; society expects greater potential for competitiveness, employment and prosperity; and politicians expect support in dealing with economic and social crisis situations. Vocational training should be dependable and extensive, flexible and dynamic, geared towards the job market and towards fostering personal skills; all of this together and for the rest of a participant's life.

Faced with such great and sometimes contrary expectations, those responsible for vocational training are well advised to form their own vocational training vision capable of incorporating all of these different demands but without exhausting itself by doing so.

In light of such a vision, successful vocational training for qualified skilled laborers could be measured according to the following characteristics:

> **Finished Students' Action Competence:** The object of vocational training is to acquire action competence. Unlike academic or general educational institutions, the object of vocational training institutions only partially has to do with developing systematic technical knowledge. The aim of vocational training is to earn qualifications to be able to fulfil tasks in a skilled manner and at a qualified technical level.

> **Transparency and Acceptance of Certificates:** Avoid splitting the curriculum excessively so that transparency is as great as possible and diplomas are widely accepted in the occupational and labor markets. The basis of this must be a coherent competence profile accepted in the labor market with generally approved certificates.
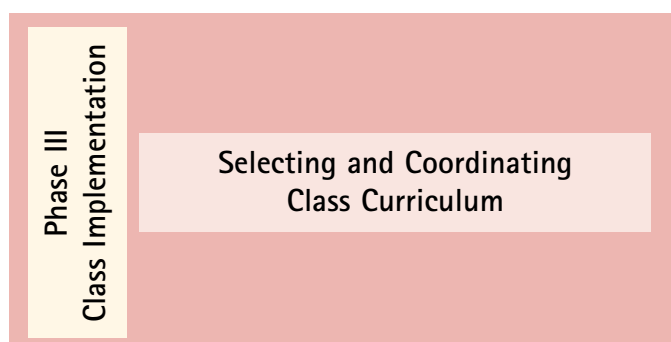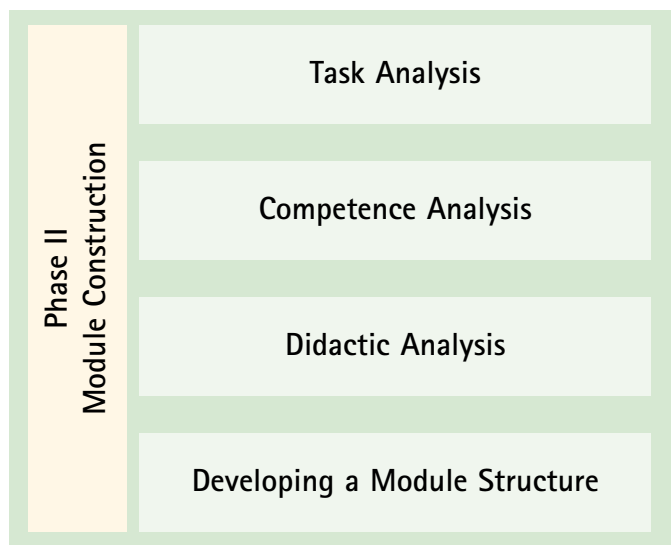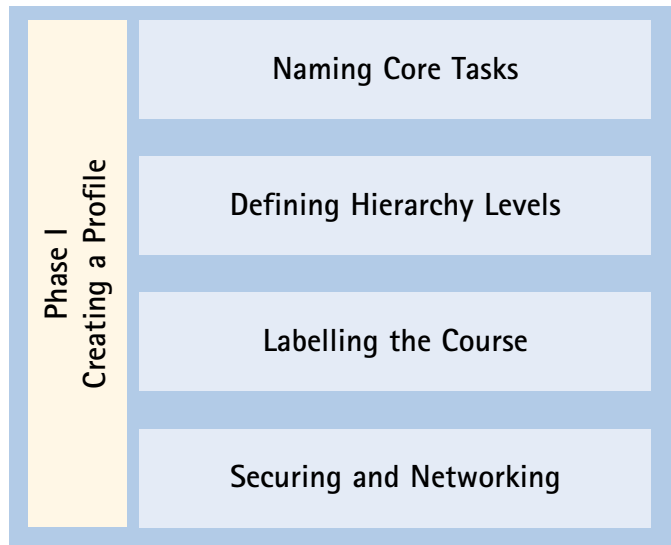
> **Reliability of Further Curriculum Levels:** The selected profile has to be stable enough over a longer period of time to offer a consistent basis for labor market decisions and a reliable starting point for further qualification strategies. Above all, the higher, more general curricular levels remain valid in the long term.

> **Flexibility of Lower Curriculum Levels:** In terms of content, vocational training adapts to changes in technology and society with no trouble. Today, quality of training also means being aware of current developments, and training for the future. While the general profile of the training should accommodate for the long term to form and claim market value, the curriculum is easily adaptable and flexible to account for new circumstances.

> **Harmonious Integration:** The training concept is harmoniously integrated into the (work) cultural and social conditions of an economic zone or of a country.

> **Profitability:** Since the method must remain highly sustainable, vocational training is so uncomplicated and affordable that it should not fail due to organizational or financial problems.

On a structural level, vocational training therefore requires stable, lasting effective skill profiles geared towards the requirements of the labor world, which are also recognized and accepted by society and in the labor market. At the same time, the content of the curriculum also requires a certain amount of flexibility and adaptability to the changing conditions of dynamic labor markets. Our concept of selecting and structuring the curriculum for vocational training sets itself the goal of combining both criteria (reliability of profiles with the flexibility of contents). We propose a three phase procedure:

1. Narrowing down and describing a general competence profile. This includes classifying the vocational goals by typical labor categories or ones which have to be classified from scratch, explicitly naming the vocational certificate, and roughly defining the most important areas of activity.

2. The second phase defines the content of the individual modules.

3. Finally, a curricular concept can only be successful once it has been converted into and implemented in teaching/learning situations.

Between phases one and three, the period of validity for decisions decreases: while the competence profiles are valid for a relatively long phase, the modules continuously adapt to new technical, organizational and economic ancillary conditions. Teaching/learning situations develop in the interaction with groups of students and are therefore particularly dependent on current circumstances.

The Three Phase Procedure

**Phase I
Creating a Profile**

> Naming Core Tasks

> Defining Hierarchy Levels

> Labelling the Course

> Securing and Networking

**Phase II
Module Construction**

> Task Analysis

> Competence Analysis

> Didactic Analysis

> Developing a Module Structure

**Phase III
Class Implementation**

> Selecting and Coordinating
> Class Curriculum

Phase I – Creating a Profile

Among other things, a vocational training certificate is also a product which needs to be marketed both on the vocational training market and in the labor market. Young people and their parents are supposed to demand vocational training, participate in it in a motivated manner and should occasionally be prepared to pay vocational training fees. Companies, on the other hand, should employ graduates, pay them as much salary as possible and should give them enough options. As well as the vocational training institutes, the general education system should also recognize and integrate the certificate in the existing education system so that the course does not become a "dead end", but instead relates both to industry-wide and in-company career options.

To reach this goal, the following three conditions are required – on top of the quality of the training, which is only visible in the long term:

1. **Needs and programs must correspond to each other.** The question here is: Who needs the planned training? In your answer, issues of society's demand for vocational training play an equally important role as the expected economic and technological development and legal, organizational and social contexts. In detail, to want to survey and forecast all of these factors with a certain degree of precision is (in contrast to the 1970's) today considered hardly realistic and one which is hardly worth financing. In general, however, the actors involved in a vocational training project have relatively clear, informed assessments of the current situation.

2. For all involved as much **transparency** as possible in the desired qualification profile. A clearly defined idea of the future area of operations and the skills connected with it lets the students develop a secure, vocational identity. Potential hiring companies receive some form of security as far as the workers' skills, services and costs are concerned. With the aim of entering further training courses, a solid qualification profile can inform the proper institutions of the knowledge level of the graduates.

3. As much **reliability** of the profile as possible. People who need training are just as dependent as educational providers on the fact that training programs provide a reliable planning basis. Such a form of stability can benefit from the recognition earned and agreements made with the proper authorities, associations and institutions.

For instance, vocational training programs are developed by educational providers, schools or planning offices. The teams assigned to develop the curriculum and draft the program are often experts with a lot of experience and intuition.
Confronted with the new demands of labor market-oriented, demand-related and modular training programs, current curricula can no longer be continued nowadays, and new more systematic methods of developing curricula have become necessary. This brochure is intended as an aid. It is for teams or project groups which have to develop new forms of demand-oriented and modular training programs. It offers a step-by-step procedure, from forming a profile for the new training program to its implementation.

The Task

The first step is to create a profile. To begin with, three fundamental decisions need to be made:

1. Which **core task** should be characteristic for graduates' work?

2. Where should the training be located in the educational system and the labor market **hierarchy**?

3. What is the desired certificate **called**?

At the beginning of the procedure, the project group needs as much information as possible on the vocational field's situation. This might include data on the labor market, information on technical revisions, upcoming structural changes, cyclical developments or information on operational qualification needs. The training and further training situation in each sector should also be documented as much as possible. Information on the target group's (e.g. graduates of certain types of school) demand for vocational training is also indispensable for planning cost-efficient training programs.

Anchoring the planned training program with actors and associations both in business and society helps the certificate's future acceptance. Bringing in deci-

sion makers from state, corporate or private institutions into the profile forming process is an effective method. The future success of the training program depends on the training profile's formal and informal recognition. Intensive participation in the fundamental basic decisions can motivate your negotiation partners to give further support. This phase must also ascertain the conditions and opportunities for formalised recognitions, financial support and organizational cooperation.

Creating a Profile: Involved and Responsible Groups

Authorities Responsible
e. g. Labor Ministry
e. g. Ministry of Education

Affected Social Groups
e.g. Educational Providers
e. g. Parent's Organizations
e. g. NGO's
e. g. District Groups
e. g. Church Organizations

Project Group

Associations
e. g. Industrial Associations
e. g. Employer's Associations
e. g. Trade Associations
e. g. Trade Unions

Expert Groups
"Workplace Experts"
"Training Experts"

Steps and Core Issues & Questions

First Step: Collect and Assess Core Tasks

The content of a training profile is determined on the basis of a few (between one and three) core tasks which the fully trained specialist should be able to fulfil. These core tasks do not cover the entire spectrum of functions of a particular training profile. When defining core tasks, the idea is to filter out the tasks without which the actual character of the training profile would be lost. The core issue when selecting core tasks is therefore: Which central task is particularly characteristic for our qualification profile?

Even if the answers to such a question may seem trivial (producing bakery products, maintaining cars, looking after mental patients), for future specialists these will be the focal point of their vocational identity. A clearly defined task lets them see themselves as skilled in fixed field, define responsibilities and distinguish themselves from other task areas.

The discussion is based on information on the qualification supply and qualification demand in a region or economy both on the macro-level and in the sector. Appropriate basic data or pilot studies should be ready in advance and all involved should be familiar with the information.

An open discussion atmosphere, which initially accepts all ideas regardless of whether they can be realized or not, is a prerequisite for these (and following) steps. The assessment phase critically evaluates and comes to a collective judgement on the ideas collected openly. The discussion rounds may be moderated events (for instance as a meta-plan panel). Other forms of discussion are equally feasible, yet might not be suitable for the complexity of the approach.

Core Issues & Questions:

Collection phase: Which core task is particularly characteristic for the work of the graduates of our training courses?

Assessment phase: Which of the mentioned tasks are indispensable for a coherent training profile, which are expendable? Which tasks can be omitted without fundamentally altering the nature of the job function?

Without distorting their meaning, are there advanced concepts and summaries for the remaining tasks?

Which tasks prove to be preliminary, subsidiary or downstream to other functions?

Second Step: Defining Hierarchy Levels

By positioning the training certificate somewhere in the education and labor market system, the new training program can be integrated in the existing, culturally and economically evolved system. Both formal recognition by the proper educational institutions and authorities which let graduates enter the education and further training system, and acceptance of the certificates in the labor market are dependent on the planners keeping to culturally established, common certificates.

The type of level of qualification which should be reached is also dependent on the type of target groups the training program should target. Carefully analyzing expectations, resources and motives in this group helps to steer clear of unrealistic objectives.

When establishing hierarchy levels, the project group initially develops unscreened ideas about (a) on which level of operative organization the trained specialist should become active, and (b) at how high

the formal certificate should be positioned in the education and training system. Only in the next step the project group does ensure the necessary support of the proper boards and institutions. The first step, however, must answer the following core issues & questions:

Core Issues & Questions:

At which of the common operational levels should specialists we have trained be able to function?

Which formal steps are necessary to reach this hierarchy level?

Which type of training do specialists from our sector normally have at this level of hierarchy?

To what extent is the existing form of training in need of reform?

What is the likely demand for specialists we have trained?

In case answers to these questions require further information, it is important to obtain the proper information right away. At the same time, adhere to the principle of making economic rational decisions. When collecting information, a pragmatic approach (asking selected experts, using existing data, etc.) might make more sense than detailed, empirically tested surveys.

Ideas for future placement of graduates of the planned course can also lead to links to later types of cooperation with other groups either directly or indirectly involved in the training program. During the discussion, keep in mind which other actors (institutions, associations, authorities, companies, etc.) might be available for creating networks again.

If the planned training course is not to be a "dead end" in the country's education and training system, the issue of establishing links to existing education and training programs must also be cleared besides the issue of classification in line with operational work organization categories.

Core Issues & Questions:

Which is the most equivalent formal training or educational certificate to our training program?

What are the differences between our planned training program and other common forms of training?

If in our opinion we have the most reasonable formal educational degree to give – are there competitive situations disadvantageous to our training program which might result from this? (For example, are we providing a certificate available elsewhere at less overall effort?)

Which further educational opportunities do our planned training program graduates have once they have passed the degree?

Which of these options might the trainees want to aim for? Is there a possibility of undesirable consequences for our training program (e.g. if the majority of graduates chooses to go on to further educational institutions and is not available for the labor market)?

Even after answering these questions, include an intermediate stage and clarify where there were information deficits in the discussion or how these can be avoided. At this stage, also direct attention to possible cooperation partners.

Third Step: Labelling the Course

The description of a training certificate should include information about the decisions made so far: it should state the training program's job field (baker, carpenter, auto mechanic), and it should state the level of training in the country's common labor market structure (master of..., diploma in....).

To ensure long-term acceptance of the training diploma it is important to select a definition which is as clear and concise as possible and which avoids both confusion with similar certificates and all too rare levels of specialization.

Core Issues & Questions:

Is there a common description for the job, the function, the training certificate we are planning?

Does this description convey the core of what the planned training program is about?

Does it link to other possible existing classifications in the education, training and employment systems?

Is it clear and unmistakable, i.e. does it avoid unwanted confusion with related functions?

Is it appealing, i.e. does it have positive, forward-looking associations?

What is the common job description for the operational and formal level of hierarchy which should be reached with the training program?

Is the job description clear?

Fourth Step: Securing and Networking

In this step, the project group introduces the ideas developed to a broader basis by entering an extensive dialogue with institutions, experts, associations, authorities and private persons directly or indirectly involved. This step's purpose is to make sure that the planning is on a sure foot and to network it with other social groups and institutions.

Exploratory discussions or talks, workshops or exemplary surveys all help to clear to what extent the profile's design corresponds to actual demands both on the part of potential trainee students and on the part of the labor market and to find out how widely accepted it is. Especially in the area of vocational training one cannot afford not to involve a wide range of training or labor research institutions.

Conclusions

The findings in Phase I Creating a Profile are as follows:

> the **name** of the planned training certificate. This name reveals as much about the graduates' future functions as it does about the required level of hierarchy vis-à-vis both the level of education attained as well as the position sought in the company.

> a central **core task** of the trained specialists

> **contacts** to groups of people involved or interested in vocational training who have been informed about the planned training project, and in the best case could be included in the training project design.

Phase II – Module Construction

Training courses have many different structures. They can be short-term courses or longer term courses, small-step units or comprehensive job training schemes. We recommend a modular training structure. Modularisation means determining building blocks within a full-time course where each block can be passed individually. Modules can help keep the training course flexible both in terms of time and organization, by letting the trainee students choose when and in what order they wish to take course modules. Interruptions no longer necessarily mean an end to the course; in principle, certificates for partial qualifications are also feasible. Knowledge and skills attained informally (e.g. at the workplace) can also be formally recognized and supplemented with theory-based modules. Individual modules, which may be obsolete or considered incompatible, are easy to modify, complement or remove without having to question the entire concept as such.

Yet in our opinion, certificates from individual training modules should not become relevant for the labor market. Certificates graduates use to submit to their application in the labor market should rather represent comprehensive training courses with a broad occupational basis. The only modules worth considering as independent blocks are specialization modules as part of further training.

In this manner, the advantages of a flexible time and learning approach should be preserved without doing any damage to the whole context of the training course and to its market value (cf. also Kloas 1997).

The Task

The next step is to design training modules for the various job fields. Modules are training units which impart basic concepts or are used to train certain, characteristic work functions. To be able to describe the individual modules, required specifications include the approximate duration of a class, the definition of the syllabus and an explanation of the exam topics. With modules, students can normally sit the module exams without compulsory attendance of training class (external).

In contrast to the higher training profile, modules are fairly flexible and adaptable to regional or current needs.

Use a three-step approach to specify the module structure:
> **Task analyzis** to find out which individual processes and functions belong to the job's areas of responsibility.
> **Competence analyzis** to determine which qualifications and competences are necessary for secure and efficient realization.
> **Didactic analyzis** works out the right syllabus to fulfil these requirements.

What is characteristic about our concept is we attach particular weight to the didactic analyzis step, i.e. to developing the syllabus. This step does not simply equate the syllabus with the functional requirements (for example to the effect that "trainees should learn to give clients competent advice"). Instead, it needs an individual analyzis of the knowledge and attitude components and ideas of how this knowledge can be constructed systematically. This independent, educationally substantiated form of systematic syllabus no longer based on a previously developed system of actions, but instead on a clearly delineated learning system, distinguishes systematic learning from everyday-related, informal types of learning.

Involved and Responsible Actors

In the fifth and sixth step of the approach, task and competence analyzes, the basic rule (known from the DACUM = Develop A Curriculum method) applies that people who work in a particular field are the people who have the most expert knowledge

of that line of work, i.e. consult with people who work in jobs which correspond most to the previously defined profile.

Didactic analyzis (seventh step) invites groups of people to the discussion who are active in training and who can add knowledge in terms of systematic knowledge acquisition, probable target group conditions, and tried and tested teaching methods.

Both groups of people should be represented in the project group so that the module development phase is in the responsible hands of this group.
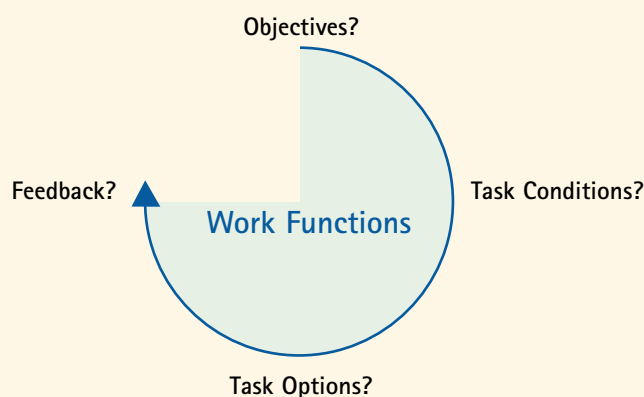
Steps and Core Issues & Questions

Fifth Step: Task Analyzis

When analyzing tasks, allocate work functions to the areas of responsibility identified in the framework structure. Areas of responsibility are fairly abstract and concise descriptions of sets of tasks or instructions (e.g. accounting, maintaining farming machinery, etc.). Work functions, on the other hand, are specific, purposely planned, work tasks repeated in the everyday working environment (e.g. drawing up a balance sheet or fixing brakes).

Similar to areas of responsibility, work functions can normally be viewed as a pair of definitions consisting of the topic of work, or a client, together with a verb (installing an oven, programming computer software, etc.). When depicting work functions, they should be illustrated as complete actions. The distinguishing feature of a complete action is that the person performing the action is independently pursuing an objective, looking for a solution and controlling the success of her or his actions. They weigh up the conditions and possibilities and choose – more or less consciously – certain methods of execution. They compare the result with the original objective. In a positive case the person completes the action or, in the case of an unsatisfactory result, either modifies the objective or initiates a new execution loop.

Work Functions

Objectives?

Feedback?

Task Conditions?

Work Functions

Task Options?

To systematically list all of the work functions which belong in a certain area of responsibility, the project group first openly collects and sorts ideas in an associative manner. It then goes into more detailed questions. The core issues & questions in this phase are:

Core Issues & Questions:

Which work functions belong to the trainee student's future tasks?

Which products or services are manufactured or provided in the job? Which various actions do the trained specialists perform in a line of work or for a client?

Which actions are necessary to coordinate one's own work with the company's work processes?

Which actions are necessary to ensure a supply of means of production or tools?

Which actions are important for coordination with other team members or co-workers?

Which actions are of significance for develop-ing and improving work processes?

Which actions are necessary for developing own qualifications?

The collection of possible work functions is then ordered and summarized. This step is of particular significance for the transparency and structure of the further work. The extended project group then has to ask itself:

Core Issues & Questions:

Are there intersections between work functions which can then be compiled?

Which work functions do not strictly belong to the fixed qualification profile in terms of content and can therefore be removed here?

Which work functions are not part of the graduates' area of skills and can therefore be removed here?

Weigh up the listed work functions according to whether they are indispensable, useful or additionally important for the task.

The aim of weighing up the functions is to obtain a list of characteristic work functions which can be applied to as many trainee students as possible. On the basis of this scaled representation, select the work functions the training project does not need to include. Approach this phase fairly rigorously. Do not go into too much detail in the list. Making it as comprehensive as possible instead of rendering the list as representative and as applicable as possible can lead to an information overload when the time comes to finally determine the syllabus. As a guide-line, consider the following selection criteria: the course should be as applicable as possible for all trainee students; and work functions should be re-presentative of similar situations. Also bear in mind the potential learning content of the work function. If a work function previously designated indispensable is selected for removal, take into proper consideration whether there is a risk that the core task might not be fulfilled.

Go into detail on the remaining work functions. In this step, the project group takes the task system into account (knowing objectives, checking and set

conditions for tasks, execution, feedback). For each work function, discuss and answer the core issues & questions:

Sixth Step: Competence Analyzis

This stage of the approach makes the decisive qualitative leap between the task and the learning systems. While the curriculum selection and structuring phase has mainly focused on the work processes experts perform at work, the learning subject is now the focus of attention. How, it asks, can trainee students be guided systematically to fulfil the previously identified work requirements competently, safely and efficiently? What skills, knowledge and attitudes are necessary and how can they be developed systematically?

Due to the weight afforded methodical aspects in the didactic debate, the past two decades have neglected the problem of how to translate task system topics into learning system syllabi. However, our concept sets out at this point and explicitly encourages curriculum experts to translate task requirements into competences (competence analyzis) and analyse the learning steps necessary for the development of competences (didactic analyzis).

Work – according to the basic idea – is more than simply understanding predetermined reaction patterns to certain action stimuli. Work also implies active interpretations of task conditions and options and their reflected implementation. Consequently, learning must offer work more than simply enabling standardised reactions to work requirements. Instead, it must teach trainee students to manage their tasks in an informed, technical and proper manner. To be able to interpret, evaluate and process work instructions properly, workers should have extensive knowledge of the nature, effects and of the short and long-term consequences of their tasks.

The goal is therefore to acquire a broad range of action competences, which can be described in detail as follows:

> **Training Task Routines:** Certain work processes demand motor skills which need to be taught step-by-step. Training programs should introduce the student to these task routines in a didactically sound manner. Courses should also offer options for experimenting with work materials, or trying out and practicing particular types of tasks without letting initially mistaken actions lead to greater further problems. Mastering occupational task routines demands extensive knowledge of experience which – under circumstances – can only be perfected in the later course of the career.

> **Specialized Knowledge:** In the manner of traditional training concepts, trainee students should learn facts, terms and rules from their future line of work. This knowledge serves as the basis for a proper technical understanding of job tasks, enables communication among colleagues and forms the basis for self-controlled further training processes.

> **Action or Task Knowledge:** Besides their technical knowledge, workers also need knowledge of methods and processes to be able to act in a competent manner when dealing with products, work materials, procedural regulations, with other people involved and with one's own work.

> **Procedural Knowledge:** Workers can only work properly in complex situations and under unclear working conditions if they are fully informed of the circumstances, to which objectives, and with the aid of which prerequisites they are acting. They need proper knowledge of processes e.g. total work processes (work process knowledge), the company structure, the work process contexts, etc.

> **Knowledge of Design:** Today, workers are increasingly confronted with changing production conditions which demand an attitude open for innovation.

The sequence of the individual stages of acquiring expertise does not mean action competence is ordered likewise, in steps. Learning progress is more of a reciprocal process with several feedback loops.

The competence analyzis first lists the knowledge, skills and attitudes necessary for being able to perform a work function in a competent manner. Competences are requirements of knowledge and skills and of specialists' attitudes. Always phrase them in a specific manner to keep the reference to the core task evident (e.g. not "honesty" but "correct accounting of earnings"). On the other hand, they are described in such a general manner that they make sense by themselves (i.e. outside the reference to the table describing the work function).

Core Issues & Questions:

What specialized knowledge do the workers need to meet these requirements in a manner that the objective is fulfilled?

Which methods, processes and skills must workers be able to master to meet these requirements in a manner that the objective is fulfilled?

Which attitude is necessary on the part of the workers to meet these requirements in a manner that the objective is fulfilled?

It is not necessary to fill in each field on the form! The framework is not intended as a bureaucratic list of new competence specifications. Instead, it is supposed to offer inspirations for compiling existing ideas. Try to avoid repetitions. If the same competences are important in different fields within one work function, only enter the competence once in one field for the sake of clarity.

To tidy up the collection – still open until now – and strike less significant entries from the list, apply once more the categories indispensable, useful and additionally important.

The next step assesses whether the planned training program can impart the collected competences. A whole range of competences will turn up on the list which the restricted training period may be able to foster yet will not be able to form systematically. This includes competences (such as mastering basic arithmetic operations) which can be assumed as common knowledge at the beginning of the course, but it also includes general attitudes (for instance, executing tasks punctually) which the course of the training program might advance implicitly, but are hardly worth picking out systematically as a central theme.

Therefore, evaluate the fields of the list according to whether the listed competences (a) were generally acquired by the target group prior to the beginning of the planned course, (b) are acquired informally through everyday experiences and work experience, and (c) should be picked out as a central theme and systematically imparted in the planned training program.

On an extra form, list all of the competences which were deemed 'indispensable' or 'useful' and which also fall into the category "should be picked out as a central theme and systematically imparted in the planned training program".

Seventh Step: Didactic Analyzis

The constructivist school of teaching/learning research stresses that learning is not an automatic result of teaching. Instead, it is a highly individual process of linking the known with the unknown, of forming and testing hypotheses, and of generating subjective meanings controlled and initiated by the learner.

When selecting and structuring learning contents, take the following principles into account:

1. Knowledge reserves must attain subjective meaning for the learners in order to be learned with a lasting effect.

2. Learning processes should be designed in a manner which supports networked knowledge structures and structures which can be ordered in a hierarchical manner.

To fulfil both learning process design requirements, the didactic analyzis converts the specifications phrased in the competence analyzis into structured learning fields. This step must take four forms of knowledge into account the competence relies upon:

> Training programs which follow the aim of teaching action competence cannot be restricted to teaching terms, formulas or facts.

> The rules and principles which combine these facts must also be known.

> The trainee students must also learn and develop skills and knowledge which are based on procedures and application conditions.

> And finally, learners can only really grasp the meaning of learning contents if they are embedded in a superior meaning context and if they permit insights into general connections so that subjectively meaningful, networked knowledge structures can be developed.

For each competence specification, give answers to the core issues & questions:

Core Issues & Questions:

Which

> Facts and terms,

> Rules and principles,

> Methods and skills and

> Associative knowledge do workers need to
  meet these competence requirements?

The fields do not necessarily need to be filled in completely! The entries are only a collection and structuring aid to help gain as many relevant learning contents as possible. The entries are then checked, ordered and selected. This involves making the following queries:

Core Issues & Questions:

Are the terms, rules, principles, etc. necessary and sufficient

> To actively cope with the situation?

> To understand the task requirements
  and the work function?

> To critically assess and reflect?

Strike the entries which do not meet these requirements from the list.

Once the results of the task analyzis, the competence analyzis and the didactic analyzis are available

for all of the relevant work functions within an area of responsibility, introduce a halfway step to cut duplicates and omissions. As a guideline, answer the following questions:

Core Issues & Questions:

Is there a tendency for certain work functions to be so similar in terms of objectives, preconditions and task options that they can be conveyed in one block in the training program?

Is there a tendency for certain work functions to fall out of the context so strongly that it would make more sense to remove them from the planned training project (e.g. in the form of a specialization module)?

In the course of the discussion, were there indications of gaps in terms of the general profile or the core task?

Eighth Step: Developing a Module Structure

This step involves developing the actual modular structure of the training program. We recommend splitting the modules into knowledge modules and task modules which differ both in terms of the selection of syllabi as well as the teaching methods used.

Knowledge modules impart systematic basic knowledge. The trainees learn how to use the proper terms (technical terminology) and are taught general laws and rules. At the same time, knowledge modules offer the opportunity of critically questioning work conditions and situations, production procedures and market situations in terms of underlying constellations of interests, social and ecological implications and long-term effects. In my opinion, an understanding, which incorporates all possible

situations and development of subjective meaning structures beyond experiences bound to and isolated from actual circumstances, is only possible once specialized knowledge has been outlined in a conceptual and terminological manner and freed from concrete work requirements.

The so-called **task modules** use the knowledge and skills in the knowledge modules to refer to work functions. They structure the class syllabus according to content and methods in line with task processes. Trainee students can experiment with materials and work aids, can try out and practise how to use them properly, can gain knowledge of work procedures and methods and can experience work processes under learning conditions.

Again and again, the learning process systematically links to the basics imparted in the knowledge modules. This ensures that, in the course of the training program, students can apply the knowledge and skills acquired in knowledge modules to the context of application situations so frequently that they can easily be transferred to practice. Yet, at the same time, the extra instruction in the form of knowledge modules often makes frequent reverting to basic knowledge at a later stage redundant and helps avoid duplicates or omissions.

The differentiation between knowledge and task modules is not to be misunderstood as a division between theory and workshop classes. In their content and methodical structure, task modules can also be theory teaching units on task processes. Redundant syllabi in the modules and observations from different perspectives are not only essential, they are also a positive side-effect. In my opinion, adopting a mere technical or a task system mode of reflection leads to isolated knowledge reserves. These risk the process of acquiring the total overall view and applying knowledge flexibly to new situations.

In general, apply the following rule of thumb: As many task modules as possible and as many knowledge modules as necessary! Each of the work functions selected for training should be represented in a task module.

To identify the training syllabus bundled into modules, ask which results from the previous didactic analyzis could be used as a topic for an individual module.

Core Issues & Questions

Which learning topics and learning requirements do the different learning areas name?

How can these learning topics (or parts of them) be summarized under which generic term?

Can an own module be formed with this topic in the planned size?

Construct the individual modules after separately summarizing the learning areas. Modules are teaching units which either convey basic knowledge or teach trainee students to perform one or more work functions. In general, they should be of the same length so that certain topics can be split up and others put together – wherever this seems useful and possible.

The task module exams are practical exams followed by an assessment discussion; knowledge module exams are oral or written learning achievement controls.

The following elements are needed to describe and define the **modules**:

> The name of the module: in general, the name of a task module will correspond to the description of a work task or of a summary of several work tasks. Knowledge modules are named like the topic, yet can also include indications of larger theoretical topics (Mechanics I, Basics of Anatomy and Physiology).

> Number of hours.

> Categorization in the framework structure (a) in terms of allocation in a particular field of responsibility, and (b) in terms of affiliation to the compulsory field, the alternative compulsory field and the further training field.

> The work function (results of the task analyzis) or learning areas (results of the competence analyzis) to be mastered with the aid of the knowledge and skills acquired.

> The knowledge and skills to be assumed as common knowledge in the module (learning requirements) and the modules which help fulfil these preconditions,

> Exam requirements.

Conclusion

As a result of the task analyzis there is an ordered description of individual work tasks directly related towards task system structure characteristics.

The competence analyzis translates the task analyzis overview into the list of competences trained specialists need so that they can perform characteristic work functions properly and efficiently.

The didactic analyzis generates the list of knowledge and skills components a trained specialist needs to develop action competence.

The module construction phase therefore forms teaching units which are either knowledge modules or task modules.

Phase III – Putting the Curriculum into Practice in Class

No curriculum design will be of any use if it is not implemented and brought to life by teachers or trainers in lessons. Including experienced teaching staff at an early stage in the teaching plan development phase makes implementing the ideas in class practice a lot simpler and fosters acceptance for the project on the class level.

Besides imparting proper, relevant and understandable information, a good class is also characterised by the use of proper methods. Two factors seem particularly important:
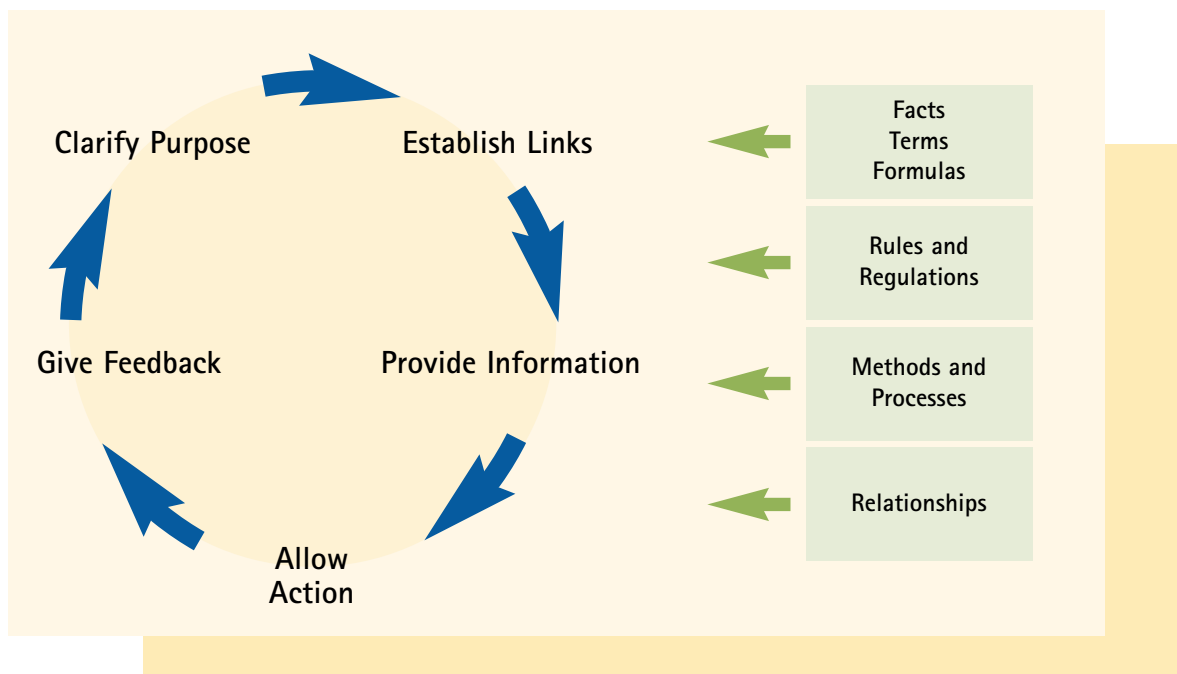
> **Methods should correspond to curricular objectives.** The teaching/learning method and the selected learning approach should correspond to the curricular objectives of the teaching/learning program. If acquiring factual knowledge is the aim, frontal teaching or programed learning can make more sense. If the aim is to teach problem-solving cognitive techniques, open learning methods are an obvious choice, and if motor skills are to be developed the 4-step-method is the measure of choice.

> **Facilitate active and significant learning.** Methods which address as many of the students' senses as possible bring them to deal with the subject matter more independently and permit different learning approaches and perspectives vis-à-vis the syllabus.

Learning – like work too – can be understood as a conscious and targeted action. However, when dealing with a certain subject, going over a particular area of knowledge once does not count as having 'completed' that topic. Both deeper understanding and proper acquisition will need several phases of

The Self-learning Cycle

Clarify Purpose — Establish Links — Provide Information — Allow Action — Give Feedback

Facts Terms Formulas

Rules and Regulations

Methods and Processes

Relationships

imparting, taking possession and reflection. Repetitions and practice phases are just as sensible as experimenting with application examples or as moments of critical reflection. Each of these learning loops contains certain steps where the sequences can be varied.

Ninth Step: Selection and Order of Syllabi

Clarify Purpose:
People are particularly motivated and determined to learn once they are aware of the actual point of learning. The students should therefore be clear about a particular program's formal (e.g. "This training program is the proper preparation for the theory part of the driving test") and subject matter purpose ("The training program explains the importance of traffic signs"). The planning phase must also regard personal priorities ("to me it is particularly important that...") and the institutional context of the training program.

Not only the objectives determined by the curriculum developers and lecturers or teachers are of core significance. The personal aims and attitudes of the students themselves are also of decisive importance. The perceived difficulty of a particular task, for instance, influences the degree of effort students are prepared to invest. Or, interest awakened in a particular subject also influences the extent of commitment to the learning process. Realistically assessing the use of a training program is therefore important for the students' decision in terms of the time and social space reserved for learning.

Establish Links:
The beginning of the actual learning process will frequently have to do with explaining the meaning of a particular subject (i.e. its purpose, its relevance for one's own life or links to existing knowledge) in order to direct attention and provoke interest in the subject matter.

It is therefore necessary to find out exactly how much the target group knows. When, for example, describing issues and questions only assume terms and concepts and name key terms students already know at this point in time.

In a second and third learning loop, the meanings of definitions can then be taught on a new level. At this stage, additional viewpoints can be illustrated, counterarguments can be explained and variations can be discussed, etc. However, each case should remember that meaning cannot be imparted to others, and can only be discovered by oneself.

Provide Information:
Normally, trainee students wish to acquire competence with reference to a situation which is considered problematic or to a particular theoretical problem. It is not only necessary to impart terms, formulas or facts (declarative knowledge), but also to acquire skills and knowledge of procedures and application conditions (procedural knowledge). Ultimately, sound learning is only given if the syllabus is embedded in a larger meaning context and allows for insights into more fundamental connections (contextual knowledge).

Allow Action:
For the learning process to have a lasting effect upon many learning/teaching objectives, it makes sense to let students apply the knowledge gained or put it into practice in concrete actions. The sequence of the steps Provide Information and Allow Action can be reversed so that knowledge can be gained from experience.

This does not simply refer to exercises based on repetition and routine. The learning process should take place in task processes which are as complete as possible and which contain elements of planning actions, performing actions and controlling actions. Complete actions offer numerous opportunities for meaningful learning:

In the planning phase, trainees must develop ideas of how to reach a particular task objective as efficiently and as reliably as possible. To do this, they must develop assumptions about the effects of individual task options which might or might not be confirmed.

Performing a task or solving a problem by oneself helps test mental suggestions against the reality of the situation and correct them if necessary. Trainees pick up routines, experiment and, as a result, develop an own style of performing tasks. Ultimately, students learn best from success and mistakes if they discover and correct mistakes by themselves.

To steer and reflect upon learning activities independently, learners need enough freedom, effective instruments or tools and knowledge of proper procedures. Opportunities for repetition also prove effective. These should result from different perspectives and contexts – to enable as much varied use of existing cognitive structures as possible.

Give Feedback:
Without proper feedback, there is a risk that misunderstandings go undiscovered and that the students get mixed up in false assumptions. Proper feedback interprets mistakes, indicates how mistakes can be made worthwhile for the learning process and ensures that the next learning step proceeds only once the previous one has been fully understood. Feedback should relate to the objectives and should bring students to evaluate themselves continually.

Competence-oriented curricula can build the basis of a training program which not only imparts knowledge and skills, but also teaches competence to take action and the ability to solve problems. It is therefore necessary not just to teach trainees how to fulfil individual tasks and to impart isolated facts but also to clarify relationships, contexts and causes. Whether this works obviously only depends secondly on the curricular design of the teaching and learning programs and in the first instance on lively cooperation in class.

Glossary

Areas of responsibility:
relatively abstract, summarized descriptions of task or function complexes which belong to a core task. Fields or areas of responsibility almost always pair the terms work objective/client together with a verb.

Competence analyzis:
explicates which specialized knowledge, which methods and processes, and which attitudes and personal behaviour are necessary to fulfil a work function competently.

Core task:
the core task of a training program outlines the tasks future graduates will fulfil which will clearly and distinctively characterise their actions.

Didactic analyzis:
step in the planning process which selects the necessary descriptions of knowledge and skills from a list of needed abilities.

Extended project group:
the core group (generally members of an institution) plus a fixed group of training and job experts who agree to develop a training curriculum for a certain period of time. There are between 8 and 10 people in an extended project group.

Framework structure:
defines the areas of responsibility training should apply to, determines the compulsory and alternative compulsory fields and makes general indications of the duration and scope of the training program.

Learning areas:
are topical areas treated in a training module. They are more extensively phrased or more neutral than learning objectives and leave the learners the freedom to decide the depth of knowledge they wish to attain. They are not operationalized, yet offer enough indication for formulating corresponding exam criteria.

Learning system:
is the type of inner logic with which subjects compare and test new knowledge elements against own hypotheses and with which they compile these in new knowledge structures. Elements of learning systems include terms, facts and formulas on the one hand, rules, principles, methods and processes on the other hand as well as general contexts.

Module:
teaching unit within a broadly defined training framework structure. Individual training modules, as part of a defined certification level, are not relevant for the labor market, but they do enable interruptions, can be taken into account as individual certificates by other institutions and allow resumption of the training course at a later point in time. One must therefore distinguish between training and specialization modules and – in the training module category – between knowledge and task modules.

The description of modules includes:
> the approximate duration
> the learning objectives to be reached
> indications of the topics for the exam.
In principle, students can sit exams for the purpose of recognising modules without having to attend the actual training course.

Project group:
fixed team of between 4 and 6 people who are nor-
mally affiliated with the institution which initiates
the planning of the training courses. The project
group is responsible for the entire planning process
in the first three phases.

Qualification profile:
consists of describing the core task, the graduates'
target position in the company hierarchy as well as
the desired level of certification in the education
system.

Specialized knowledge:
first comprises knowledge of terms and facts
(declarative knowledge), secondly knowledge of
rules, methods and processes (procedural knowledge)
and thirdly knowledge of contexts and general
effects (conceptual knowledge).

Task analyzis:
explicates objectives, task preconditions which need
to be tested/created, possible procedures or task
options and the possibilities of task control in a
work function.

Task system:
is the type of inner logic tasks or actions are based
upon. Tasks – in contrast to unconsciously performed
behavioural acts – are described as a sequence of at
least three steps: defining the objective, executing
the task and monitoring the action.

Work functions:
concrete, planned work tasks which are repeated in
the course of the work day. Normally, they are
paired in terms of a work objective or client together
with a verb (as well as certain restricting conditions
or specific characteristics from time to time). Work
functions are complete actions, i.e. they comprise
the planning, execution and control stages of the
work process.