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Theory and practice of the project-based method

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InWEnt

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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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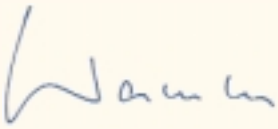

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1 Introduction to the topic

More participatory education

The traditional teaching methods, which consist of merely passing on information, are usually geared to individual learning activities. At the same time, research done into the quality of teaching-learning processes in the area of vocational training emphasise the importance of promoting a more participatory concept of teaching that does not neglect aspects of professional practice.

Acquisition of new skills

The current social and technological changes of the labour market make it increasingly important to acquire "new" skills, such as the ability to work in a team or to find and select relevant information, the mastery of communication networks, the co-ordination of efforts and the ability of networked thinking and acting. But, despite all this, how can students learn about professional practice if the teaching methods involve no more than a teacher rattling off explanations and students having to study from a textbook?

Profound changes in skills and competence

This new educational concept requires profound changes with respect to the skills and competences that teachers must possess. The task of educators, as V. M. Candau (2002) points out, cannot be reduced to simply passing on knowledge. Rather, teachers must offer their students challenges and pointers about work life, so that they can help them to position themselves and find their way around certain areas in a critical, active and creative way, instead of teaching them how to be agents of social change.

Educating students by creating learning situations

If this concept is extended to vocational training, then we need to educate students by creating learning situations that are linked to the actual development of the action. So it seems proven that the constant improvement of learning requires students to be strategists or, in other words, to be able to plan and co-ordinate resources, determine the objectives of each situation, know what is expected and, consequently, to be able to implement adequate strategies to achieve the objectives. But this also requires a more constructivist concept of learning.

Project-based pedagogy

It is in this context that project-based pedagogy becomes especially relevant. The project-based method, which is more than a way to develop a curriculum (structuring curricula around real tasks linked to professional practice), allows for an active and constructive way to develop a central didactic principle that integrates several skills and competences (related to the subject matter, the methods, the learning process and social competence) through real work tasks and processes. In this sense, the project-based method becomes a very effective tool that replaces traditional frontal education in the classroom with learning situations.

2 What is the project-based method?

The concept of the project-based method is linked to a certain form of understanding and organising teaching-learning processes.

Learning strategy

According to the definition found in the German Dictionary of Pedagogy in Vocational Training, the project-based method is a learning strategy that ties teaching to the development of work tasks (projects) or central topics in an integrated and practical manner, with students participating actively and independently. This project-based method allows them to acquire knowledge and skills in an independent and practical way, while developing their social skills at the same time.

Pursuant to this definition, the project-based method is thus a learning strategy based on the following:

- fulfilling a complex task or approaching a real problem that involves different areas (interdisciplinary focus)
- active, constructive and independent participation of students in the planning, realisation and evaluation of a project
- self-organisation and self-reflection of those participating
- types of work based on co-operation and negotiation
- a previously established period of time (duration) and certain resources (equipment, materials, budget)
- and on real results achieved by students at the end of the programme.

3 Framework conditions for implementing the project-based method

From passive to active learning:

Active and constructive participant

The student becomes an active and constructive participant in his/her own learning process. This way, the student will have to find a solution to specific problems through reflection, intuition, understanding and experimentation. The project to be completed will be the student's key motivating element and pave the way for his/her active participation. In must be designed in such way that the knowledge conveyed forms a dynamic structure and not something static. The educational models based on the passive absorption of information lead to an accumulation of facts that the student fails to integrate. The project-based method implies a constructivist concept of learning. The participants, over the course of the project, then set about putting their knowledge into practice, which is further enhanced with such knowledge and skills as are imparted by the teacher and the situation and context of the project.

Moving from knowledge based on data to knowledge acquired by method:

A better understanding of the processes

If students are to be capable of planning, taking decisions and applying appropriate strategies in order to achieve their objectives, then we cannot reduce the objectives of education to the accumulation of isolated information and skills; instead, we need to assist the student in gaining a better understanding of work processes as well as functional and social interdependencies.

Moving from directed education to self-directed education:

Continuing self-teaching

The drastic changes in production technology and work organisation make it necessary for students to develop the ability to take decision and solve problems independently. Apart from new skills required to adapt to such rapid and ongoing change, students are called upon to continue to teach themselves.

Educators, who used to be executors of curricular development, are becoming designers and moderators of learning environments:

Re-interpreting the curriculum

Today it is almost inconceivable that teachers should be no more than executors of curricula. The new profile of educators has resulted in teachers participating, together with experts, in designing and re-interpreting curricula in the proper context; they also take decisions with respect to the requirements derived from work practice, filter and re-define them in accordance with specific demands arising from the performance context.

Moving from systematic education based on subjects to interdisciplinary education.

Learning effect not guaranteed

Educational processes predicated on completing projects constitute a rejection of contents clearly structured and defined in favour of a system that focuses on the complexity of life and the working world. An education that is solely based on learning mathematics, chemistry or physics from an almost neutral perspective does not guarantee any lasting learning effects. To create such learning effect, one must study these subjects, but that must be accompanied by a distinct learning strategy that involves asking oneself: what and whom is the project for?

Applying an interdisciplinary approach

Teachers today, isolated in their classrooms or workshops, have no sense for the demanding work of curricular development. For this reason, it is necessary to look beyond one's area of specialisation and to start thinking in interdisciplinary terms. In addition, with the separation between manual and intellectual labour gone, as a consequence of the interdisciplinary tasks of the projects, the aim is to increase professional qualifications as well as general education.

4 Organisational phases of the project-based method

Interactivity

The project-based method is carried out by means of a process that requires a careful action plan. Actually, it is not a single process, but a combination of processes (phases) that are linked to each other. The work process comprises six phases, and during each phase different types of tasks are performed. In that sense, the phases are not independent of each other; even though they belong to different stages or phases of the project, they are still interactively linked to each other. According to Dewey (1989), it is not a sequence of unrelated acts, but a coherently organised activity where one step is taken in preparation of the following and where with each step everything that has been done or that has resulted is added in an accumulative fashion.

Project = a learning strategy

The following illustration (see chart 1, Phases of the project-based method) shows a synopsis of the necessary steps to develop a project as a learning strategy (for a more detailed analysis, refer to the manual "The Project-Based Method in Vocational Training", R. Tippelt, A. Amorós).

Success of a project

The success of a project is determined by its objectives and whether they are clearly formulated and whether the scope for action and responsibility that the project team must assume is sufficiently specific.

5 Definition of learning goals and objectives – selecting a work topic

Definition of goals and objectives

The first step in planning a project involves the definition of learning goals or objectives that students are supposed to achieve. What qualifications are to be achieved, then, through project work and at what point during the project? Is it a project that serves to convey the fundamentals of a certain subject or discipline or is it an interdisciplinary project (such as one that involves the carrying-out of tasks related to the maintenance and repair of production equipment among a team of apprentices from different professions)?

Developing products or services

The principle and the purpose of the project-based method is the development of products and services. They must be utilitarian as well as relevant and important to students. The products to be selected should be geared to the learning conditions of the students and to the demands under the framework education plan (curriculum). At first, it is recommended to start with the development of less complex products or topics and with requirements that should not be set too high. As students are gaining more experience, they will be able to realise more extensive and demanding projects.

Level of independence

The point to which students' ability to work independently is supported during the planning, implementation and control of the work depends on the degree of independence that the teacher wants students to achieve. This may range from limited independence (the teacher limits the scope for action and takes decisions) to a maximum level of independence (high degree of participation in the deci-

sion-taking process with respect to the make-up of the group, contents and organisation of the training programme). For this reason, before starting a project, it is always recommended that the teacher define the students' level of involvement. Generally, this process is carried out gradually. The teacher, taking on a predominant role, paves the way for an increasingly active involvement of the students and, consequently, a higher level of students taking responsibility for their own work. Instead of acting as an instructor, the teacher gives advice; rather than just conveying contents and information, the teacher controls and assists in the structuring of the learning process.

Specific learning group

In the case of applying previously used projects, this should not become just another way of introducing students to professional practice in mechanical fashion. Each project is designed for a specific learning group. Therefore, it is always prudent to adapt, step by step, project ideas to the demands emanating from each learning situation.

The subsequent questionnaire then serves as a guide for the teacher to assist him/her in formulating tasks: all the planning of tasks involves the following aspects that the teacher must take into account. (See "Task Planning")

Controlling the conversation

During the task planning, the teacher is in charge of controlling or moderating the conversation. In his/her instructions, the teacher should follow the order mentioned before. In the event of more extensive tasks, the teacher must decide whether to hand out the task description in writing or whether to have students take notes during the explanations of the task. The teacher only answers those questions of students that involve contents that they find difficult to develop or that they cannot develop. As soon as the students have a handle on the contents, the teacher will answer the questions of a student or group by raising another question:

> "How would you do it?"
> "Where can you find information?"
> "Where in the material do you find these data?"

Task planning

Who? carries out:	**Which students? Which group?**
What?	**What product / services, what partial task?**
For what purpose?	**What is the purpose of the task? Why is it necessary?**
How?	**What steps to take? Planning sequence?**
By what means?	**What is the procedure? What tools, equipment?**
Where?	**Where should the task be carried out?**
When?	**Delivery deadlines, including intermediate steps.**

Setting a task for the entire group
Posing a problem to groups or sub-groups:

> saving time
> guaranteeing that everybody receives the same amount of information

Setting a task for smaller groups:

> facilitating dialogue (participants talking less, but asking more questions)
> allowing for information to be adapted to recipients (students)
> facilitating organisation (the following dialogues, too, are phased in at intervals)

(Source: PETRA project, Siemens)

6 Development of project documentation – guiding questions

Detailed analysis

Before preparing the documentation for the project, it is necessary for the teacher to carry out a detailed analysis of all the individual steps in the process. Based on such analysis, it is possible to identify all the learning activities, skills and information necessary for the project. It is precisely such analysis that forms the prerequisite for arranging in an effective sequence all the steps that students need to complete.

Definition of the guiding questions

The results of the analysis are integral components of the project documentation and, at the same time, make up the conceptual and procedural framework on which the guiding questions are based. (See The guidance text method, in "New forms of teaching-learning for in-company training", R. Tippelt/ A. Amorós)

Support tools

The guiding questions are organized in such a way that the questions need to be mapped out and applied appropriately throughout the development of the project. Apart from serving as a support tool for achieving the objectives of the project, its main function is to encourage students to teach themselves. As a result, the guiding questions must take into account the most relevant steps in the solving of the task - from the information stage to the stage of assessment:

Stages of the project-based method

1. Information / definition of goals	Developing and setting out jointly a problem for a project. Compiling information to resolve the task.	Active participation in the selection of a real problem or task rouses the interest of the learners and makes them get involved more. Fostering the ability to know where and when to look for information.
2. Planning	Planning process for the work plan. Tasks are assigned to members of the group. The group is fully responsible for all activities.	Fostering the ability to plan the procedure autonomously with respect to contents, the methodology and division of labour.
3. Decisions	The group members develop their own strategies for solving the problem and take decisions (almost always in prior agreement with the teacher) about which strategies to pursue.	Fostering social competences related to teamwork and negotiation
4. Implementation	Each member of the project implements his/her task according to plan or work-allocation schedule that is based on partial results.	Allowing for actual autonomous, creative and responsible action. Fostering social competence.
5. Control	Self-control by students ... possibility of identifying one's own mistakes and, if possible, of correcting such mistakes.	Learning how to evaluate better the quality of one's own work. Fostering the ability for reflective and critical self-assessment.
6. Assessment	Combined monitoring (teacher, students), discussion and assessment of project results. Theoretical consolidation of the results.	Assessment of the learning experience. Awareness for interdependencies between specialised theory and practice. Identification of intersections with other learning contents.

1. Information
> What needs to be done?
> What purpose does the task serve?

2. Planning
> How to go about it?
> What operations or steps are required?
> By what means can the task be carried out?
> Why does it have to be done in this way and no other way?
> Where can the task be carried out?
> How long does it take to solve the task?

3. Decision
> Specific procedure / solution of task

4. Implementation
> According to students' plan

5. Control/assessment
> Does the work fulfil quality requirements and if so, up to what point? (self-assessment / external evaluation)

Central role

There is no need to prepare guiding questions for every aspect related to technical information - only for information that plays a central role in the resolution of the project or information that is considered worthy of deeper analysis or that must be acquired for the first time. The following illustration (see Chart 2, Scorecard model for guiding questions) shows an example of how to summarise the process:

Scorecard model for guiding questions

Work sequence	Technical know-how	Guiding questions	Source of information

7 Data and information that a training model must contain

- What is the reason and purpose of the project? Who are the results for?
- What are the objectives of the project? What are the technical-professional objectives and what are the objectives in respect of interdisciplinary learning?
- When are the results to be delivered and presented?
- What are the partial results and when are the intermediate deadlines (e.g., following the planning phase) at which time the teacher must be informed of the project's progress?
- Selection of project participants
  - based on qualifications
  - based on level of education
  - based on profession/interdisciplinary areas
- If necessary, appointment of a "project co-ordinator" by the teacher or the project group.
- Definition: decision-taking competence and scope of responsibilities of project participants
- Definition of decision-taking competence and responsibilities of the project co-ordinator or spokesperson.
- Identification of the necessary resources
  - materials
  - time
  - money
  - support of...
  - advice of...
- Qualitative description of the intended results (level of precision, level of transfer and depth of information/knowledge)
- Detailed information on person or persons to whom results will be presented and on how to present the results (written or oral presentation). Demonstration and presentation of results, etc.
- How to supervise partial results?
- Who has to report to whom?
- At what intervals should co-operation within the project group be discussed and when should such discussions be scheduled?
- What is the role and responsibility of the teacher (in his/her capacity as a learning instigator and pedagogical adviser) within the framework of the project?
- Who should supervise the disciplinary aspects and how (attendance, breaks, etc.)?

(Source: M. Herzer et al., in: Gestión de Proyectos)

8 The role of the teacher in the learning-by-project process

Process planning

As was pointed out before, the teacher's tasks cannot be reduced to ensuring that students learn the core theories of certain disciplines. Instead, it is also about creating and designing learning environments and situations that lead, through practical action, to the attainment of the objectives. This way, the planning of learning processes becomes a central task for the teacher. According to P. Dehnbostel, the teacher becomes an adviser or consultant who helps to give structure to the learning process. The principal changes in the role of teachers can be summed up as follows:

- The teacher puts intense efforts into preparing learning processes.
- The teacher creates relevant learning situations, so that students get involved both in cognitive and affective terms.
- The teacher tends to stay outside of the direct work process, observing the project's progress.
- The teacher provides or facilitates a "pool" of information sources, moves up to the second level and only intervenes when all other resources have failed.
- The teacher is not only an expert with respect to the contents (technical competence), but also an expert in methodology and social issues (methodological and social competence).
- The teacher brings about creative thought and critical thinking through shared learning.
- The teacher fosters independent evaluation of work processes and experience.
- The teacher assists in establishing links between already acquired knowledge and new knowledge.
- The teacher pays special attention to processes related to co-operation, work organisation and the methodology of group work and addresses these topics in intermediate evaluations and interviews.

As M. Herzer (1997) pointed out, and as is shown in the following illustration, we can group the functions of a teacher into four large categories:

Selection of Projects

- Analysis of learning opportunities
- Striking a balance with the level of education
- Selection of trainees

Preparation of Projects

- Definition of scope (contents/time)
- Definition of work objectives
- Definition of learning objectives
- Development/facilitation of auxiliary tools for self-monitoring
- Assessment planning
- Planning for project-monitoring

Acting as Project Adviser

- Encouraging students to be independent
- Motivating students to ask questions
- Stimulating thought and reflection
- Ongoing counselling for the team
- Acting as driver of project methodology

Project Monitoring

- Systematic discussion of the learning experience
- Encouraging self-reflection
- Mapping out the next steps in the learning process
- Eventually, selecting and planning a new project.

9 Project monitoring – evaluation under the project-based method

Shared responsibilities

Unlike a technical and complex process responsibility for which could fall only to an expert, evaluation in this context is seen as a process where responsibility is shared among all those involved in the development of the project. That is why feedback processes become an indispensable element both during the development and at the conclusion of all projects.

Receiving feedback

For students it is important to receive feedback not only on the results of their work, but also on their learning behaviour during the planning, implementation and self-assessment of the task. Students are supposed to make the learning objectives their own, as well as the criteria they use to evaluate them, because this is crucial in deciding what action to take and in directing one's own learning process.

Systematic observation

The main method of evaluation that we employ is systematic observation, which accompanies the whole operation. It is evident that, in constructivist models - which is true of the project-based method - that attach a high level of importance to the teaching-learning processes, techniques of systematic observation become more relevant. (This does not mean at all that other valid evaluation tools cannot be used - it all depends on the focus of the respective training programme.)

Learning behaviour

All manner of feedback discussions between the teacher and students requires that systematic observations have been made of the group's learning behaviour during a specific task or action. The teacher's observations must focus on learning behaviour actually observed, for example:

- Do students plan tasks systematically, for example, by referring to the guiding questions?
- Do they use, for such purpose, the relevant work materials?
- Do they adjust the implementation of the task to the original work plan?
- How do students relate to each other when working as a team? Do they consider the opinions and suggestions of every group member?
- What didactic material do they use?

Effective feedback

In short, one needs to observe what "actually occurs" in the group during the implementation of the task. The teacher can only provide effective feedback if and when he/she has observed specifically the learning behaviour and taken written notes.

Key competences

The appendix (see the appendix, Observation of group development & Sample observation profile) shows a sample observation questionnaire for learning behaviours (PETRA, Siemens). For each key competence, three criteria have been set out that can be observed, documented and discussed in the feedback. Each key competence comes with an assessment scale of four categories A, B, C and D.

Presentation on the progress of the project

In addition to systematic observation, the teacher has other methodological tools that he/she can use in the evaluation: presentations on the progress of the project and evaluation interviews. Presentations on the progress of the project are valuable tools to give some structure to the experience gained from the project and to be able to reflect on the process achieved, its difficulties and progress. Also, as the Buck Institute for Education points out, when students report on the progress of their project, it allows the teacher to base his/her evaluation of the development of the project and the material acquired by the learners on several elements. It is recommended that all projects should have one or more public progress reports in order to assess the results

related to the project work. This will give students not only an opportunity to demonstrate what they have learnt, but will also increase the validity and authenticity of the project evaluation. The monitoring of the project's progress can serve as a tool to detect problems, adapt strategies and review the achievements of the group. These may include:

- Problems in understanding how to carry out the activities of the project.
- Achievements in students' progress.
- Motivation/participation of students and groups.
- Problems/achievements with respect to activities or results in particular.
- Unexpected achievements
- New strategies set out by students and groups
- Specific resources and instructional support that students may require."

Evaluation interviews

The purpose of having evaluation interviews is to have students participate actively in the learning process; knowledge of and the ability to control directly the results increases their motivation.

Self-regulation

The teacher's tendency to allow students to assess the results of their work themselves is seen as proof of his/her confidence in their competence and responsibility. As a result, students feel even more motivated when faced with the implementation of the task and self-regulation.

Assessment sessions

In this case, it does not only involve the experience gained from technical work, but also experience from methodological work, individual and social experience that students have acquired as part of the project. The teacher should schedule regular assessment sessions with the students at predetermined intervals throughout the project, as this makes up an important element of self-regulation and self-monitoring.

Self-regulation allows students to do the following:

- review and correct their work themselves
- become aware of the quality concept
- identify mistakes and their causes
- become aware of what they have learnt as well as of the processes that have enabled them to acquire new knowledge
- have an idea of what it is that they could do more effectively or differently the next time.

Controlling the conversation

The evaluation interviews with a team of students are not easy. Generally speaking, the teacher becomes a "moderator", that is, he/she should control the conversation, keeping it at a second level, and encourage students to list and express conclusions and, finally, be critical, thus highlighting contributions and the importance of the conclusions (see appendix, Guide for evaluation interviews with a group of learners).

10 Possible limits to the proper functioning of the project-based method

Barriers and obstacles

There are several factors that can limit or interfere with the proper functioning of this method. These barriers or obstacles can be of an organisational nature (no institutional and organisational conditions such as time available for the project), technical (availability of necessary technical means such as equipment with the required tools) or motivational (taking into account the interests and motivation of students). It is also obvious that the proper functioning of a project always depends on the pedagogical quality of the teaching staff.

Main problems

As part of a research study, the Monterrey Institute of Technology and Advanced Studies has prepared a list of the main problems observed by researchers and that every teacher should always take into consideration with respect to making this method function better:

- **Time:** research and discussions often take up more time than expected. Exploring ideas thoroughly also takes more time than relying on superficial and known sources of concepts.

- **Knowledge of the guidelines of the study programme:** teachers need to select the lead questions carefully, so that students can learn the contents required under the programme.

- **Classroom administration:** students need to be sufficiently free to discuss their research, but teachers must maintain order so that students can work productively.

- **Control:** teachers often feel the need to direct the lessons in order to ensure that students receive the correct information.

- **Learning support for students:** frequently, teachers allow students too much independence without an adequate thought model, structured situation or feedback.

- **Use of technology:** teachers who have not used technology as a cognitive tool find it difficult to incorporate it into their classrooms.

- **Evaluation:** Teachers have difficulties designing a system of evaluation that a majority of students will understand. The results they expect of their students do not always require them to synthesise information or generate new conceptual representations. What is more, the evaluation of these results is difficult.

(Source: Monterrey Institute of Technology and Advanced Studies)

11 Conclusions

Constructing one's own knowledge

The pedagogical practice of the project-based method involves a different focus from traditional education.

As far as the teacher is concerned, it is essential that he/she be confident about his/her educational work and the principles by which he/she is guided. It is also crucial that he/she helps students to think for themselves, construct their own knowledge, select information and build up their own values.

A high level of demand

Even though the project-based method evolves within a framework of reference and follows a theme, it is always subject to spontaneous elements, improvisation and, in short, anything that comes with a high level of demand. The new role of teachers, therefore, as counsellors and advisers, is much more demanding.

Constructivist planning

This idea is also shared by Dehnbostel and Dybowsky (2000): In general terms, both for teachers and trainers, making the transition from an instructive to a constructivist teaching style requires a total redefinition of the functions involved - be it at companies, training centres or schools (see chart 3, Principles of teaching and learning). Up to now, a teacher would teach, demonstrate and explain. Now, with the new models, the teacher counsels and structures processes.

Multi-dimensional profile

The new type teacher will have a multi-dimensional profile that incorporates both pedagogical and professional competences. His/her training is broad-based and focuses on knowledge about work processes and key competences, allowing him/her to teach within a larger professional group and related fields. This will open the doors for a university discipline that could be called "Pedagogy of Vocational Training & Education".

Fostering knowledge in action

With respect to students, preference is to be given to the model where students acquire such skills as dialoguing, planning and interacting with others, being critical and taking responsibility for one's own learning process. In conclusion, the work projects foster "knowledge in action" (Barnes), as opposed to traditional "school knowledge", which is based on memorisation.

Wide range of techniques

From a methodological point of view, the project-based method, on account of its different stages of implementation, allows for a wide range of teaching-learning techniques to be applied - from a more traditional form where the teacher provides explanations to a more innovative method such as the conceptual map. Implementing a constructivist learning process does not mean that the stages of knowledge disappear; instead, these will be integrated in more active learning forms and contextualised.

Constructivist and instructivist teaching and learning principles

Passive learning (student receives information), very linear and systematic	Learning is an active and constructive process, self-directed and based on situations, the results of which are therefore unpredictable.
The teacher teaches, demonstrates and explains; the student imitates and incorporates	The educated person takes on an active role that is strongly influenced by his/her own decisions. The teacher becomes an adviser or consultant who helps to give structure to the learning process
The content of learning is considered a closed system made up of know-how and various elements	Contents of learning and know-how are not defined in isolation; instead, they are conceived of in relation to individual and social contexts.

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Appendix

Department of Vocational Training

Observation of group development

Location _____
Teacher _____
Date _____
Sheet _____

Profession studied: _____ Specialisation: _____ Year of training: _____
Task: _____ Level: _____ Group: _____

I. Organisation and implementation of task

Systematic planning of the implementation of the task _____

Systematic implementation of the task _____

Intermediate monitoring/control during the project _____

Level of key competence achieved: A ❑ B ❑ C ❑ D ❑

II. Communication and co-operation

Co-operation with the group and other external persons (e.g., customers) _____

Sharing of roles adequate for the situation _____

Visual display of the learning results and the work _____

Level of key competence achieved: A ❑ B ❑ C ❑ D ❑

III. Application of learning techniques and scientific work techniques

Methodical application of work documents

Methodical acquisition of learning contents (knowledge)

Logical and creative procedure (problem solving)

Level of key competence achieved: A ❑ B ❑ C ❑ D ❑

IV. Independence and responsibility

Responsible compliance with the norms of safety

Awareness of quality, of costs

Assumption of (co-) responsibility

Level of key competence achieved: A ❑ B ❑ C ❑ D ❑

V. Time constraints (capacity for extra load)

Constant concentration, degree of attention

Persistence in planning and control of the project

Ability to adapt to changes

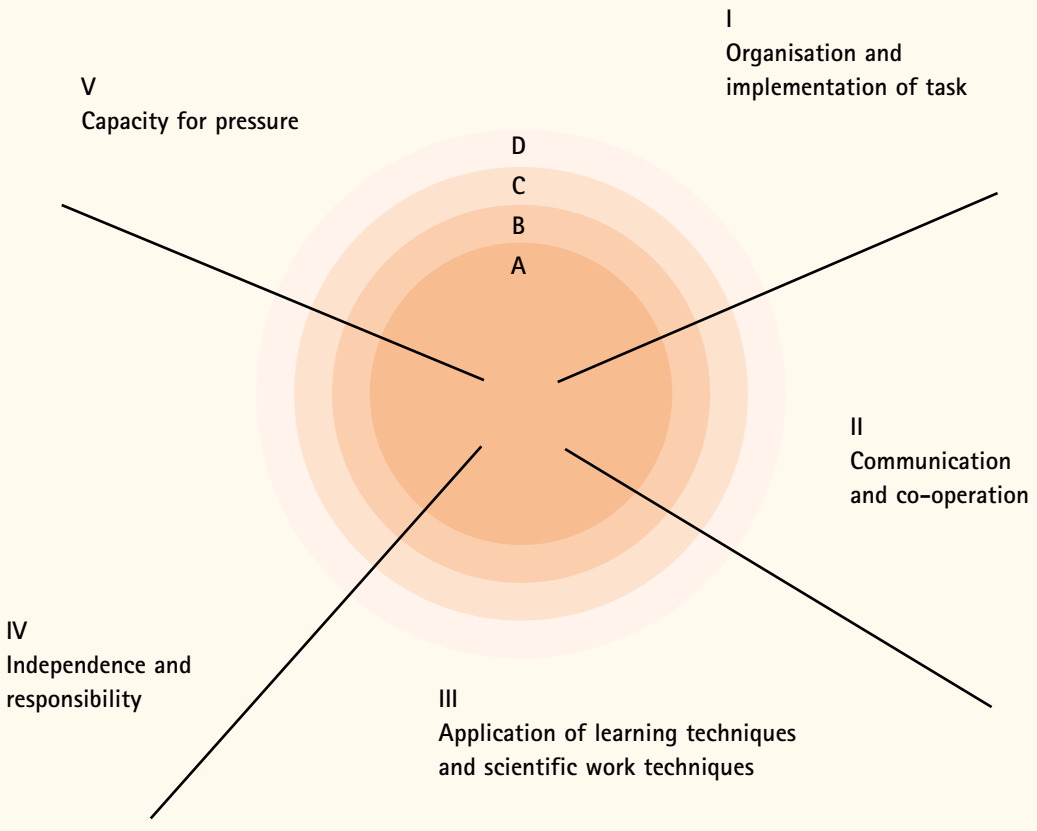
Level of key competence achieved: A ❑ B ❑ C ❑ D ❑

Hand this form to the student after the final interview!

Department of Vocational Training

Observation profile

Profession studied: _____ Specialisation: _____ Year of training: _____
Task: _____ Level no.: _____ Required time: _____
Type od organization: _____ Group size: _____



Legend: A Reproduction B Re-organisation
C Transfer D Problem-solving

Key competences: Expected profile _____
Profile observed _____

Guide on how to conduct group evaluation interviews

PROJECT

How was the problem set out and what were the objectives?

Would you include additional tasks or would you have liked to be given additional tasks? If so, which ones?

What was the most relevant aspect of the task?

How did you deal with the task? What steps exactly did you take and what prompted you to proceed in such manner?

What were the problems encountered and what solutions did you think of?

What decisions did you have to take? Explain to me why you opted for this procedure/solution. For what reason did you discard other ideas?

In your opinion, what struck you as the most difficult? What were the new aspects for you, the ones that gave rise to difficulties and uncertainty?

EVALUATION OF THE RESULTS

Does the (partial) result of your work correspond with your expectations?

What assessment do you deserve based on the results of your work?

What errors and mistakes were made? Why?

How were those errors corrected?

Based on this experience and in view of another project, what would you do differently, what would you avoid and what would you elaborate on? At this point, what could be improved?

Are there any aspects that you would like to analyse more thoroughly? What would you like to know (i.e., anything I could clarify or explain)?

BENEFITS OF LEARNING

What were the most important milestones of success?

What did you learn in that phase of the project?

What questions still await an answer? Is there anything you are not sure about yet?

After this experience, what other project would you like to tackle next?

What technical projects appeal to you at this time?

What are your learning objectives with respect to the immediate future?

What is the level of support that students need to receive from the teacher in the immediate future?

TEAM WORK - LEARNING EXPERIENCE

How was the work organised within the team? Were tasks or roles shared in specific ways?

What was your experience with respect to team co-operation?

What role did each team member play and why?

What were the repercussions of sharing tasks and roles on the work process?

How would you organise teamwork in your next project?

What are the three most important things you have learnt about teamwork that you would also recommend to a new student?

What could project fails?

What could be done (reinforced) to make sure that the next project truly succeeds?

(Source: M. Herzer et al., in: Gestión de Proyectos)

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InWEnt Mannheim in figures:
former: Industrial Occupations Promotion Centre (ZGB) of the German Foundation for International Development (DSE) Employees: 24 Annual financial budget for international human resource development programmes: approx. 6 million euro; a further approx. 4 million euro per year are made available by federal states cooperating in joint projects Annual number of participants: approx. 950