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Methodology for the use and creation of customized concept maps

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**Young people in the company - concept maps in
intercultural work teams,**

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Home

The presented methodology is one of the outputs of the Erasmus + project, reg. no. 2022-3-CZ01-KA210-YOU-000102278 "Youth Work - Concept Maps in Intercultural Work Teams", whose main objective is to create concept maps of professional terms in Czech-Slovak-Ukrainian-German-French-English version to support the inclusion of young foreigners in intercultural work teams of industrial enterprises.

The Erasmus+ project "Youth Work - Concept Maps in Intercultural Work Teams", reg. no. 2022-3-CZ01-KA210-YOU-000102278 deals with the possibilities for industrial companies in the Czech and Slovak Republic to support the integration of young foreigners into intercultural work teams through the use of concept maps from the following fields: quality management, production management, human resources and logistics, plastics, mechanical engineering, electrical engineering and IT. The methodology of using conceptual maps is intended for users of conceptual maps who work with young foreigners in the context of their integration into society and primarily facilitates the process of integrating young foreigners into multicultural work teams, and the methodology of creating tailor-made conceptual maps enables the extension of the given fields to other sectors that foreigners may encounter on the labour market.

The aim of this project is therefore to support the employability of young, especially low-skilled employees with a different mother tongue, who currently form a significant group of potential employees for vacancies in industrial enterprises. By improving mutual communication skills and language skills through the creation of concept maps focusing on individual areas of company processes and the expertise of the company's production programme, we will achieve an increase in the employment of young foreigners, their faster integration into work teams and thus promote the principles of democracy and the integration of young employees with a different mother tongue into European democratic society, which is one of the main themes of our project.

The beneficiary of the project is the Czech educational agency LASERneedle CZ s.r.o. and the partner is the Slovak educational agency Topcoach s.r.o.



1 Methodology for using concept maps

Concept maps are an effective tool for visualizing and understanding complex processes, especially in education and industry. This guide provides guidance on how to work with them in a variety of settings, from industrial enterprises to career guidance. The aim is to improve communication, facilitate the involvement of young people in work teams and promote their integration.

The handbook is intended for labour market professionals, educators, HR managers and others who want to use this modern tool effectively. In the following chapters you will find procedures, recommendations and practical examples on how to create and implement concept maps.

Concept maps are designed to provide users with an overview of a specific issue. Their use depends on the nature of the organisation and the target group it is working with. Each entity can adapt the maps to its own needs, making them a versatile tool.

In this chapter, we focus on specific approaches for different types of organizations. The aim is to offer a structured and clear view of how they can be applied in practice.

The goals and procedures for using concept maps logically depend on who is working with them. This may include industrial enterprises, employment offices, employment agencies, secondary schools, career guidance organisations and other labour market actors.

The concept maps are designed to serve different actors in the labour market, such as industrial enterprises, employment agencies, employment agencies, secondary schools or career guidance organisations. The objectives and procedures for their use are adapted to the specific needs of the user.

This methodology allows for the effective use of concept maps as a practical tool for promoting the employability of young people and increasing labour market inclusion.



1.1 The use of concept maps in an industrial enterprise

Concept maps help industrial companies effectively manage production processes, logistics and other key areas. They enable employees to quickly understand workflows and reduce the risk of errors caused by misunderstandings. For example, in quality, maps can show inspection procedures and standards that must be followed.

In addition, they facilitate the involvement of new staff, especially those from different cultural backgrounds. This gives young people and foreigners a better overview of their tasks, which increases their self-confidence and effectiveness. Concept maps also promote teamwork and improve communication between departments.

Industry-focused concept maps that include the linguistic mutations of the nationalities present among the company's employees could be used by industrial companies on three levels.

- Concept maps can form a content component of leadership training, especially for first-line managers who also work with lowskilled workers. This training could be delivered in both face-to-face and online formats.
- Concept maps can be incorporated into team building activities to promote team spirit in specific multicultural work teams.
- Concept maps can also be applied in the adaptation phase of new foreign employees. They can be provided to new employees for self-study or can be prepared directly at the employee's workstation in various forms.

The effectiveness of the above use of concept maps will be enhanced if the enterprise creates them on a bespoke basis.



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1.2 The use of concept maps in labour offices

One of the legal rights of a jobseeker is job placement in the sense of finding suitable employment, counselling and providing information about job opportunities. However, job seekers often have distorted ideas about the specifics of individual positions in industrial enterprises, and greater or lesser ignorance is also a limitation to the provision of quality advice by UO staff. Working with concept maps is a suitable solution.

Employment offices can distribute the tailor-made concept maps to job seekers. This can give them a better understanding of the structure of the enterprise and its production. The concept maps will certainly include the names of products and special production processes. The language versions of the cards will also give them an idea of the multicultural environment.

In the context of the recruitment process, the fact that the employee has learnt some of the concepts beforehand could be indicative of motivation to accept the position and will also facilitate the adaptation phase after starting the new job.



1.3 The use of concept maps in employment agencies

Employment agencies can use the maps for recruitment, training and management of workers. Concept maps visualize employer requirements and help workers better understand work procedures or safety rules. For temporary workers, for example, a map can show all the steps from registration to termination.

This approach reduces administrative complexity and improves the efficiency of communication between the agency, the employer and the workers. Especially for young candidates, such visualisation is very useful when adapting to a new environment.

The use of concept maps can also incorporate agreements between the company and the employment agencies that recruit the employees.

Already today, companies have some special disposition requirements for certain positions, the level of which is verified by the employment agencies. Knowledge of selected concepts from the concept maps could test the willingness to learn new ones, which is essential for successful mastery of work activities.

However, in addition to personality traits, employment agencies can also use the concept maps as an indicative diagnostic tool to identify dispositions. By observing the orientation of the concept map in the relevant language, it is possible to detect, for example, the functional illiteracy of the applicant, his/her level of flexibility of thinking and, in general, the dispositions needed to enter a multicultural corporate environment.



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1.4 The use of concept maps at secondary and secondary schools

Secondary schools and vocational schools can use concept maps in career guidance (see next section 1.5) to show students in their final year what opportunities are available to them on the labour market. This helps them to better prepare for their future occupation and to choose a specialisation.

For general secondary schools and non-technical secondary schools, it is possible to integrate work with concept maps of enterprises into subjects such as the basics of social sciences, economics, etc. Thematically, it corresponds to the areas of 'Man and society' and 'Man and the world of work'. As an example, we present the links with the expected outcomes of both of these educational areas in the framework curriculum for secondary schools.

In addition to the above, secondary industrial schools and technical vocational schools may use concept maps to enrich general language education (English, German, French, Russian....) or include an optional subject of vocational language training.

In engineering, maps can be used to explain more complex manufacturing processes or mechanical systems. Selected concept maps can be directly incorporated into the content of some technical subjects in order to link theory and practice. This possibility is also supported by the example of vocational competences for secondary vocational education in engineering, from which the following example is taken:

Schools can therefore use concept maps to help them better understand the curriculum. The maps make it easier for students to grasp key concepts and the relationships between them.



1.5 The use of concept maps in career counselling

Concept maps can also be functionally applied in career counselling.

In primary and secondary schools, they are systematically provided by educational counsellors and externally by specific organisations, e.g. Infocareer. The usefulness of concept maps lies primarily in the fact that they include the names of business processes and activities as well as specific communication codes of the field, from which many contexts can be guessed, e.g. the relation of the field to a specific legal regulation, etc. Primary and secondary school students can thus get a more realistic idea of the wide range of job opportunities in an industrial enterprise, also in the context of in-house career development. Usually, pupils' and students' perceptions of the operation of an industrial enterprise and the job roles are highly distorted.

For example, based on a qualitative survey in primary schools in the Pilsen region, it was found that pupils in the 8th and 9th grades have the idea that there are only four types of jobs in an industrial enterprise:

- manual work (purely manual work, manual work at the machine)
- computer work (unspecified computer work, IT)
- Management (various degrees)
- development (highly creative technical professions)

Another, not entirely true, idea is that only a technical education leads to a job in an industrial enterprise. Inquiries about the job description of specific positions revealed an even greater departure from reality.

The conceptual maps also show the nature of the multicultural environment in contemporary industrial enterprises, which in the Czech Republic is further supported by the majority ownership of enterprises.



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Concept maps can be used in career counselling in primary and secondary schools through various forms:

- as a lecture by an educational/career counsellor,
- as a cross-cutting project theme,
- within the topics of career orientation and vocation in the subjects of civic education, health education, English or German language, etc,
- cards engineering, electrical engineering, computer science in the subjects of computer science, physics, technology and others,
- in cooperation with the Infocarrier

In career counselling, concept maps are an invaluable tool for displaying career growth opportunities. Counsellors can use them to present different career paths, the necessary skills and processes to achieve their goals.

For young applicants and foreigners, the maps are very useful in understanding local working conditions, retraining opportunities and integration programmes. They help them to better plan their careers and get an overview of market requirements.



2 Methodology for creating customized concept maps

The methodology of creating customized concept maps includes schematic and descriptive parts. The flowchart shows the sequence of steps in the creation of a concept map, while the verbal description specifies and justifies each step.

The main steps in creating customized concept maps are as follows:

1. Defining the target group and objectives:

First, it is necessary to determine whether the map's objective is to support the adaptation of employees, training or career guidance.

2. Preparation or customisation of map content:

The content should focus on specific needs, e.g. industry processes, company culture, working conditions or soft skills.

3. Translation and localization:

Subsequently, it is necessary to ensure the availability of maps in language versions suitable for users at the specific workplace, here translated into the languages used at that time at the workplace, including their adaptation to the cultural and professional specifics of the target group.

4. Implementation:

Educational institutions can use them in teaching.

Companies can use them to train new employees or as a tool to improve communication in multicultural teams.

Career counsellors can involve them in individual career planning.

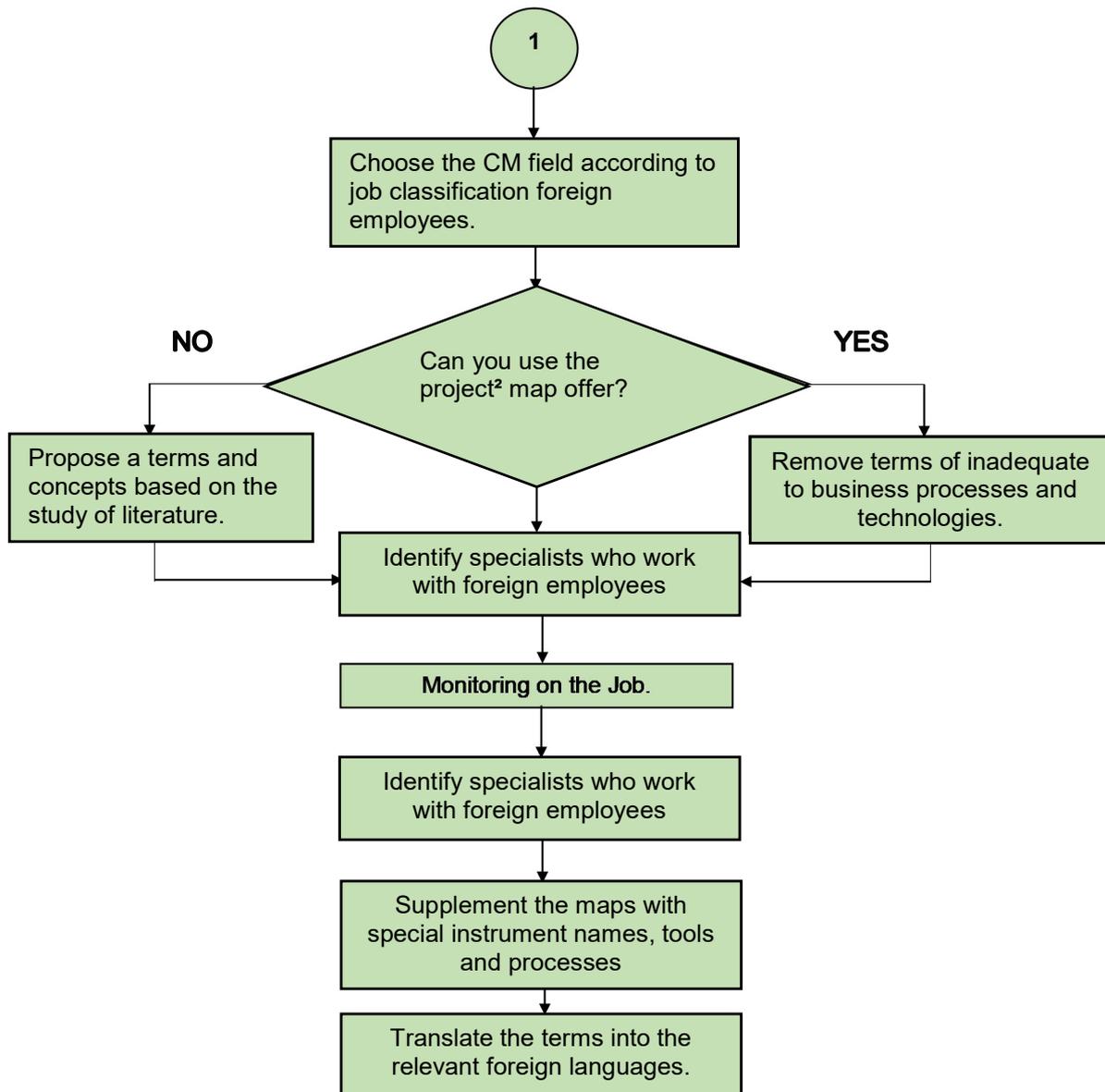
5. Evaluation of benefits:

Finally, feedback from users needs to be recorded and the impact on improving integration, learning or work performance needs to be determined.



2.1 Flowchart for creating a customized concept map (CM)

The process includes stages from information gathering through analysis to the creation of a visual map. The first step is to identify the key concepts and their relationships according to the diagram. This is followed by a proposal to use software that enables the map to be produced in high visual quality.



¹ The need to create a concept map

² Human Resources, Logistics, Quality Management, Process Control, Plastics, Electrical Engineering, Mechanical Engineering, Information Technology



2.2 A verbal description of creating a customized concept map

The creation of a concept map starts with defining the goal that the map is to achieve. For example, it may be to train new employees or to present company processes. Next, the key concepts to be represented by the map and the relationships between them are identified.

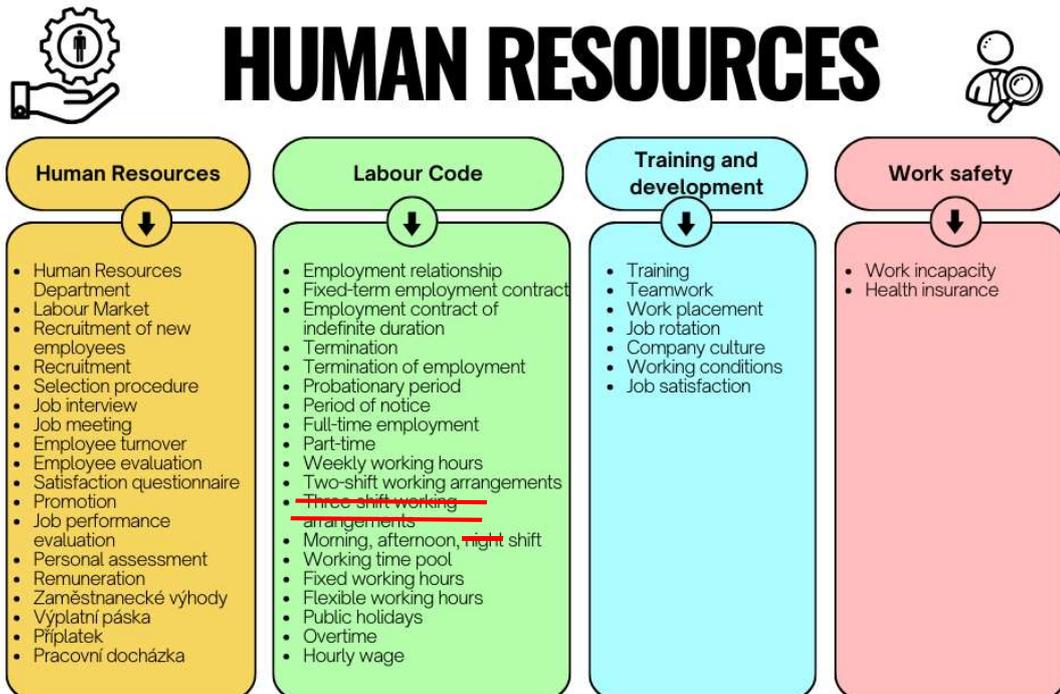
Then it is important to determine the graphical form of the map - whether it will have a hierarchical structure, a grid form, or another type. The resulting map is tested on a sample group of users and adjusted according to their feedback to make it as effective as possible.

The following describes the creation of a customized concept map in sequential steps.

1. First of all, based on monitoring of the current or estimated future employment of foreign employees, it is necessary to select the field that the company needs to process into a concept map. It is possible to use a range of fields that have already been processed within the project.
 - HR
 - Logistics
 - Quality management
 - Process management
 - Plastics
 - Electrical Engineering
 - Engineering
 - Information Technology
2. If the offer corresponds to the needs of the company, can be based directly on a specific concept map. The maps created can be found in chapter 3 and are freely available on the project website <http://www.laserneedle.cz/erasmus-102278>.



3. In the next phase, it is necessary to delete concepts that do not relate to the operation of the business and do not correspond to business processes.



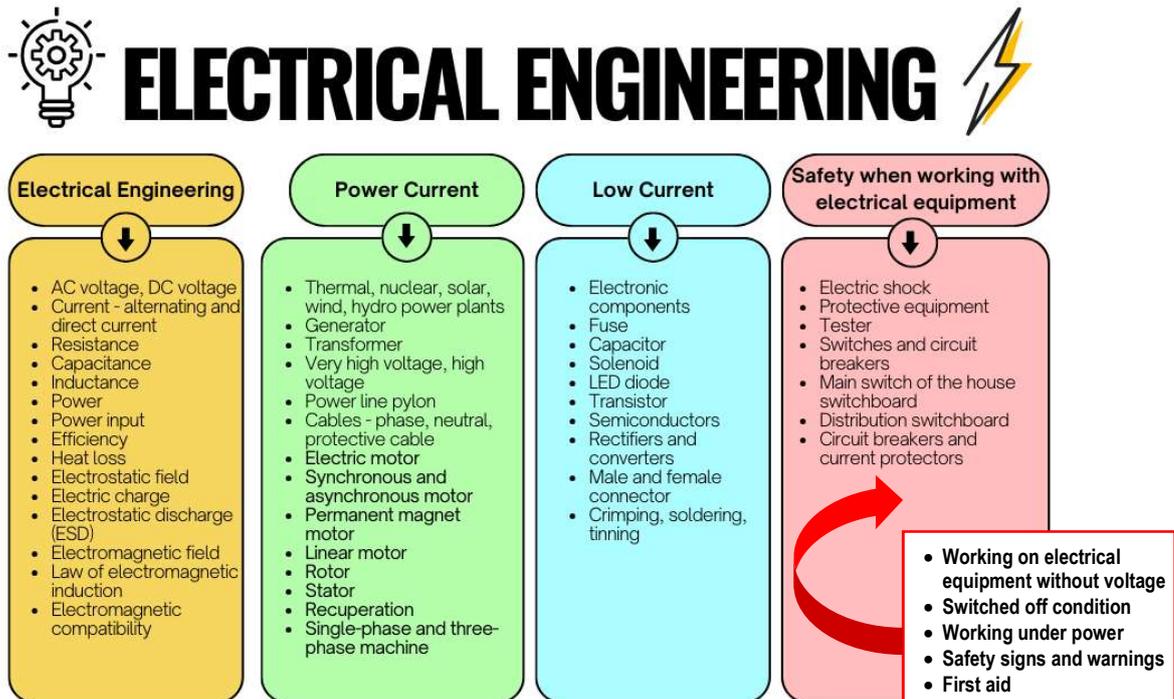
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Illustrative example of the removing of specific terms

4. This step should be requested from employees who hold the relevant professional position in the company and who are in frequent contact with foreign employees. For a certain period of time, at least two working days, they should take note of the communication content and specific terms they use when interacting with these workers. We recommend that time be devoted to this analysis, even though many may assume that they remember frequently used terms. There are always some left out. On the basis of the findings in this way, the concept map will be supplemented with frequently used terms.



5. In some cases, or in some fields, it is important to supplement the concept map with special names for production equipment, tools and technological processes. An example can be found in the following figure.



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Illustrative example of the addition of specific terms

6. Subsequently, the concept map will be translated into the languages of the nationalities of the employees in the respective job classification. For Cyrillic, we also recommend a phonetic record.
7. Finally, the creator of the concept map must decide how the concept map will be used. This means answering the following questions:
- Who will use the concept map, only foreigners or their superiors and co-workers?
 - Will employees memorize the concept map or not?
 - Will employees use the online app, the downloaded file on their mobile phone, or the printed version?
 - Do they have seamless access to mobile and internet at work?



2.3 Selecting tools for graphic editing

For the graphical processing of concept maps, it is crucial to use software that allows intuitive creation and easy editing. Here are some recommended tools:

1. Microsoft Visio

Ideal for professional graphical processing of process diagrams and concept maps. It offers many templates and customizable features. The advantage is the ability to export to different formats (PDF, PNG, etc.).

2. Lucidchart

Online diagramming tool, accessible from any device. It allows real-time collaboration, which is suitable for teams. Supports integration with Google Workspace.

3. Canva

An easy-to-use platform for graphic design. It offers a wide range of templates and the ability to create simple concept maps. Suitable for fast visual processing. The advantage is the possibility to export to different formats (PDF, PNG, PPT, etc.).

4. Coggle

Specialized tool for creating concept maps. Allows simple addition of concepts and relationships between them. Ideal for smaller projects.

5. MindMeister

Excellent tool for mind and concept maps. Supports collaboration and sharing of maps in a team. Allows you to export maps to different formats.

6. Draw.io (Diagrams.net)

A free tool with a wide range of customization options. Ideal for creating basic maps and diagrams. Allows offline and online work.

Each of these tools has its own benefits depending on the specific needs of the team or organization. We used Canva to develop our concept maps.



2.4 A selection of tools for language practice

Concept maps can be easily integrated into e-learning courses. Participants can first study the printed or digital maps and then test their knowledge in practice forms. For practicing, we have chosen a clear spreadsheet of concepts and online practice in Google Forms, where concepts can be practiced by translating them from the native language into English. In addition to Google Forms, other tools that provide interactive and clear ways of learning can also be used to practice technical concepts in foreign languages. Here are the recommended options:

Google Forms - Allows you to create tests and questionnaires, including integration with Google Classroom.

Quizlet - Allows you to create your own digital flashcards and share them. Students can practice concepts with games, quizzes and customized activities. Suitable for technical terms with translations.

Kahoot! - Interactive platform for creating quizzes and tests. It supports gamification of learning and is ideal for group learning and self-study.

Anki - Learning software based on spaced repetition. Effective for long-term memorization of concepts in different languages.

Microsoft Forms - An alternative to Google Forms, allows the creation of tests and questionnaires, including integration with Microsoft Teams.

Memrise - Specializes in language education, offering interactive lessons and the ability to create your own exercises.

Socrative - Allows you to create and share quizzes and quick practice of terms in real time.

Each of these tools offers flexibility and the possibility of customisation for specific learning needs. This comprehensive approach ensures that participants not only become familiar with the technical terminology, but also learn it practically. Combined with modern tools and e-learning, the maps are an effective way to develop the competencies of workers in the industries.



3 Young people in the company - concept maps in intercultural work teams

The main reason for creating concept maps is to simplify the adaptation of new employees, especially young foreigners who may not have a perfect command of the language or technical terms. Concept maps serve as a clear and visually appealing tool that links individual processes and concepts. They enable a quick understanding of the context and facilitate communication in the workplace. In the framework of this ERASMUS+ project Youth Work - Concept Maps in Intercultural Work Teams, Reg. No. 2022-3-CZ01-KA210-YOU-000102278, new concept maps were developed based on a needs analysis of companies in the following key areas. Thanks to cooperation with Czech and Slovak partners, they have been translated into English, German, French and Ukrainian, which facilitates the integration of young employees with different language backgrounds into Czech and Slovak work teams.

The generation of concept maps from areas such as quality management, production, HR, logistics, plastics, mechanical engineering, electrical engineering and IT is based on an analysis of the needs of industrial companies that are currently trying to work effectively with diverse teams. These sectors have been chosen for their key role in an industry where there is a strong integration of young workers, often from different cultural backgrounds. The eight maps include the most commonly used professional terms and processes, helping to standardize terminology and facilitate effective training and integration of employees into the work environment. This gives young people and foreigners a better overview of the various company processes, which increases their self-confidence and efficiency.

Concept maps also promote teamwork and improve communication in the workplace. When training young workers, especially expatriates, concept maps help them adapt more quickly by offering a clear and structured view of their work activities. This reduces the likelihood of mistakes caused by misunderstanding and increases work confidence and efficiency.

3.1 Concept maps of industrial processes and technologies

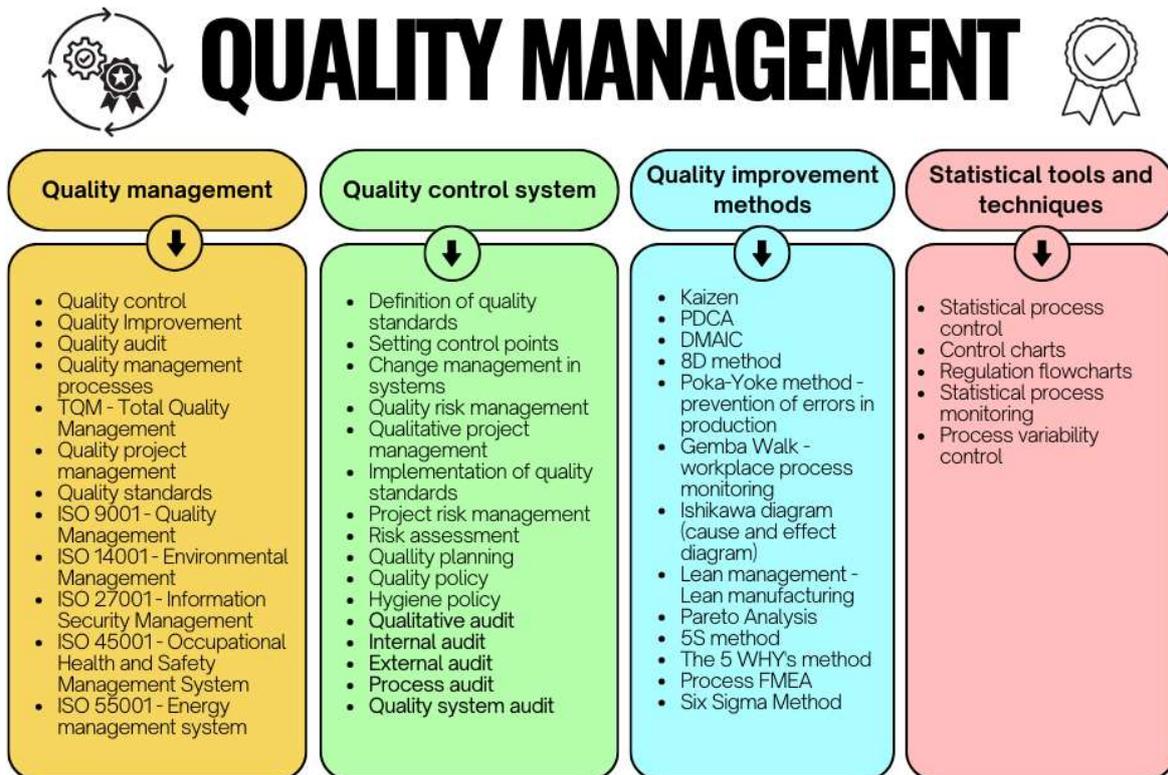
The created concept maps are freely available on the project website <http://www.laserneedle.cz/erasmus-102278>.

The following are specific examples of the use of maps in each area and a preview.



3.1.1 Quality Management

In the area of quality, concept maps help visualize key processes such as product inspections, implementation of quality standards (e.g. ISO 9001), or failure mode analysis (FMEA). For example, new employees, including young workers from Ukraine, can easily learn the quality requirements for products, which reduces the risk of poor quality production. Map translations provide a direct understanding of quality management practices.



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3.1.2 Production control

Concept maps for production management contain structured information on production planning, task allocation or optimization of production lines. For young foreigners, these maps are an invaluable aid in navigating processes that often differ from those in their home countries. The clear graphical format helps to learn the individual steps of production management in English/Slovenian more quickly, which leads to a reduction of errors in production management.

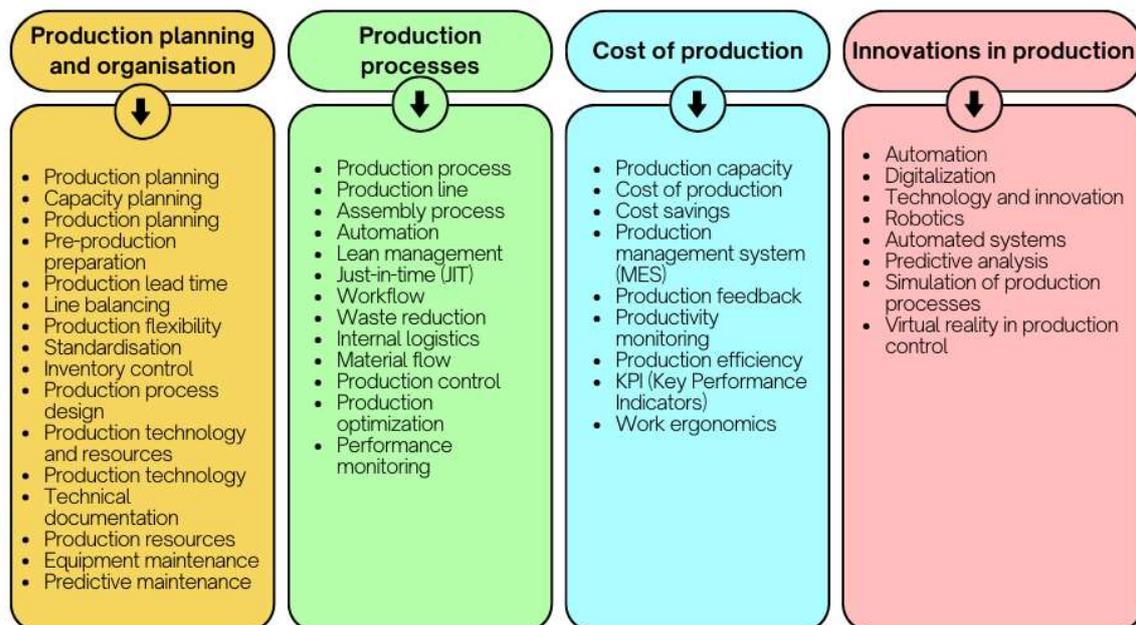


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PRODUCTION CONTROL



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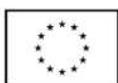
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3.1.3 Human Resources

In HR, maps allow new employees to understand the processes involved in recruitment, training or performance appraisal. For young people and foreigners, the maps can help them better understand company culture, the labour code and employment law. Translations into their native language ensure that there are no preparatory misunderstandings in the area of labour legislation.

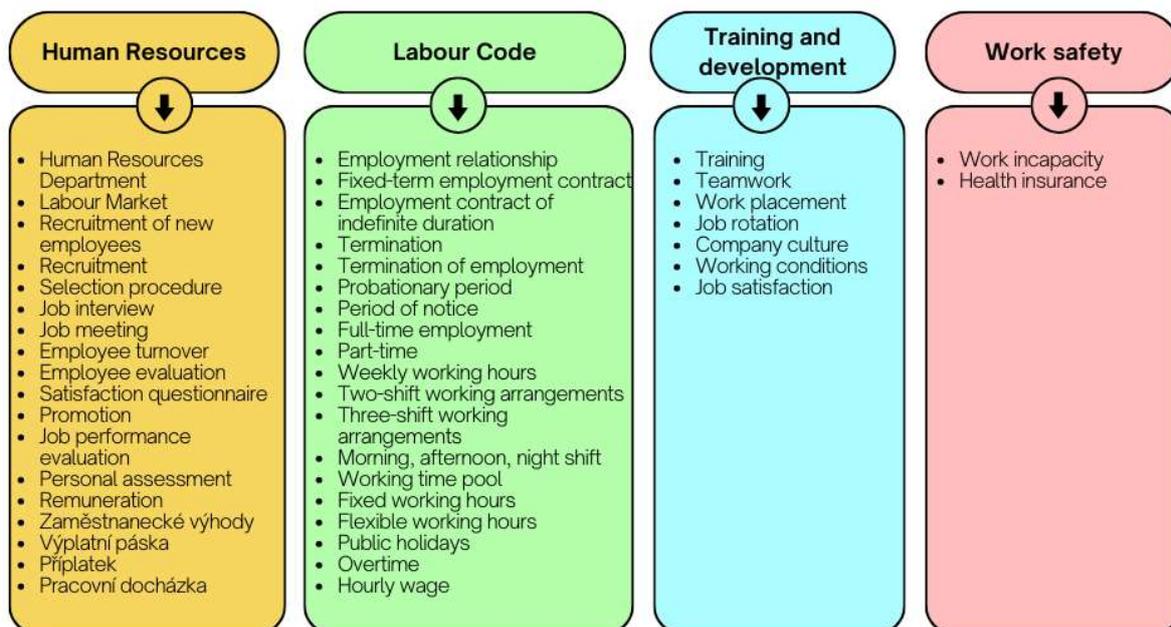


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HUMAN RESOURCES



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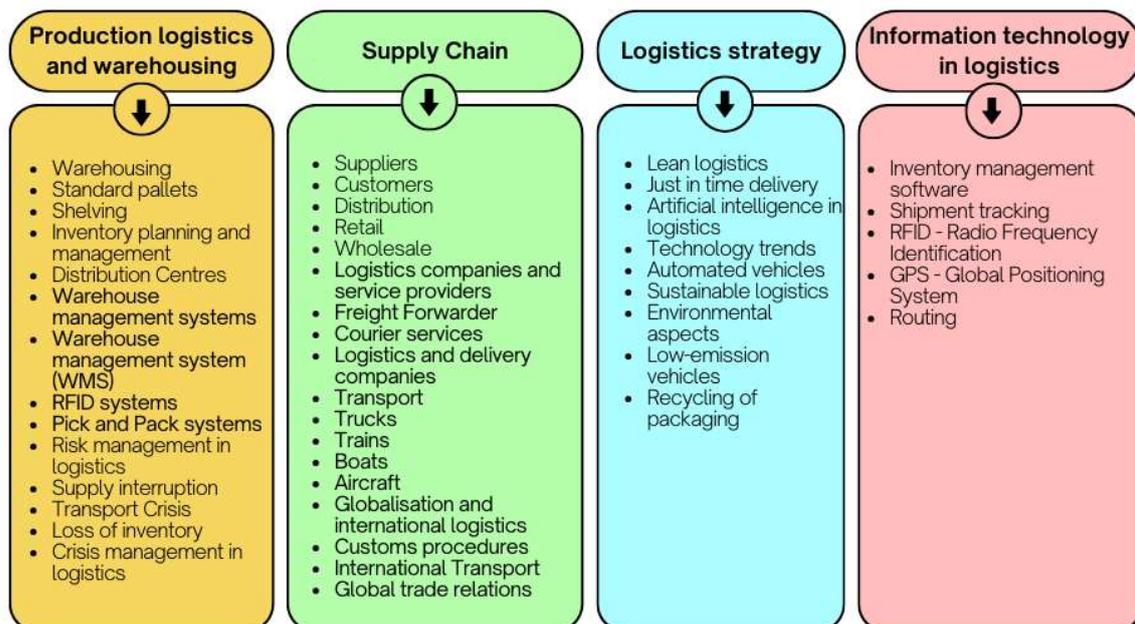


3.1.4 Logistics

Logistics-focused maps address areas such as inventory planning, transport management or warehousing. For young workers from other countries, logistics can be complex, especially if they are not familiar with the local terminology. The maps clearly define selected individual logistics terms, making it easier to integrate new employees with different native languages into work teams and increasing the efficiency of goods transport.



LOGISTICS

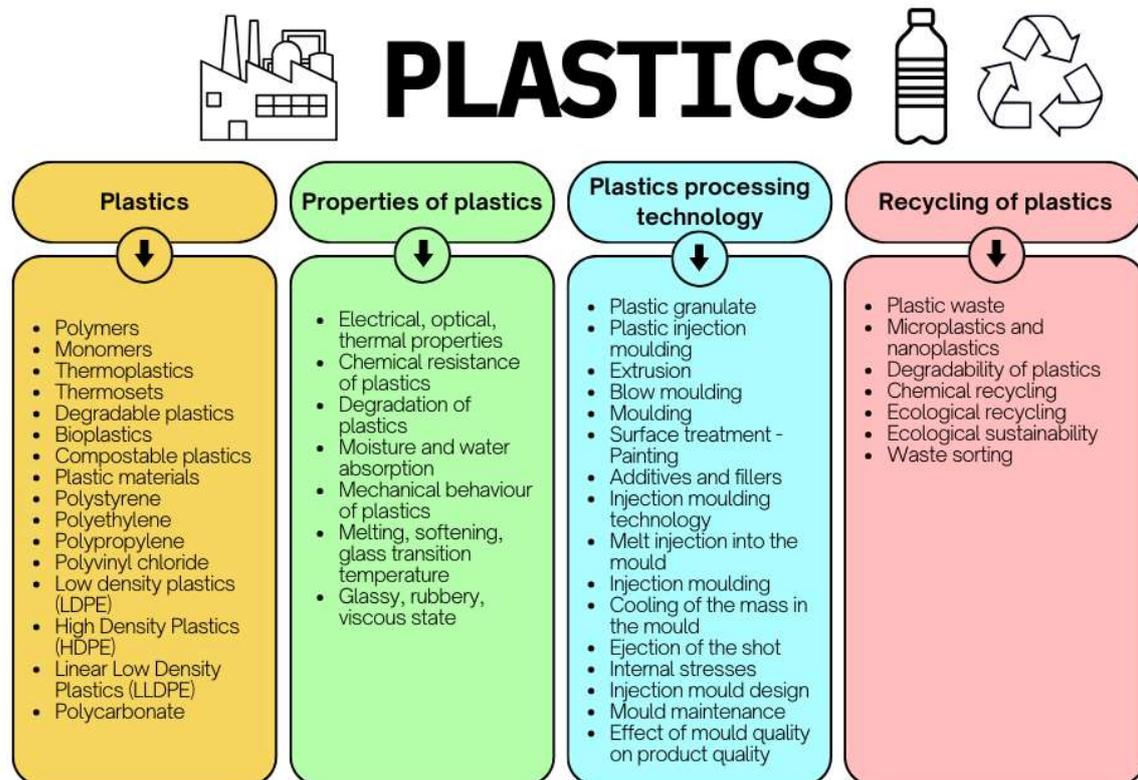


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3.1.5 Plastics

In the plastics industry, the concept map defines processes such as injection moulding, recycling or processing of plastic materials. This sector often requires specific expertise and therefore the maps are adapted to include both basic and advanced terms. Translations into multiple languages make it easier to integrate new workers who have no experience of the Czech or Slovak working environment.



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3.1.6 Engineering

For engineering, the maps cover topics such as mechanical processes, machining or assembly procedures. Young foreigners, who are often confronted with unfamiliar technical terms, can quickly grasp the specifics of this sector thanks to the maps. Clear visualisations of processes allow for effective training and the elimination of communication barriers.

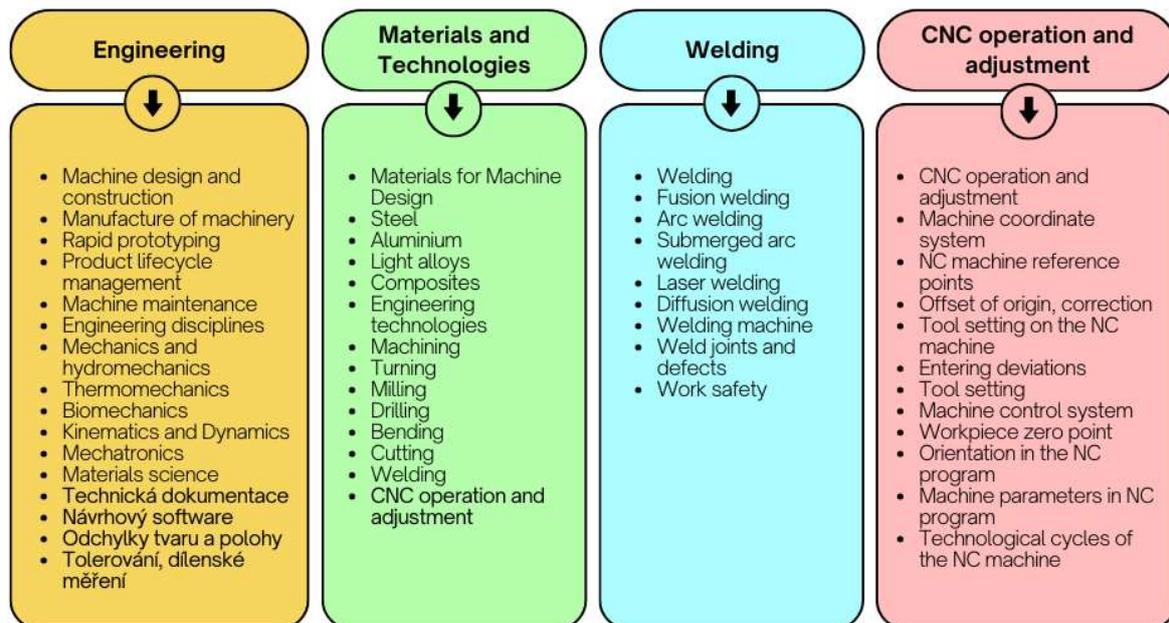


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ENGINEERING



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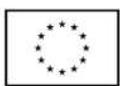
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3.1.7 Electrical Engineering

Maps for electrical engineering include circuit diagrams, safety procedures, or an overview of the components used. These materials help employees understand the intricate technical details. This makes it easy for young people and foreigners to gain the knowledge they need to work safely and efficiently.

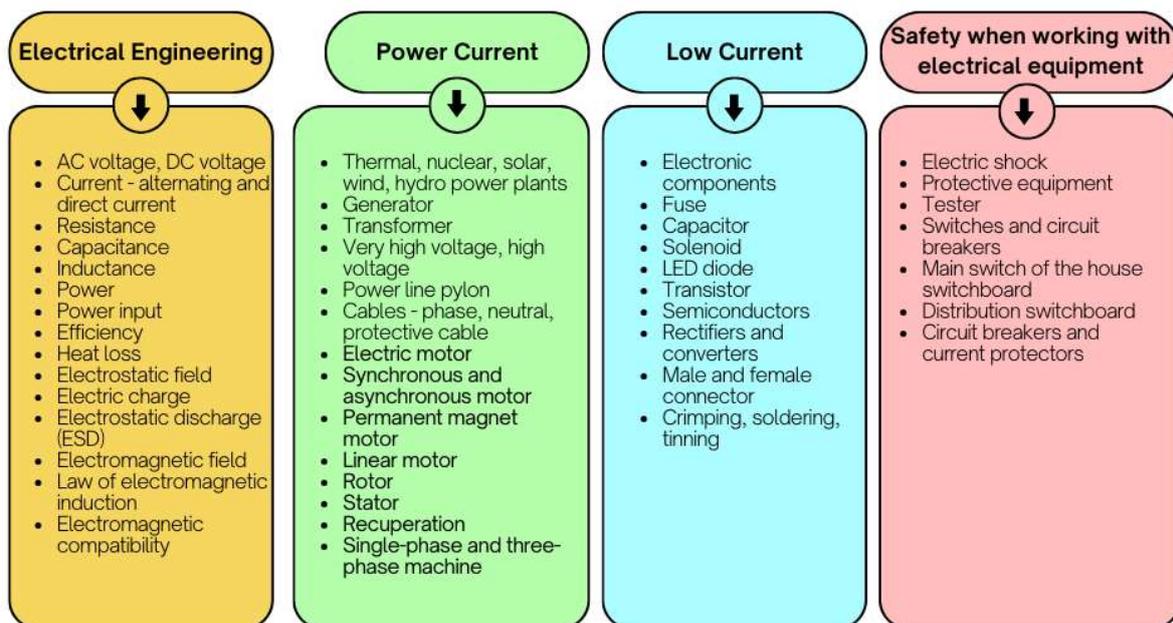


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ELECTRICAL ENGINEERING



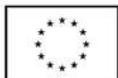
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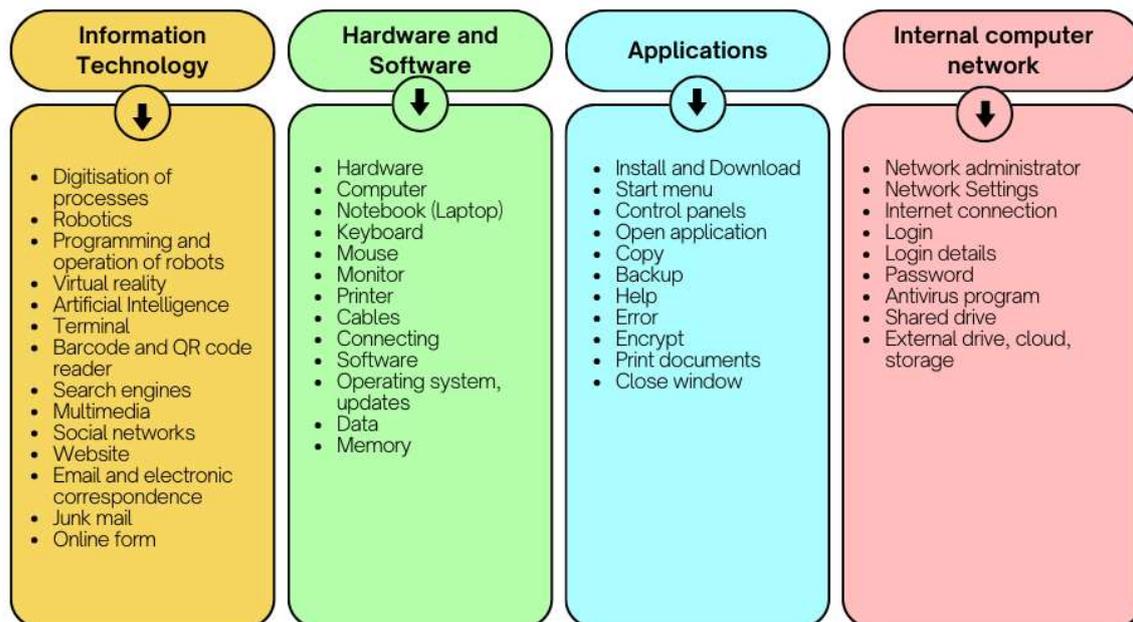
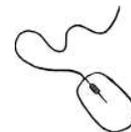


3.1.8 Informatics

In computer science, concept maps are used to represent workflows, for example in software development, network management or cyber security. Young workers and foreigners can better understand the hierarchy of tasks, working tools and standards that are key in the industry.



INFORMATICS



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3.2 The contribution of the maps to the integration of young foreigners with a different mother tongue into work teams

These maps support not only training but also the long-term integration of young foreigners into company structures. Translations into different languages enable them to quickly understand not only their work tasks but also the wider context of company processes. They create a bridge between different cultures, which helps to improve interpersonal relations and teamwork. All of this leads to increased productivity and satisfaction for both employees and employers.

Overall, concept maps have proven to be an effective tool for the adaptation, training and integration of workers from different linguistic and cultural backgrounds. The structure of the maps created is graphically processed in Canva.

For teaching purposes, the maps are didactically arranged so that one A4 sheet clearly lists all 50 concepts in two columns. The left column shows the term in the participants' mother tongue (e.g. Ukrainian, English, German or French) and the right column shows its Czech equivalent. This format allows for quick orientation and efficient learning of new terms.

The whole educational process also includes e-learning courses where participants can practice individual concepts through quizzes and tests created in Google Forms. These interactive forms provide instant feedback, which contributes to reinforcement of knowledge and facilitates participants' engagement in the learning process. At the same time, the comprehensive test can be used during initial training sessions to determine the level of knowledge of new employees with a different learning language and to set a training plan based on this.

The translation of concept maps into multiple languages enables their use in multicultural teams. This makes it easy for young employees to use the maps in their mother tongue, making it easier for them to enter the work environment. At the same time, companies gain a tool that improves teamwork and inter-departmental collaboration. The maps also contribute to increasing overall productivity and creating an inclusive working environment. Concept maps are therefore valuable not only as an educational tool, but also as a means of integrating young workers and foreigners into the work environment. They help with the orientation of professional concepts and processes, thus streamlining training and minimising the risk of errors.



Conclusion

The use of tailor-made concept maps has a positive impact on the integration of foreigners into multicultural work teams, even if the company, employment office, employment agency or secondary school does not work with them primarily.

The most important benefits of using concept maps for the integration of young employees with different mother tongues are summarised below:

- Concept maps bring the language expertise of the employee.
- At the same time, the potential employee gains information about the multicultural environment of companies, which has a preventive effect against xenophobic attitudes.
- By using the concept map during initial training, candidates gain language support and a quicker overview of the concepts used in the workplace, which increases motivation and safety in the workplace.
- Concept maps will give young foreigners a more realistic idea of the operation of an industrial enterprise, its structure and production. If they choose such a profession, there is no disillusionment later on.
- Concept maps support easier and faster integration of foreigners into the work team.

The methodological guide summarises key insights into the creation and use of concept maps that can improve processes in different areas. Their versatility makes concept maps an ideal tool for visualising complex information and facilitating the integration of young people and foreigners into the labour market.

Concept maps are visual tools that help to organize and present information using concepts and their interrelationships. It is a graphical representation of knowledge. Concept maps can thus be used very effectively to improve learning and communication when integrating young foreigners into multicultural work teams.



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Educational organisations and career guidance services can facilitate learning or consultation through concept maps by linking theoretical knowledge with practical applications. Industrial companies use them to visualise production processes or to adapt new employees to the work environment to facilitate professional language learning.

Benefits of using concept maps

- Maps simplify learning by visually displaying them and narrowing down the amount of material. This promotes easier learning of concepts and faster understanding of processes. Thus, with a concept map, even complex information will be better understood.
- Maps allow for clearer information transfer between different departments, teams or individuals. In a multicultural environment, they help bridge language barriers and promote effective communication.
- Concept maps can be adapted to different target groups and needs, everyone can use or create maps according to their needs, so concept maps are a very flexible teaching tool.
- Graphical representations tend to be more attractive than text, which motivates users learning and increases the effectiveness of teaching.

Concept maps are therefore not only a tool for visualising information, but also a means of language training for new employees, improving work safety and effectively integrating foreigners into multicultural teams. Any organization that wants to effectively integrate diverse groups into its multicultural diversity team should consider using them or creating them themselves.



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