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Guide for Company Explorations

to promote cooperation between companies and vocational schools

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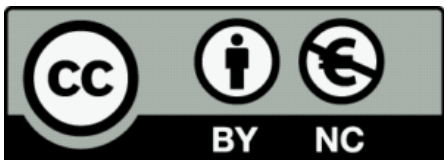

Brescia/IT, Darmstadt/DE, Liepaja/LV, Plock/PL 2019

Project group „Motivating young Europeans“,
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Foreword

The "Guide to Company Explorations " was developed as part of the project "Motivating young Europeans”. It was supported by the EU Erasmus+ Program Vocational Training from 01.10.2017 to 30.09.2019 under the project number 2017-1-DE02-KA202-004129. In the project, vocational schools from Liepaja / Latvia, Plock / Poland, Brescia / Italy and Darmstadt / Germany cooperated with the innovative company Merck KGaA that has its roots in Darmstadt and the Darmstadt Rhein Main Neckar Chamber of Industry and Commerce.

The aim is to weave a sustainable network of European vocational education centers by means of different forms of learning cooperations, that offers learning stays for apprentices abroad for IT, electrical, mechatronics, metal, gastronomy and automotive professions in the context of an EU town twinning.

The guide is based on experiences that participants of the project have gained in concrete company explorations during the project duration in the partner cities in Darmstadt, Plock, Liepaja, Brescia and on the results of the M+E Qualifizierungsnetz-werk project group.

The guide is to be used to bring together teachers and vocational training managers in companies and to assist in the planning, implementation and evaluation of company explorations. Project participants agree that the cooperation between teachers and company trainers is very conducive to the training of young people. Important insights can be gained for the design of vocational training processes at the learning venues company and vocational school. Therefore, this guideline should contribute to develop the cooperation between vocational school and company practice as well as between vocational school and company.

We would like to point out already at this point that for a profound company exploration, as described below, certainly more time will be needed than half a day.

However, the experience of the project group shows that it is very difficult to take instructors and employees of a company or teachers out of their daily work routine for several days. Therefore, the time factor is an important planning criterion. Thus the objective and the procedure of the exploration must be narrowed own and prepared well, so that your exploration benefit is high.

Feel free to visit https://bit.ly/2xmjNyp for the project "Motivating young Europeans".

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1. Company explorations - planning a lesson in a vocational context

1.1 Company Explorations

Vocational training is a challenge for everyone involved. In order to learn a profession, the knowledge, mediation and practice of real professional work tasks and processes are necessary in the classroom. Therefore, vocational training should consistently be based on professional work and business processes. It should also give a high priority to customer-oriented behavior in order processings. However, this claim can only be fulfilled if the trainees acquire their professional competence mainly through the handling of job-typical tasks.
Teachers in vocational schools do not always have opportunities to experience company operations themselves. Company explorations offer the opportunity to take a closer look at the operational reality on site. They serve the purpose of getting to know typical jobs and concrete work tasks of the specialist staff. Active company explorations will therefore form the basis for a sound design of school-based learning arrangements and provide starting points for further cooperation with companies.

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Importance and benefits of company explorations:

- Company explorations are geared to the business processes (unlike factory visits or company excursions)
- The exploration of these business processes (including production or training processes) serves as a basis for the development of various school-based learning arrangements and for an improved understanding of professional activities.
- •The planning and preparation of company explorations help specify training objectives and educational goals. Because representatives of the company and teachers cooperate continuously there is a added potential for further training projects that are jointly planned and organized.
- Company explorations are aimed equally at vocational school teachers as well as company employees with training tasks (trainers):
  - They are developed with a keen eye on the requirements of both the curriculum and the professional activities.
  - They form the basis for one or more lesson situations that are oriented on business processes.
  - They give everyone involved an opportunity to clarify which qualifications / skills are required in certain parts of the professional practice.
  - They provide another basis for the continuous exchange between schools and companies.

A fertile co-operation between the learning venues vocational school and operational reality can be measured by the ability to develop a school curriculum based on individual teaching arrangements (teaching modules), the focus of which is the processing of real professional tasks, assignments and projects

Vocational education is designed to develop a comprehensive occupational competence. Above all, the trainees should be enabled to independently plan, carry out and assess vocational learning and work tasks. The learning tasks are usually embedded in company work and business processes to reflect the complexity of modern business reality. Whoever wants to present this in the classroom, must therefore know the operational realities.

1.2 Clarification of terminology and "historical" context.

Nowadays, business processes cannot be limited to individual departments. Nor can the expertise needed to handle company task be limited to individual departments. The age of Taylorism is largely over, this is particularly true for larger companies. The artificial separation of the production process and the associated splitting up of complex tasks into separate individual works will hardly be found in today’s operational reality. The extensive restructuring that has been carried out in many companies over the past years has also had an impact on vocational training and needs to be considered. This accounts for new demands on skilled workers and industrial/office clerks. In addition to their specialist knowledge, skilled workers / office clerks now require a variety of competences to be able to carry out their tasks in a qualified manner. Lean production, Kaizen and Continuous Improvement Processes (CIP) are the magic words that have accounted for significant increases in production in the last decades, not only in Japan. While Taylorism was based on a clear separation between dispositive activities -such as

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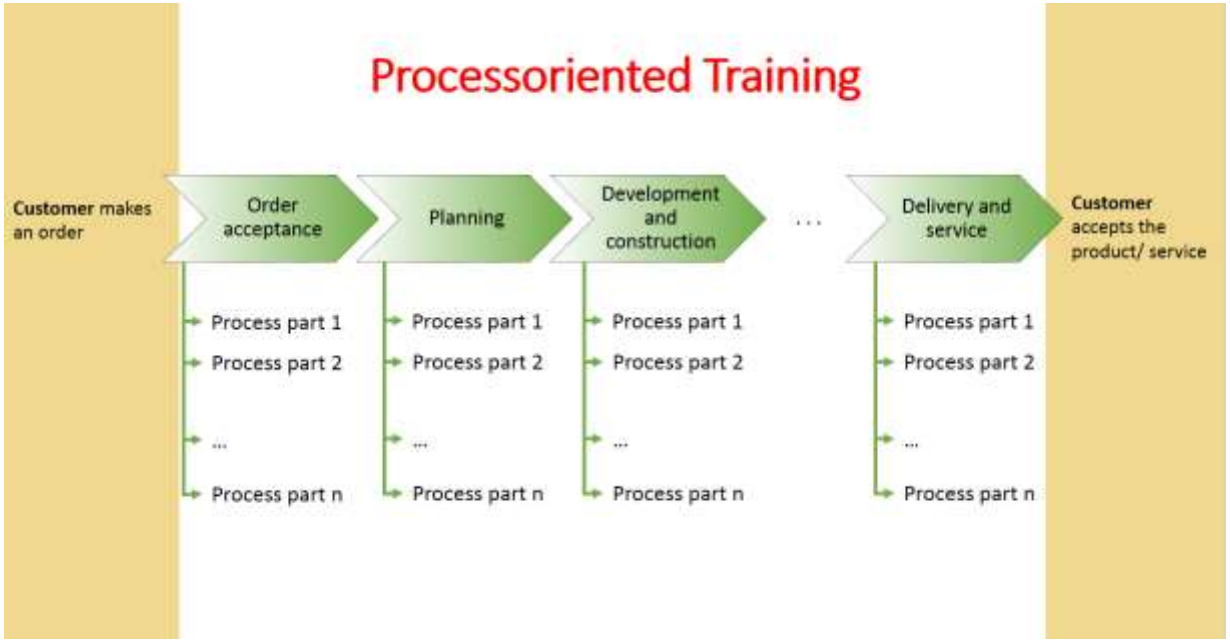
planning, organizing and deciding - one the one hand and productive activities – such as cutting, heat-treating and assembling, for example- on the other hand, modern companies are characterized by flat hierarchies, an increasing shift of responsibility and competence to the level of direct production, and greater involvement of employees in operational planning and change processes. In addition, the work organization is nowadays no longer geared primarily to the technical equipment, but rather to the business process of a company. This shift in paradigm has an immediate impact on the skill profile that trainees need to develop as part of their training.
The company work organization is aligned to the business process of a company. These characteristics directly affect the qualification profile of the skilled worker.

Whereas the mastering of technical systems and machines was regarded as the most important key qualification until the 1990s, comprehensive competence in the field and a keen eye for operational processes and agility in the vocational environment are now in demand.



M1: Processoriented Training

Definitions of terminology

● Business Process Orientation
A business process is the sum of the activities that are performed in a company by different employees or teams in a pre-defined sequence or also in parallel and that contribute to the added value of the company. If vocational training is conceptually and practically geared to business processes and the apprentices are already involved in complex business processes during their training, this is called Business Process Orientation.

● Taylorism
The term "Taylorism" essentially refers to highly standardized work processes, a high

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degree of operational division of labor, a central control of work processes and a clear separation of head and handwork.

● Lean Production

The term "lean production" refers to a production strategy that aims to align all areas of a company so that all forms of wastefulness are largely eliminated from the production process. High-quality products are to be developed, manufactured and distributed with the least possible use of capital, personnel, material and time. Essential features of Lean Production are: just-in-time production, kaizen, Kanban principle as well as the stronger transfer of responsibility to the level of production and thus to the employees of the company

● Just-in-time manufacturing

For just-in-time production, production parts that are manufactured in supplier factories are delivered to customers on time so that they can be directly incorporated into the end products. This eliminates storage and personnel costs for the customers because the storage is transferred to the road.

● Kaizen

The term Kaizen comes from the Japanese and, like term Continuous Improvement Process (CIP), denotes a corporate culture that aims to continuously optimize all operational processes by the employees of a company. The entire workforce is asked to submit suggestions for improvements that help reduce costs or increase productivity.

● Kanban Principle

Kanban is a method of production process control. The processes are based exclusively on the actual use of materials at the point of supply and consumption. Kanban enables a reduction of local stocks of provisioning products. The aim of the Kanban method is to control the value chain at every production stage in a cost-optimal manner. The withdrawals from the respective buffer stores and the replenishment into the same buffer stores take place asynchronously. By distributing the buffer stores in production along the integration chain, a simple solution is achieved by means of information processing and with short transport distances.

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2. Guide to company explorations

Professional actions can be derived from typical occupational work processes of a profession. Occupational work processes usually form a so-called “Complete Act”. The planning, implementation and evaluation of a company exploration is therefore based on the complete action (sse M2).

M2: Complete Action

2.1 Information

2.1.1. Initiating a company exploration

The main aspects of the competence profiles of a profession form the basis of a curriculum. The plans form the basis of the training. To implement the competence profiles into the classroom learning situations, lesson series, lesson modules and much more are developed by the teachers. Modern vocational training is based on examples of occupational tasks and the underlying work and business processes. Detailed work assignments are designed for the students according to the training contents and frameworks described in the curricula. Each school thus develops its "school-based curriculum" via a corresponding selection or combination of appropriate teaching situations (learning situations). This curricular work based on the local demands of the learning environment is often done jointly by colleagues working in the classes of the particular apprenticeship trades.

If this curriculum team is completed by practice teachers (or even employees - trainers - from the companies), operational aspects or practical aspects can be planned already very early.
The practice teachers (employees / trainers from companies) as well as the school teachers are expected to find and formulate suitable work assignments from the medium of the profession, according to the respective occupations and the learning progress of the trainees. This requires creativity and innovation in addition to the existing process and specialist knowledge. Especially with a view to modern techniques and digitization, new learning with media is becoming increasingly more important. This requires revising and adapting tried-and-tested learning concepts, as well as learning from each other and with each other, to develop further in the circle of colleagues or as part of the learning place cooperation.

Quality and success of the training depend on the activities in the classroom AND the practice units. It is therefore all the more important that practice and theory teachers cooperate with one another in the methodological design and didactic preparation of teaching and training.

Curricula certainly contain content and goal formulations that make many colleagues wonder how work and business processes, in which vocational tasks are to be integrated, look in concrete terms in current company practices. The answer to this question involves the initiative to carry out a company exploration. A company exploration allows to learn more about specific operational procedures. In addition, this could give rise to further training cooperations between the school and the company. However, it will certainly not be necessary to carry out a company exploration for each content or goal formulation in the curriculum. But it will become sensible if there is a lack of important information about typical occupational activities and the company's work and business processes.

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The concrete planning and preparation of the company exploration should be carried out by a preparation team. This team assumes all the organizational and coordinating activities that arise in the run-up to a company exploration.

2.1.2 Clarifying aspects of the company exploration and defining goals

At the first meeting of the preparation team the objectives and expectations have to be clarified with which the participants approach the joint project and what in particular they want to explore.

The exploratory focus can be different depending on profession, subject and previous knowledge.

These priorities should be closely related to the general curricula as well as to the school based curricula. These documents form the background against which the preparation team decides what to focus on in the company exploration.

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Possible aspects for company explorations:

• **Professional background of the skilled worker** (tasks and activities, responsibilities, specialist knowledge, occupation-specific / non-professional activities, ...)

• **Typical tasks** (ideas for teaching, project ideas, ...)

• **Competence profiles** (ability to work in a team, ability to communicate, presentation skills, process knowledge, willingness to take responsibility, quality awareness, ...)

• **Business organization** (hierarchy, core processes, support processes, logistics, ...)

• **Education / training department** (approaches to cooperation, connection to the vocational school, ...)

• **Production organization** (group work, independent group work, individual work, assembly line work, semi-autonomous team, ...)

• **Manufacturing processes** (new technologies, e.g. welding techniques, digitization, degree of automation, proportion of manual labor, ...)

• **Changes** (ratio of batch size to degree of automation, ecology, ...)

• A**spects of inter-company cooperation** (representation of interests, health care management, waste management, maintenance, ...)

The compilation of the exploratory aspects provides an overview of possible topics, which should be addressed in the context of a company exploration.

With respect to the exploration aspects the following objectives and expectations can be formulated:

- We recognize the core businesses of the company (products or services).
- We determine the size and importance of the company by the number of employees, area, group, turnover, market shares.
- We recognize the organizational structure or the form of the company (e.g. division-, line-, staff organization or business unit, lean production).
- We recognize the forms of the production process (lot size production or value

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stream principle). We also recognize forms of work organization (individual production, group production, flow production).

- We distinguish the core processes (value-added chain) from the support processes (infrastructure such as energy supply, controlling, occupational safety, environmental aspects) of the company.
- We recognize in the value-added chain the processing steps, the applied standards and methods of quality assurance.
- We recognize the networking and the dependencies of the company on suppliers and customers.
- We learn how the training and the continuing training is organized (e.g. skill requirements, educational priorities, training occupations, number and type of training such as training workshop, qualification centers or accompanying training).
- We recognize the competence profile of the employees, while focusing on the competences that are necessary for the profession.
- We determine the level of qualification of the employees on the basis of statistical data (unskilled workers, skilled workers, technicians, master craftsmen, engineers) - does the activity of a specialist correspond to the occupation learned?
- We learn how the demand for flexibility and continuous further qualification is met in practice.
- We learn how the hiring practices are handled in the company.

2.2 Planning / Deciding

2.2.1 Preparing and organizing company exploration.

Beyond the individual weightings that participants make, the group has a common exploration interest. This is geared to the business process of the respective company as well as to the functions that individual employees and teams perform in the company. The preparation team formulates the objectives of the exploration and compiles the requirements for the companies to be explored.

This selection catalog is the basis for which companies should be approached in order to enable a company exploration. Naturally, companies that are already cooperating and for which personal work contacts have been established are, are especially suitable for company explorations.
If the available information on the companies in question is insufficient and there are no personal contacts, it is advisable to undertake detailed research on the suitability of the establishments. Possible sources are the homepages of companies, their PR departments and information from the associations and chambers.

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On the basis of this preparatory research, the establishment is selected which appears to be particularly suitable for the intended exploration.
Afterwards, the preparation team agrees on how to map out the main steps of the company exploration and what activities are expected by the company in this context.
After a telephone inquiry as to whether there is a willingness on the part of the company to facilitate a company exploration, the further plans are specified via letters or personal calls (*see M3*).

Quelle: https://www.pexels.com/de-de/suche/Industrie%204.0

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M3: Sample letter

Name and address of the school
Name and address of the company

Place and date

Company Exploration

Dear Mrs. / Mr. X,

Thanks again for the friendly and informative phone call last ……

As I already told you by phone, we would like to carry out a company exploration in your company - that is, X teachers from Y school(s). In order to tailor the vocational training to realistic company processes , we are very interested in getting to know the specific operational processes of your company on site. In addition, we would like to get a true picture of the job profile requirements in the "xyz" section.

This would enable us to link the learning tasks more closely to the job requirements than we have been able to do so far.
We would be very grateful if an employee of your company could provide us with some basic information about your company prior to the company exploration and a specialist could be available for questions during the investigation.
The colleagues in charge of the preparation have their next meeting on X-day, the X.X. agreed at X clock. All interested parties from your company are cordially invited to attend this preparatory meeting.

With kind regards

Signature

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2.2.2 Clarifying the exploration process

If the company agrees to carry out the exploration, the organizational framework must be clarified first. Suitable dates must be found, the journey planned, and the course of the exploration outlined (*see M4*). In addition, more precise arrangements with the company in question are necessary, such as:

- Contact person (address, phone, fax, e-mail)
- Objective of the exploration (work processes, procedures ...)
- If necessary, date of a preliminary investigation and coordinating meeting set
- Time and duration of the company exploration
- Meeting point
- Number of persons / group size
- Accompanying personnel, supervisors
- Are discussions with skilled workers in the workplace possible?
- Who is available to us?
- Which information material does the company provide (brochures, website, ...)?
- Meeting rooms
- Technical aids for documentation (camera, video camera, ...)
- Catering facilities
- Directions / Parking
- Safety aspects (clothing, group size, ...

Together with the contact person(s) of the company to be explored, the course of the day is discussed and then specified by the preparation team. Once an agreement on the organizational framework has been reached within the team, appropriate proposals are made to the company. Once the exploration procedure is determined, participants can be invited (*see M5*).

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M4: Planning

Time	Getting there	How (by bus, train or carpool)? Costs?	Who is in charge
	Beginning	Meeting point?	
	Greeting	Who welcomes (Company or School)? Where? How?	
	Presentation of the participants	How? One for all?	
	Presentation of the exploration aspects	Who presents how?	
	Moderator / Speaker	Who moderates ? Who has the word when?	
	Introductory lecture	Theme?	
	Recess regulation (including lunch)	How? Length? Place?	
	Exploration	Which departments? Which area? Who leads through the company? Interlocutor?	
	Interviews	Who interviews whom? Interview questions?	
	Statements / Evaluation	Statements or feedback? Securing the results? Materials? Contact addresses?	
	Documentation	Minutes / Minute takers? Photos? Film / Recordings?	
	End of exploration	When and where?	
	Word of thanks	Who? How? Gifts?	
	Return journey	How (by bus, train or carpool)?	

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M5: Sample letter of invitation with agenda

[Name and address of the school]
[Name and address of the participant]
[Place and date]

Invitation to a company exploration of the company X in Y
Dear Mrs. U / Mr. V,

you are kindly invited to participate in an exploration of the company X (name) in Y (city, exact address) on xx.xx.xx.

The exploration will begin at x o'clock and is expected to end at y o'clock. The exploration team meets at x o’clock at the gate xxx of the company. For any questions, please contact Mr. X/ Mrs Y (Tel .: xxxxx / xx xx xx).

The agenda and detailed directions can be found in the annex attached to this letter.
With kind regards

Signature

Attachments

09.00 Welcome Address
Hr./Fr. X, Production manager (function)

9:20 Introduction to the work and business processes of company X
Hr./Fr. Dipl.-Ing. Y, Head of Management Development

10.30 Recess

10.45 Exploration of the manufacturing process in area X.
Hr./Fr. Z., Head of Department W.

12.15 Lunch together

13.00 Exploration of the company's process chain using the example of X
Interview of individual employees
(If the names and functions of these employees are known, they should be mentioned here)

15.00 Final round
In the conference room of the company

Directions

(text and possibly also map included.)

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As part of the content-related preparation of the company exploration, the information about the operation that has been collected in advance is made available to all participants of the exploration. Based on the exploration priorities questionnaires and observation sheets tailored to the operation are developed.
In addition, participants should familiarize themselves once more with the basics of company organizations as well as with the different production types (*see 1.2*).

2.2.3 Distribution of tasks

Prior to the company exploration it must be clarified in detail who acts as the group spokesman and which colleagues perform which tasks. For the planning of the exploration a To Do List is suitable (*see M6*). If the company informs the preparation team in advance which employees are available for questioning, it can be determined who will conduct the interviews. A camera is helpful for documenting the results.
For photo, film and sound recordings, the approval of the company must always be obtained. Likewise, the personal rights of all parties involved must be preserved in this regard. In most cases, approval will be obtained more easily if the photographs are taken exclusively by employees. If minutes of the employee interviews are taken, ideally several recorders should be named.
To gain as much illustrative material as possible for the development of realistic learning situations, it is necessary that the explorers know the key questions underlying the interviews. The answers should be taken down by previously named participants.

M6: Example of a to-do list for the organization of a company exploration

To	**By when**	**Who**
Formulate questions to the management or the employees	Latest 2 weeks before the exploration	Daniel, Zane, Clara
Write reports on the basis of Observation and interviews	By the time of the evaluation meeting	Aga, Barbara, Daniel, Gerald (takes the minutes)
Compile a photo CD	By the time of the evaluation meeting (if necessary earlier)	Agris
…		
…		

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2.3. Carrying out and evaluating the company exploration

2.3.1 Exploration of work and business processes

The important aspects of the company exploration have already been defined in the preparation (*see 2.1.2*). To be able to effectively contribute the results of the exploration to the curriculum work, the interviews with the employees or the management must be carefully prepared.
We recommend that you use the following key questions when formulating the interview questions. They help to evaluate to what extent observed professional activities are suitable for inclusion in learning situations:

• What role does this professional activity play within the business process of the company?
• Is this professional activity exemplary for the training occupation?

• To what extent is this professional action suitable for the development of a concrete teaching situation / learning situation?
• Which content of the curriculum is primarily addressed in this professional activity?
• Which technical and interdisciplinary competences of the curriculum should be developed further.

• Which aspects of this professional activity are particularly suitable for the development of the above mentioned competences?
• What are the corresponding work orders?
• For which training phase (s) are these work assignments appropriate?
• How much time does it take to complete these work orders?
• What practice oriented teaching methods can be used to complete these work assignments?
• At what point and how can a training section be effectively supported through cooperation with the company?

2.3.2 Possible interview questions

The following list shows examples of interview questions that were formulated taking the exploratory aspects into account. For a better overview and classification, the "sample questions" are subdivided according to individual aspects such as the operating performance, the economic situation or in-company training.

It is neither reasonable nor possible to address all questions during a company exploration. Each exploration group compiles the questions that are relevant to them. The interviews are supported by observation tasks, which are taken over by individual participants and relate to the presented sub-processes.

Interview questions …

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... to explore the **operational performance:**
• Which products are created? Which services are provided?
• How are the production processes organized?
• Which materials and equipment are required primarily?
• What is the degree of automation?
• What are your expectations for the training of professionals?
• To what extent are new technologies involved in manufacturing?
• Have rationalization investments been made in the recent past?
• What key activities are performed within the manufacturing process?
• Which functional relationships exist between the individual production machines and technical systems?
• ...
... to explore the **operational organization:**
• How is the company structured in task areas or departments.
• Which organizational model regulates the cooperation between departments?
• Which strategic decisions are made by the company management, which within the departments?
• To what extent are employees involved in operational decision-making processes?
• How is the company prepared to introduce new technologies, processes or organizational forms?
• ...

... to explore the **economic situation of the company:**
• How many employees does the company have?
• Which competitors are there on the market?
• What is the market position of the company?
• How have the company's sales and profits developed in recent years?
• What is the current order situation?
• Which investments are currently being planned?
• What is the overall development of the industry in which the company operates?
• ...

... to explore mental and social needs in the workplace:

• What typical job-related tasks do you have to fulfill at your workplace?
• Which technical competences and key qualifications do you need for the accomplishment of your professional tasks?
• In what ways has the skill and competence profile necessary for the performance of your tasks changed in recent years?
• Have you participated in training opportunities during your time with the company? If so, on whose initiative?
• How many training days and hours do the company's employees spend on average per year?
• In which direction would you like to develop your career?
• Do you carry out primarily different or constantly recurring activities?
• Who hired you?
• Which steps do you have to take when processing orders?
• How are your responsibilities defined?
• What decision-making powers do you have?

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• How is the contact with the customer organized?
• Which position within the business process of the company do you fill out?
• Do you work mostly alone or in a team?
• With which departments and functionaries do you communicate and cooperate when carrying out your job?
• How does this collaboration work in concrete terms?
• How do you communicate with other employees of the company?
• According to which criteria is your work rewarded?
• What role do occupational health and safety regulations play in your work area?
• What are your expectations for your professional future.

... to explore company training (if available):
• How many apprentices are currently being trained in the company?
• Which occupations can be learned in the company?
• Which of the professions are trained in this company?
• How is the necessity to train in a process-oriented way realized in your company?
• How do you ensure the up-to-datedness of your in-house- training?
• Which methodological innovations have been established in the training?
• How are the contacts with the vocational schools organized that the young people attend?
• Which cooperation or project groups are involved in the design of the training?
• Which professional priorities are dealt with in inter-company training centers?
• How does the company cooperate with these centers?
• To what extent can trainees use the in-company training system?

Further exploration aspects to be considered could be:
• the physical demands in the workplace
• occupational safety
• ecological aspects of business management
• the internal representation of employees' interests

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2.3.3 Evaluating the formulated objectives

After the exploration tour a debriefing on site is recommended. As stated in the invitation (*see M5*), this final round can take place in a conference or meeting room.

This phase of conversation usually has two perspectives:

1. Deepening and clarification of questions that have arisen during the observation process

and

2. Construction / initiation of further cooperations.

In order to be able to compare the expectations with the results as effectively as possible, the final round should be moderated.

The final round …

• offers the opportunity for further queries and to clarify open questions,
• provides the opportunity to discuss individual aspects in more detail,
• serves to introduce further information material on the company (brochures, slide sets, web offers, catalogs),
• brings together training participants from vocational schools and companies to make further arrangements, should this be necessary.
• offers the opportunity to agree on further cooperation activities (further meetings, appointments, establishment of working groups),
• deliberately rounds off the event (words of thanks, summary appraisal, outlook on joint further explorations).

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2.4 Evaluation

2.4.1 Saving and evaluating results

The more detailed the company exploration is documented, the better will be the material that is available to the group for reflection and evaluation.

The results are evaluated and processed with regard to the development of concrete teaching situations (learning situations) at the vocational school. The different personal impressions, the notes of the observers and other materials are presented and evaluated in specially arranged meetings. Because the primary purpose of the company exploration is to (further) develop lessons that allow for complete occupational activity, it is of great interest to filter out exactly these aspects from the present material. Through cooperation and the exchange of experience between the participants, many of the new findings can be incorporated into the training.

This cooperation is important because ...

• in addition to the procedural agreements it will also be possible to come to agreements with regard to temporal and content specific features.

• it provides the possibility to describe the job profiles required for successful work in the profession and in the company and to explain the specifics.

• the importance of occupations can be described based on requirements in the workplace and changes in professional curricula can be incorporated directly into the lessons.
• The development of examples for lessons are not carried out individually.
• The examples of lessons based on the operational reality have to be coordinated even outside of a company exploration.
• The quality of the training can only be guaranteed if the curricula are handled flexibly, cooperatively and imaginatively.
• The role model of such a cooperation has a positive effect on the environment.

2.4.2 Developing a learning situation (practical example)

The success of a company exploration will not least be measured by the impact that the results have on the redesign of classroom processes. The more accurate the preparation of the company exploration, the higher the expected benefit for the classroom will be. Thus, individual occupational activities can be easily worked out into exemplary lessons or a series of lessons. This procedure allows both the specification of the content as well as the methodological-didactic treatment of the observed action.

During a company exploration, which took place to make the content prescribed in the curriculum : "Programming and Realizing Control Systems for installations", the participants became aware of a process that they had developed as an exemplary learning situation. The learning situation for the training occupation "Electronics Technician for Industrial Engineering" is shown in the following table (see M7A). It is an example of a possible procedure and thus to be understood as an exemplary

elaboration and suggestion. The underlying scheme serves to structure and clearly record the learning situation. Now it is still necessary to clarify which of the work assignments are the subject of the lesson and whether some tasks should be carried out in practice units. The coordination, which covers all aspects from the procurement of materials to the the implementation, takes place within the framework of the specialist team.
The practical examples in M7B-M7D show furhter results, refering different professions that were gathered in company explorations during the project-duration. These documentations are based on the same template that can be used for further documentation of learning situations.
The overview covers the profession, the content as well as the instruction (*see M7A-M7D*). To illustrate the context as clearly as possible, a scenario of a complex action is described - from the specification of the order to the execution of the required circuit to the acceptance by the customer.
The scheme represents the learning situation in the form of four work assignments, which are carried out by students. The second column describes the social forms and methods that are helpful in fulfilling the tasks.
To clarify the context in which the required work is related to content, specialist skills are described in great detail, which are achieved / trained when the individual steps are completed.
Finally, the fourth column provides information about which occupational activities are directly related to the fulfillment of these learning tasks.
Such a compilation - applied to all learning situations - can structure the entire curriculum very clearly. In addition, it can be checked whether all desired competencies - both professionally and with regard to the individual steps of action - have been taken into account.

M7A (Darmstadt): Exemplary learning situation for the profession » Electrical/ Electronic technician for industrial engineering «

Profession	**Electrical/ Electronic technician for industrial engineering**
Curriculum / Learning objective	Implement and program the control for engineering systems
Situation of the classroom / the learning situation	Plan, implement and test the complete order processing for the control of a placement system.

Szenario	The company »Greifarm AG« wants to program, install and test the required control system for an existing system. It assigns the order to class XXX and adds the technology scheme as well as further technical data (Attachment: A gripper picks up the individual part of a conveyor belt after a release impulse and thus loads a magazine of 10x8 slots. When the magazine is filled, the full magazine is automatically replaced with an empty one and moved to the home position).

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Work assignment	Methods and classroom formats	Professional (Skill) competence	Operational competence
Check the order and conduct a customer discussion to clarify detailed questions.	Groupwork Informationresearch	Analyze orders. Rate technical details. Prepare customer conversation.	Lead customer conversation. Write a call log.
Create the specifications for this order. Consider which materials are needed and develop a cost and time schedule.	Plan work steps and coordinate the work in the group. Take responsibility for the work processes in the group.	Derive the required materials (sensors, actuators and control) from the functional specification. Recognize the functional context in order to plan the necessary work steps.	Set up work, cost and time schedule. Complete the specification.
Create a technical documentation for the realization of the sales order.	Use of software and hardware. Coordinate the work in the group Clarify responsibilities	Planning of all circuits and development of the entire program. Observe standards and regulations (including the safety regulations).	Create all necessary circuit documents. Provide a program documentation.
Build up the installation and test its function. Pass the installation to the customer.	Apply various documentation procedures. Use presentation techniques. Collaborate in the group Share responsibility for the co-operation between the learning places school and employment.	Ensure the proper installation of the modules. Use tools professionally. Perform functional checks and log	Build, control and evaluate the system. Complete the order. Reflect and evaluate the order processing. Ask for customer satisfaction.

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M7B (Brescia): Exemplary learning situation for the profession » chef «

Profession	**chef**
Curriculum / Learning objective	Prepare menus suitable for the contest, create a menu related to the nutritional needs of the customers.
Situation of the classroom / the learning situation	Plan, implement and test the complete order processing.

Szenario	The company has a contract for a banqueting service in a villa in Franciacorta, near Brescia. The reason is the opening of a new brunch of a company producing natural make-up products. At the event about 100 people are expected, mostly women between 30 and 60. The event is in October and the agreed price is 50 euro for a minimum of 85 guests. The student has to prepare a four courses menu suitable for the event justifying his/her choices. Write all the recipes adapted to 100 people. Order all the necessary stuff. Prepare the list of necessary tools. Estabilish the number of people to form the kitchen brigade.

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M7C (Plock): Exemplary learning situation for the profession: machine tool operator technician

Profession	**machine tool operator technician**
Curriculum / Learning objective	Plan, design, measure and implement a technological process of a ring fixing the basket of the outer
Situation of the classroom / the learning situation	Plan, implement and test the complete order processing.

Szenario	A company “Precizo”, ROLMAR”, “RADPOL”, “FABA” wants a ring fixing the basket of the outer centrifuge. It assigns an order class XXX asking for technology schemes and the whole technological process. It will take 8 hours to make this order.

Work assignment	**Methods and classroom formats**	**Professional (skill) competence**	**Operational competence**
Design a ring	Use software and hardware. Use a manual. Work in a group. Divide the tasks.	Plan the order of the tasks. Analyse the data. Do the necessary calculations. Choose the material.	Analyse the data. Do the necessary calculations. Print out the calculations.
Create technological documentation	Use Solid Edge or another CAM software. Work in a group. Divide the tasks.	Design a layout of the drawing. Draw a ring from different sides.	Draw a ring as **in image 1.** Print out the drawing.
Choose semi-finished products	Use a special table with norms and allowances for the products.	Analyse semi-finished product. Calculate the allowances.	Chose the right semi-finished product - cylindrical rod.
Design the technological process	Use a technological card and a manual card. Work in a group. Divide the tasks.	Plan the order of the tasks and tooling. Choose the right tooling machine. Choose the right handles, devices and tools to do the tooling. Choose the measuring tools. Calculate the time for each operation of the tooling process.	Complete all the necessary documents: technological card and a manual card.
Write a programme for a CNC machine tool	Use a CAM program or write a program in ISO. Work in a group.	Choose the system of coordinates.	Write a program. Simulate and control the process.

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	Divide the tasks.	Write down the data according to the manual card.	Do the necessary changes in the process.
Do the tooling on a CNC machine tool	Use a CNC machine tool to do the tooling. Work in a group. Divide the tasks.	Install the cylindrical rod. Copy the program to the CNC machine tool. Do the tooling. Observe the tooling.	Do the tooling. Do the necessary changes in the process.
Do various measurements of the ring	Use measuring tools like caliper, micrometer, diameter. Use coarseness meter to check the coarseness of the surface.	Measure the diameters. Measure the coarseness of the surface.	Control the measurements. Control the coarseness of the surface.

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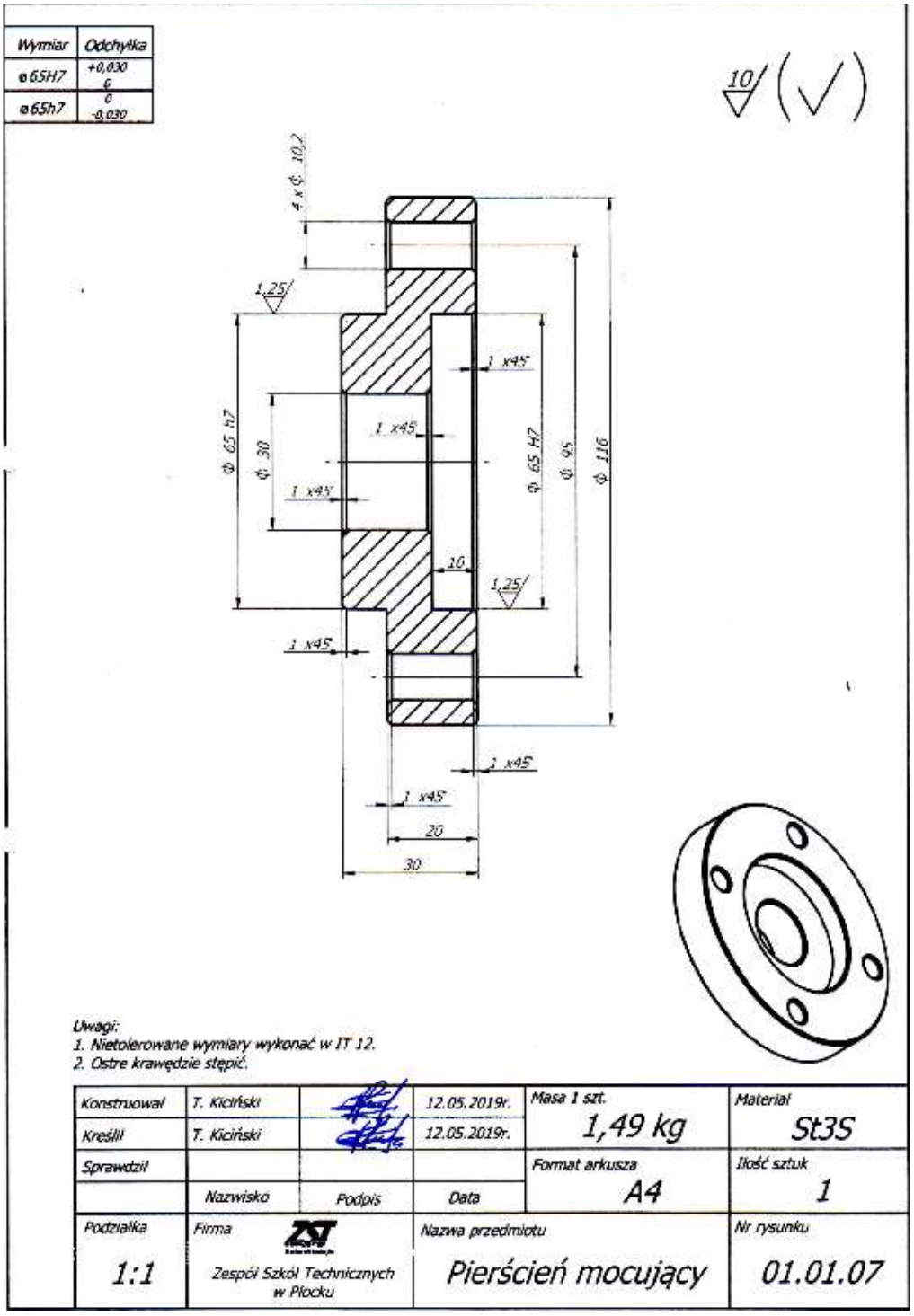
Evaluation

In the evaluation stage the following aspects should be considered:

- Was the ring properly designed?
- Was the technological process prepared properly?
- Is the technological documentation completed?
- Is the final product tooled as it was desired?
- Does it have the right shape and coarseness?

Image 1



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M7D (Liepaja): Exemplary learning situation for the profession »tailor/stylist«

Profession	**tailor/ stylist**
Curriculum / Learning objective	Fulfill an order of 25 uniforms for pre-school students.
Situation of the classroom / the learning situation	plan, implement and produce the complete order.

Szenario	The kindergarten “Pīpenīte” needs 25 pcs of uniforms for their dance group performance at the City Festival. It assigns the order to class XXX and adds the technical design of the outfit and fix a date for the group to come to the kindergarten to take the mesurments of the students. The students have to take the mesuraments for preparing the cutout for each pre-school student, construct a pattern, create a template, cut out template of the fabric, process the seems, make an individual fitting, finish the product.

Work assignment	**Methods and classroom formats**	**Professional (skill) competence**	**Operational competence**
Check the order and conduct a customer discussion to clarify detailed questions and needs.	Groupwork, idividual work.	Analyze the order. Prepare customer conversation.	Lead customer conversation.
Take the mesurments of the students, construct a pattern and create a template.	Plan work steps. Take responsibility for individual work process.	Make a pattern, plan the necessary work steps for the sewing operation.	Work with a client. Apply theoretical knowladge in practice.
Cut out template, tack it for the individual fitting.	Individual work.	Use of cutting and sewing machines.	Work with a client.
Finish the product, test its functions. Pass it to the customer.	Use presentation techniques. Collaborate in the group. Share responsibility for the co-operation between the school and the employment.	Use tools professionally. Quality examination.	Complete the order. Reflect and evaluate the order processing. Ask for customer satisfaction.

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2.4.3 Evaluation of the exploration

In the evaluation of the exploration the following aspects should be considered (see M8, M9):

- Organization of the event
- Content yield (in terms of the formulated goals)
- Evaluation of the overall process
- Quality of the results
- Transferability to classroom teaching and in-company training
- Role of the cooperating partners in organization and implementation
- Mood, atmosphere, group climate
- Effectiveness (on theoretical school instruction / training, students / trainees)

For future company explorations, the following comparison is appropriate:

M8: Take stock to prepare further explorations

What has been positive?	What has not worked out?

Company explorations are an important tool to ensure the quality and flexibility of training. Both teachers and trainers need the example of concrete operational processes to be able to formulate tailor-made teaching situations or tasks.

In this sense, company explorations should be regarded as an integral part of the curriculum work and should be carried out regularly.

The reflection of the results is the basis for further planning:

- What can be improved next time?
- Changes in the concept of training planning?
- What changes or corrections can be made in the future?
- What conclusions can be drawn from the evaluation of the events?
- Which next steps can be derived from the exploration?
- How are the results communicated?

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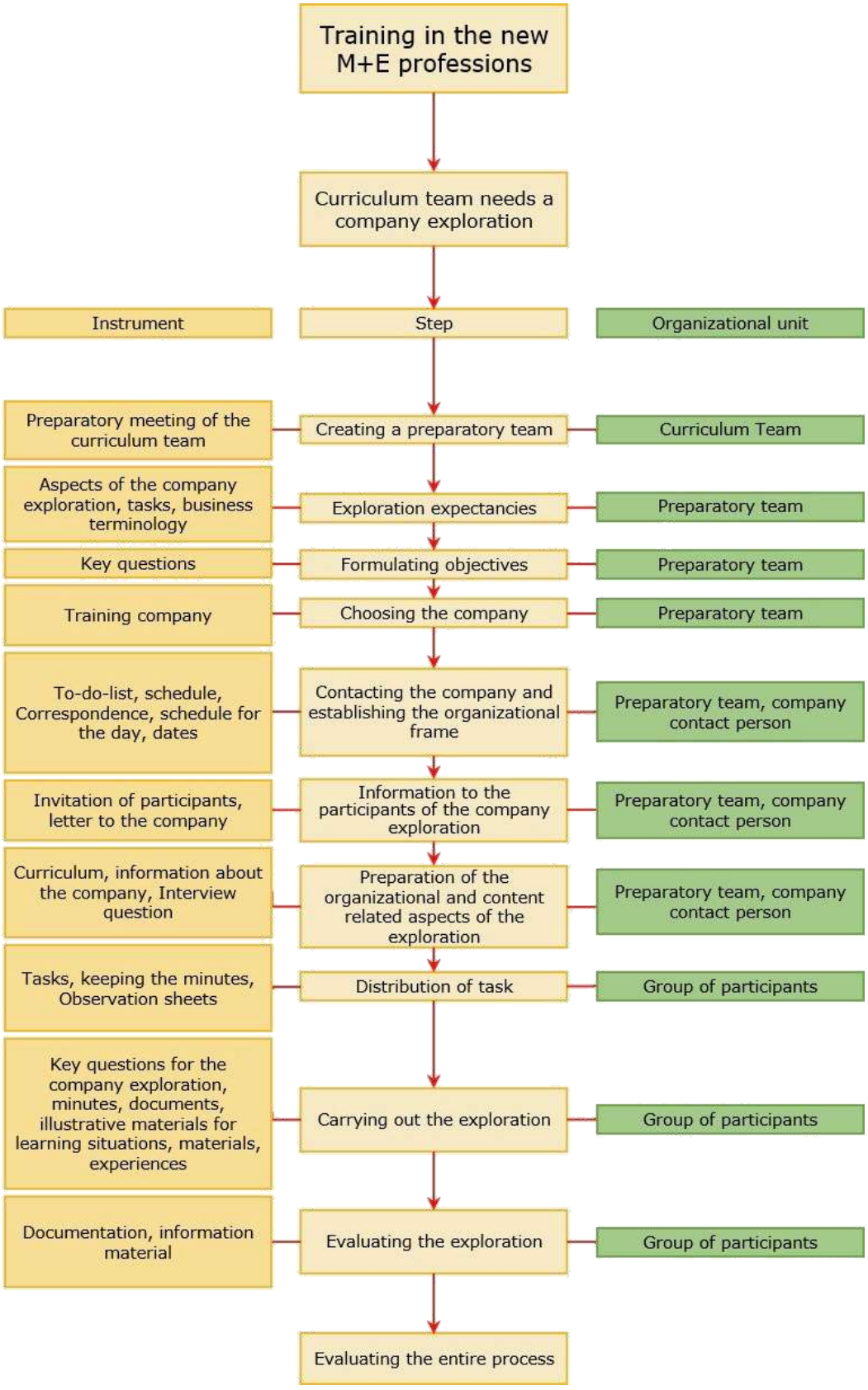
M9: Schematic example of the processes involved in a company exploration



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3. Notes and information

3.1. Partners

Coordinator

Heinrich-Emanuel-Merck-Schule

Alsfelder Strasse 23
64289
Darmstadt
HESSEN
http://www.hems.de
Organisation type: School/Institute/Educational centre – Vocational Training (secondary level)

Partners

Istituto di Istruzione Superiore di Stato "Andrea Mantegna"

Via Fura 96
25125
Brescia
Lombardia
http://www.istitutomantegna.gov.it
Organisation type: School/Institute/Educational centre – Vocational Training (secondary level)

Zespol Szkol Technicznych w Plocku

Al.Kilinskiego 4
09-402
PLOCK
http://www.zstplock.pl
Organisation type: School/Institute/Educational centre – Vocational Training (secondary level)

PIKC "Liepajas Valsts tehnikums"

Ventspils 51
LV 3405
Liepaja
Kurzeme
http://www.lvt.lv
Organisation type: School/Institute/Educational centre – Vocational Training (secondary level)

Industrie- und Handelskammer Darmstadt Rhein Main Neckar

Rheinstraße 89
64295
Darmstadt
HESSEN
http://www.darmstadt.ihk.de
Organisation type: Regional Public body

Merck KGaA

Frankfrurter Straße 250
64293
Darmstadt
HESSEN
http://www.merck.de
Organisation type: Large enterprise

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3.2. The project „Motivating young Europeans"

Within the scope of the project „Moving Young Europeans", several vocational schools from Liepaja/Latvia, Płock/Poland, Brescia/Italy, and Darmstadt/Germany have united with the industrial company and recognized training firm Merck KGaA and the Chamber of Industry and Commerce Darmstadt Rhein-Main, in order to exploit various forms of learning cooperation and to form a sustainable European network of vocational education and training that offers learning stays for apprentices abroad in the professional fields of IT, electrical engineering, mechatronics, metal industry, gastronomy and automobile engineering in the context of a EU Twin Town Partnership.

Our project takes up the growing internationalization of business and the increase of mobility hence necessary among youth in their first vocational training. Based on a workshop on the subject of "Youth unemployment and shortage in skilled workers" at the Chamber of Industry and Commerce (IHK) in Darmstadt in February 2015, the institutions filing the application have dealt with the measure of a "cooperation between learning places". The workshop was carried out within the context of the EU-network among twin towns. The working results of the actors (vocational schools, IHK, enterprise Merck KGaA) defined the building-up and cultivation of a "learning place cooperation" as an effective and strategic measure for increasing the employment of young people in Europe. The cooperation between learning places means the collaboration of vocational schools and recognized training firms, resp. cooperating companies. It does not only refer to the dual system of education but describes all forms of vocational training, even full-time schools, where cooperation between different learning places for optimizing the vocational education takes place.

The Chamber of Industry and Commerce and also the company Merck KG a.A. maintain contacts to other companies at home and abroad. Regarding the cooperation between learning places, they see things representatively in the perspective of the companies, whilst the schools are co-determining the subject from their own perspective. Both the IHK and Merck KGaA will also assist in the mediation of posts for a learning stay. At the same time, they may also act, due to their strong regional position, as a door opener to other companies that support the schools in advertising activities in their media and offer local and international information events on the subject of learning stays and their added value for both the training and the firms.

The intention is to integrate the European idea of unity into the vocational training, to qualify the apprentices for fulfilling the tasks in the profession, and for participating in the world of works, society and Europe in a social and ecological responsibility. That is why well-tried procedures of good practice in the learning place cooperation are exchanged, further developed, and tried out.

Fundamental structures for a readiness and openness for such goals are the centre of

attention for the working mission of this partnership. This shall be achieved in detail by the following aspects of the cooperation between learning places:
1) organization, tasks and management of the vocational training network
2) planning, realization and evaluation of cooperative training projects with a focus on functional learning, including web based learning (e-learning, digitalization 4.0)
3) planning, realisation and feedback to investigations of companies for generating vocational learning assignments, and
4) transnational cooperation regarding vocational learning stays abroad.
Based on these first topics of a cooperation between learning places, the following partial goals are resulting:

Goal 1) To form a transnational network of vocational training that enables learning stays abroad for apprentices.
Goal 2) With the help of cooperative training projects some self-organized, functional teaching forms and concepts of web based learning will be exchanged.
Goal 3) A guide for the preparation, realization and feedback to company investigations will be drawn-up, tested and evaluated.
Goal 4) An accurately fitting vocational and intercultural motivation training for learning stays abroad will be developed, tested and evaluated. For this purpose, some learning stays will be made possible during the project term.

The status of the formulation and further information may be held anytime of the project partners or the institution filing the application, i.e. Heinrich-Emanuel-Merck-Schule. The mailing address is: Gerald.Hubacek@darmstadt.de . The project group is reporting on the progress and the results of the partnership under the following website: www.erasmusplus-project.eu .

3.3 Qualification Network Erasmus+ "Motivating young Europeans"

The success of this vocational training project can already be seen in the fact that it brings together so much European competence and motivation for a common Europe.

Important institutions are committed to motivating young Europeans to learn and train abroad:

- Vocational training is represented by very committed vocational schools from Liepaja, Plock, Brescia and Darmstadt, which are working on a Europe for the people.
- The Technical University of Darmstadt is the scientific cooperation partner.
- The business community is represented by the Darmstadt Chamber of Industry and Commerce, the company Merck KG a.A. and many other companies and chambers in the partner cities.
- Politiy support the project through the network of European partner cities with their intercultural offices.

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The project has succeeded in starting cooperation between these different institutions in order to get involved in vocational training.

Further development of vocational education and training is thus at the center of the project and stimulates new aspects of the European partnership and the European concept of unity.

Cooperating municipalities, scientific and vocational institutions

Brescia	Darmstadt	Liepaja	Plock
Instituto di Istruzione Superiore di Stato „Andrea Mantegna“	Heinrich-Emanuel-Merck-Schule	PIKC Liepajas Valsts Tehnikums	Zespol Szkol Technicznych

IHK Darmstadt Rhein Main Neckar

MERCK

TECHNISCHE UNIVERSITÄT DARMSTADT

Cooperating institutions and companies

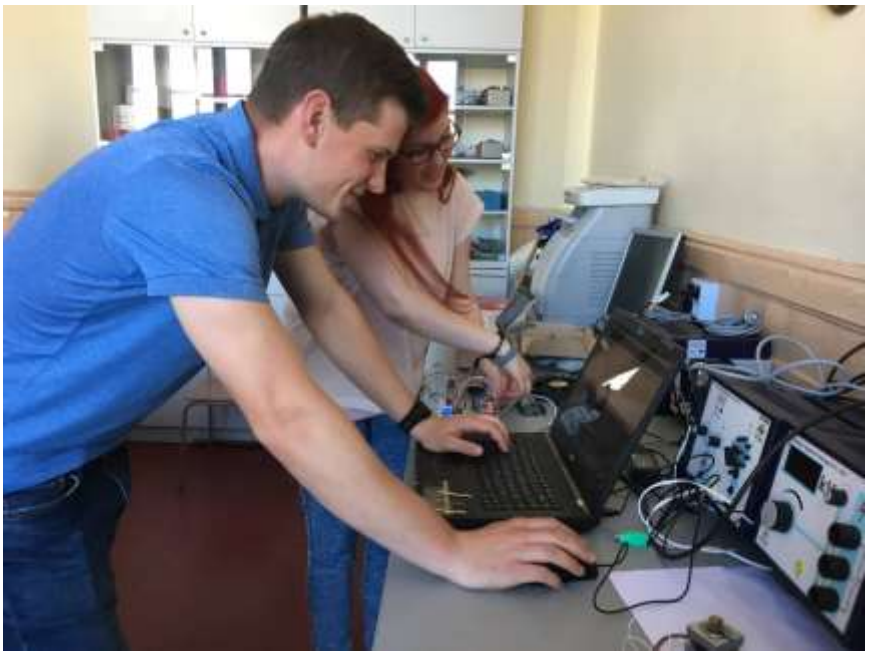
- AE Partner (Liepaja, Latvia)
- AMZ - KUTNO S.A. (Kutno, Poland)
- API Industria (Brescia, Italy)
- Barone Pizzini (Brescia, Italy)
- Best Western Hotels (Darmstadt, Germany)
- Blue Shock Race (Liepaja, Latvia)
- Centromost Stocznia Rzeczna w Plocku (Plock, Poland)
- Coop. Tempo Libero (Brescia, Italy)

- Copan Group (Brescia, Italy)
- Cukrownia Dobrzelin S.A. (Plock, Poland)
- FABA S.A. in Baboszewo (Baboszewo, Poland)
- Intercultural Training Berlin (Berlin, Germany)
- Liceum Ogolnokształcace im. Marsz. St. Malachowskiego (Plock, Poland)
- Liepaja Special Economic Zone (Liepaja, Latvia)
- Mg.softech (Darmstadt, Germany)
- OMR Automotive (Brescia, Italy)
- Palazzoli spa (Brescia, Italy)
- Panstwowa Wyzsza Szkola Zawodowa w Plocku (Plock, Poland)
- Panstwowa Wyzsza Szkola Zawodowa w Plocku (Plock, Poland)
- Rejs Company in Rypin (Rypin, Poland)
- Santoni S.p.A. (Brescia, Italy)
- SIA "BSR Liepaja" (Liepaja, Latvia)
- SIA "Expedit Baltic" (Liepaja, Latvia)
- TU Darmstadt (Darmstadt, Germany)
- Urzad Miasta Plocka (Plock, Poland)
- Zespol Szkol Ekonomiczo-Kupieckich (Plock, Poland)
- Zespol Szkol Technicznych w Plocku (Plock, Poland)

3.4 References

This brochure is based on the experiences and materials that were created during the project “Motivating young Europeans”, the M+E Qualifizierungsnetzwerk (MEQ) project-group and company explorations in the companies mentioned in chapter 3.3.

We thank the project members for making the pictures and the clearance to use them in this guide. Other pictures were taken from the stock photo platform www.pexels.com – the pictures are under free licence.



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HEMS Darmstadt

ZST Siedemdziesiątka

IHK Darmstadt Rhein Main Neckar

MERCK