CAR Master
Interview Results Analyses
– PR1 Benchmarking Report

CAR Master October 2022

Abstract

A summary of the outcomes from the interviews with HR managers and masters conducted from May to August 2022 in six CAR Master project partner countries.

In this document, we have tried to present as efficiently as possible a considerable amount of data collected from all interested parties from all CAR Master partner countries, it contains a text part appropriately supplemented with graphic elements, tables, graphs, or images.

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CAR Master, October 2022

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CAR Master Interview Results Analyses – Benchmarking Report

Introduction

This is a summary and comparison of the answers collected during interviews with HR managers and masters conducted from May to August 2022 in six CAR Master project partner countries.

CAR Master project

Masters in production are cited by HR professionals as a key group that they need to focus education on. In January 2022, the partners of the CAR Master project from six EU countries started work on the preparation of a platform aimed at training masters in production. The project, co-financed by EU funds under the ERASMUS+ program, will be implemented by the end of 2023.

CAR Master consortium

Austria (AT) bit schulungscenter GmbH

Czech Republic (CZ) EuroProfis s.r.o.

Germany (DE) IHK-Bildungszentrum & International

Poland (PL) Danmar Computers

Slovakia (SK) the Automotive Industry Association of the Slovak Republic

Spain (ES) FEMEVAL

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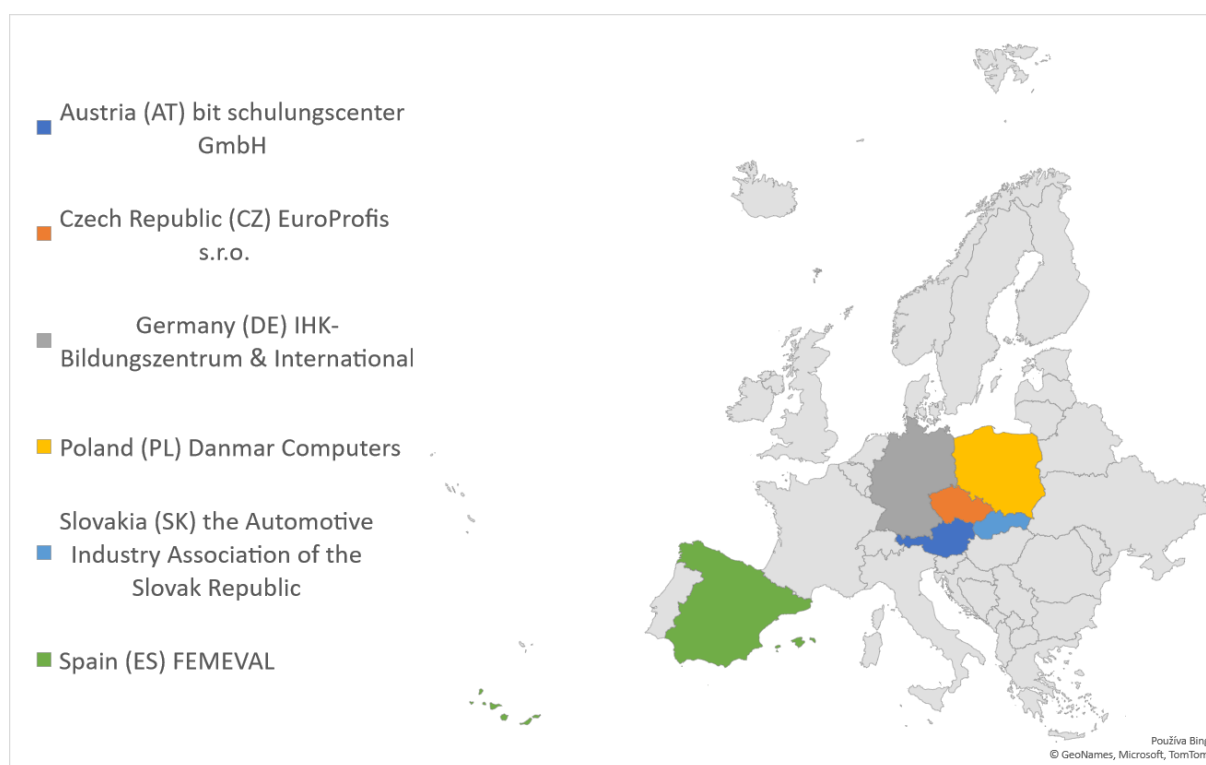
Figure 1 CAR Master consortium map

Austria (AT), **bit schulungscenter GmbH**, a leading education provider in the area of labour-market projects, vocational education, training, and employability

Czech Republic (CZ), **EuroProfis s.r.o.**, an education provider focusing on training mainly in the automotive sector, project management on the national and international level

Germany (DE), **IHK-Bildungszentrum & International**, subsidiary of the Chamber of Commerce and Industry (CCI) Eastern Brandenburg, VET provider, dual vocational training (IVET & CVET), digitalization, a succession of enterprises, recognition of competencies, talent management, etc.

Poland (PL), **Danmar Computers**, operating in the field of Information Technology, with experience in developing modern web and mobile applications that are used for educational purposes

Slovakia (SK), the **Automotive Industry Association of the Slovak Republic**, a non-governmental interest association of legal entities, with a membership base of 200 members employing more than 100,000 people

Spain (ES), **FEMEVAL** is a not-for-profit organization that represents companies of the metal mechanic sector of the region of Valencia, representing more than 3 500 companies, mostly SMEs, belonging to the metal industry, trade and service sectors

Main project results planned

- Definition of key skills of masters
- CAR Master curriculum
- CAR Master learning experience platform
- Face-to-face study
- Accreditation CAR Master
- CAR Master xlearning platform (pilot test/finalization)

Task Summary

- Project Result 1 (PR01) Definition of crucial skills for masters, 01/2022 – 09/2022
- PR1 planned output Interview Results Analyses – one document for both groups interviewed containing feedback from HR managers and feedback analyses from masters/supervisors.

In September 2022, we successfully achieved the first result of the project (PR1). We carried out surveys, desk research, in individual partner countries to refine the job descriptions of foremen/supervisors. The most important part was the interviews with HR experts and masters/supervisors directly from the production companies to find out the needs of the target group. The interviews were conducted from June to August, and we have responses from more than 100 participants. In general, manufacturing companies are interested in our project and the upcoming CAR Master educational platform. The first main outputs of the project will form the basis for the CAR Master curriculum and tips on suitable teaching methods (face-to-face and online). This document is a report comparing the data obtained and describes the first findings of our project.

Main interview discussion points were

- to discuss key topic for a Brief Curriculum for masters in production with key stakeholders – representatives of end users in companies,
- to discuss preparation of a concept of the CAR Master Curriculum, to reach agreement on quality expectations on curriculum from industry representatives,
- innovation aspects to be considered, what does not currently exist in companies,
- curriculum development recommendations (competencies and jobs overlaps, dependencies, assumptions, evaluation models),
- to agree on a model Key Competences Framework, Best Teaching and Training Methods - to find out a list of the most suitable topics for F2F learning and a list of most suitable topics for online learning.

Planned Targets

Target for interviews was to compile answers from at least 10 HR managers, and 10 masters per country, and to deliver summary reports per each country, particularly on the master/supervisor job description, competency framework, teaching and training methods, training course quality criteria requirements in general.

measurable amount KPIs

Expert interviews with HR experts (employer´s requirements)
10 interviews carried out in each partner country (60 in total)

Expert interviews with masters (employee´s needs)
10 interviews carried out in each partner country (60 in total)

How?
workshop + interview HR + masters
= base for curriculum, specification of

key topics
competencies
methods

Figure 2 Key performance indicators for the Task PR1 Interview Agenda

Interview Methods

Interviews took place in the form of personal meetings, visits to companies, meetings at events, facilitated focus groups, online workshops, and telephone inquiries.
The company representatives were asked to consult the Interview Agenda, that was unified for all project partners in all countries and translated for easier use with the target group of masters.

Questions from the Interview Agenda

Structured interviews with HR experts and masters were conducted according to an agreed Interview Agenda. The summary of the interviews includes data compiled from the answers to following 10 questions:

- Question No 1 In your opinion, what are the most important competences that a person must have for a position of a master?
- Question No 2 Does your company have a specific curriculum for Masters? If so, what topics and areas of competence does it cover?
    If so, what topics and areas of competence does it cover? (part of the Question No 2)
- Question No 3 What activities are part of a typical day's work for a master in your company?
- Question No 4 What typical working situations are the parts of the master´s work?
- Question No 5 Do you have the feeling that this list (of the 10 topics) is complete or are you missing an essential topic?
- Question No 6 What topic do you miss on the list above?
- Question No 7 I would now like to discuss each topic with you individually in relation to the following questions
    What topics do you think should be covered in each category?
    What competences should be taught in each category?

- Question No 8 Which learning and training methods are you finding effective for education of masters (70% online self-learning and 30% face-to-face)?
- Question No 9 On the basis of the individual subject categories discussed above, I would be interested to know which learning method you find suitable for each topic?
- Question No 10 Is there anything else you would like to add from your point of view?

Interview Results Analyses

Who took part in the interviews?

Summary numbers on interview respondents – companies, HR managers and masters involved in interviews from all 6 partner countries, Austria, Czech Republic, Germany, Poland, Slovakia, Spain. We collected feedback from **63** of companies, **65** from HR experts and **69** from masters/supervisors (Figure 1).

Table 1 Summary numbers on companies involved and respondents per country and totals

Category Name/Country	AT	CZ	DE	PL	SK	ES	Totals
Number of employees in companies involved in CAR Master interviews	23 900	10 730	6 390	5 818	36 939	394	84 171
Number of masters in companies	478	872	128	194	739	54	2 465
Number of involved HR experts involved in CAR Master interviews	12	11	10	10	12	10	65
Number of masters involved in CAR Master interviews	3	17	11	10	18	10	69
Number of companies involved in CAR Master interviews	12	11	8	12	10	10	63

The number of potential users of the CAR Master platform after its launch in November 2023 is approx. **2465** (Table 1 and Figure 2Figure 4) and it was generated based on the Number of masters in companies involved in CAR Master interviews.

Category Name/Country	Austria	Czech Republic	Germany	Poland	Slovakia	Spain	Totals
Number of employees in companies involved in CAR Master interviews	23900	10730	6390	5818	36939	394	84171
Number of masters in companies	478	872	128	194	739	54	2465
Number of involved HR experts involved in CAR Master interviews	12	11	10	10	12	10	65
Number of masters involved in CAR Master interviews	3	17	11	10	18	10	69
Number of companies involved in CAR Master interviews	12	11	8	12	10	10	63

Based on number of employees in companies involved in interviews, the analyses reflect needs of 38 larger companies (not SMEs), 1 micro company, 15 small business and 9 of medium-sized companies (Table 2 Size of companies involved in CAR Master interviews).

Table 2 Size of companies involved in CAR Master interviews

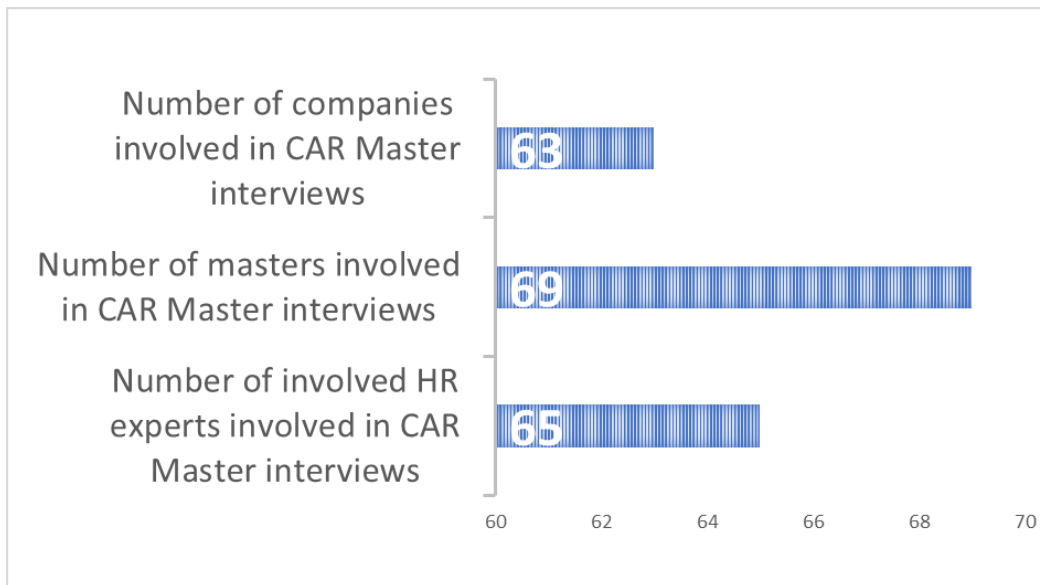| Company size / Country	AT	CZ	DE	PL	SK	ES	Totals
not SMEs	12	8	2	6	10		38
Micro < 10				1			1
Small < 50			1	4		10	15
Medium < 250		3	5	1			9
	12	11	8	12	10	10	63

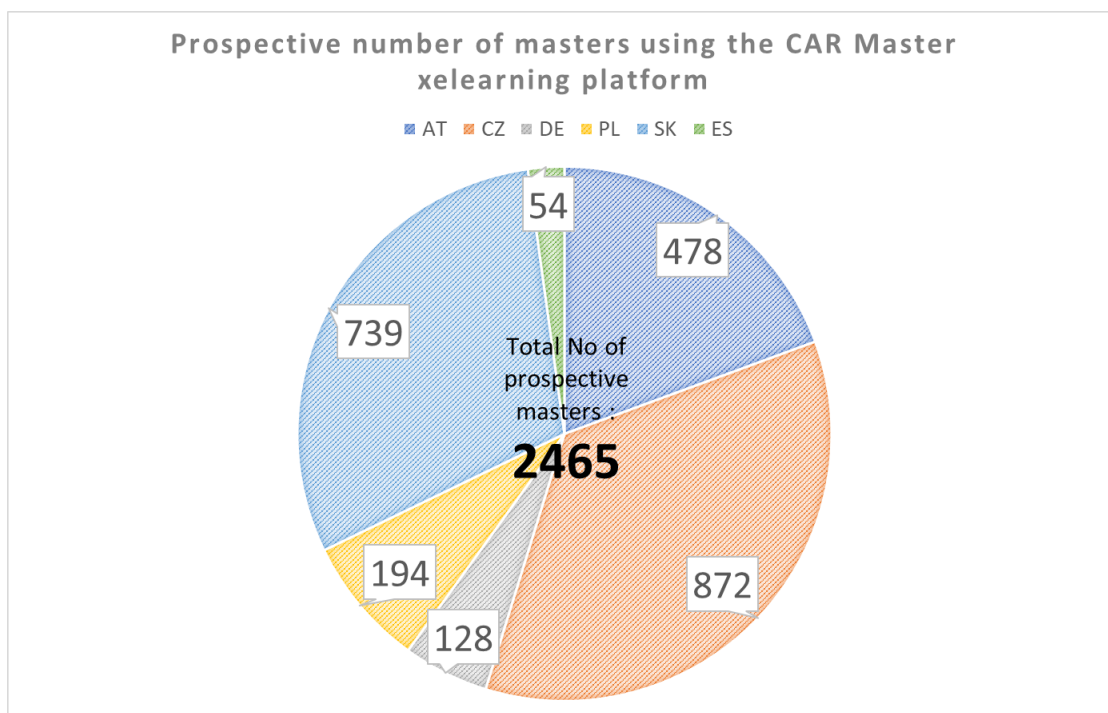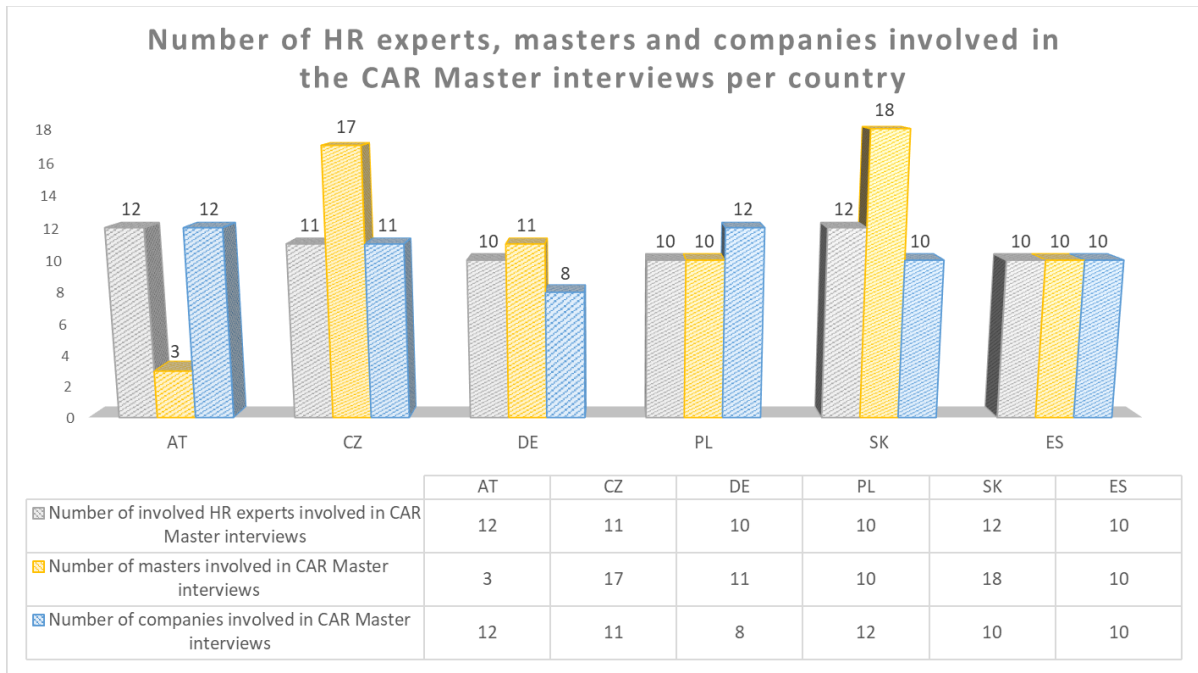Figure 3 Companies, HR managers and masters involved in interviews in all partner countries

Figure 4 Prospective number of masters using the CAR Master xlearning platform after its launch in November 2023

Number of HR experts, masters and companies involved in the CAR Master interviews per country

	AT	CZ	DE	PL	SK	ES
⊠ Number of involved HR experts involved in CAR Master interviews	12	11	10	10	12	10
⊠ Number of masters involved in CAR Master interviews	3	17	11	10	18	10
⊠ Number of companies involved in CAR Master interviews	12	11	8	12	10	10

Figure 5 Number of HR experts, masters and companies involved in the CAR Master interviews per country

Sector of production of involved companies

Overview of sectors of production of companies involved in the CAR Master interviews.

More than half of companies involved are in the automotive sector as suppliers, producer of parts, manufacturers of passenger cars (OEMs), in mechanical engineering, metal industry, aircraft sector, and the rest are from different manufacturing sectors such as (only one company represents each sector on the list below):

- aerospace
- construction of industrial plants
- electronic signage, playgrounds, street furniture
- environmental engineering
- farm equipment
- food industry
- heating equipment supplier
- injection moulding machines - mechanical engineering
- machinery for food industry
- machinery, welding, safety and industry supplies
- manufacturer of petroleum products
- medical - automotive
- metal parts for furniture
- powder metallurgy products
- production of foils
- shuttle carriers, reach stackers, empty container handlers, terminal tractors, forklift trucks
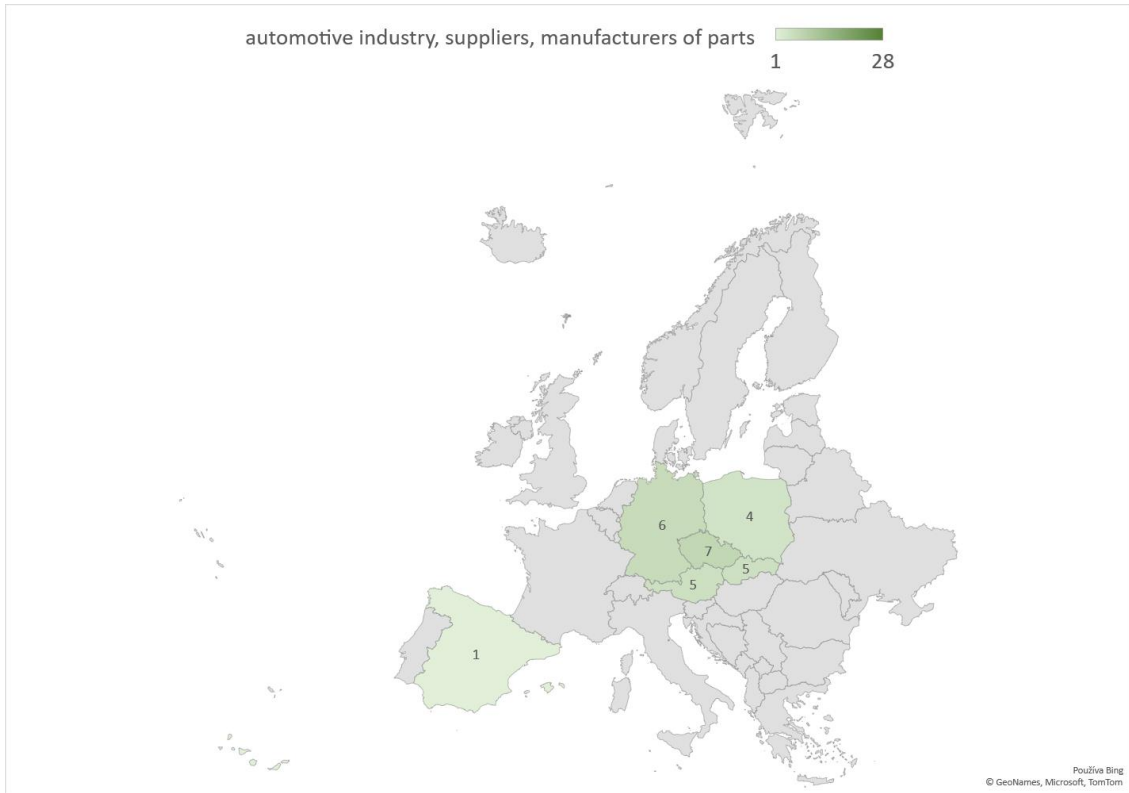- textile machinery

Figure 6 Number of companies involved from the automotive industry, suppliers, manufacturers of parts
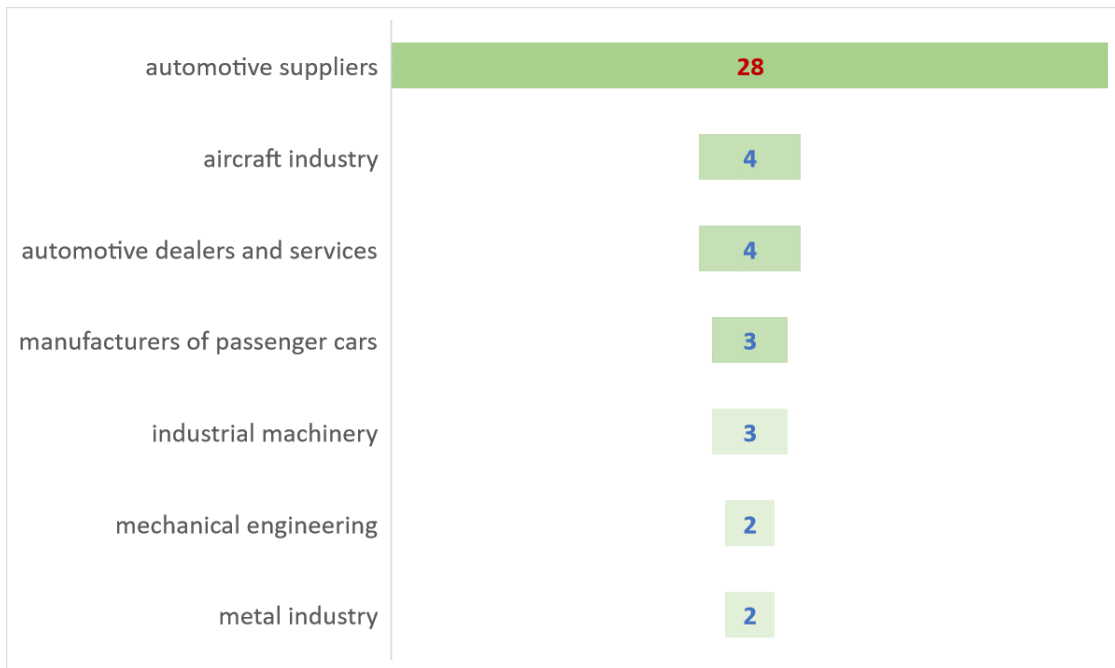

Figure 7 Most represented sectors from all countries

Analyses of the Answers to Questions from the Interview Agenda

The analyses of data compiled during structured interviews with HR experts and masters. The interviews were conducted according to an agreed Interview Agenda in June – August 2022. This summary of the interviews includes data compiled from the answers to questions from 1 – 10 included in the Interview Agenda shared with respondents.

Question No 1: In your opinion, what are the most important competences that a person must have for a position of a master?

All Identified Competencies

The lists/tables below show the companies preference of the competencies to be further developed among the target group of in masters/supervisors/foremen working in production. It would be beneficial for the target group if these competencies were included in the CAR Master training.

A complete list of all competencies identified as important for the target group of masters/supervisors/foremen in production is in the Appendix 2 of this report – The summary proposal of competence framework_2022-09-15.xlsx.

All competences as they appear in interview results of respective countries **can be categorized as knowledge and competency areas**, as they were identified in initial Desk Research of all partners.

1. Personal traits
    Can be defined as innate, inherited features relating to character, a person can develop or improve them.
2. Soft skills
    Can be taught, developed, also considered to be as complement to specialist knowledge and hard skills.
3. Specialist knowledge
    Specialist occupational knowledge, expertise acquired by training, study, or practice.
4. Hard skills
    Specialist occupational knowledge that a master must be able to apply practically, occupational skills.

Personal traits

- Numerical, numeracy skills, mathematics
- Loyalty, commitment, and support, promoting inclusive working environment, being committed to complete a task
- Resistance to stress, resilience, flexibility, resistance to stress due to repetitiveness of operations or activities
- Ability to work in a team
- Social skills, empathy (recognises and promotes talents), patience
- Holistic thinking

- Motivation, willingness to perform, self-determination

Soft skills

- Communication skills, Interpersonal skills and communication
- Work organization and planning, organisational skills
- Time management
- Leadership skills, onboarding, coaching
- Decisiveness, ability to make decisions and take responsibility, must come across as convincing
- Analytical, logical thinking, attention to details
- Strategic and conceptual thinking
- Manual skills
- Motivating employees, motivating to make improvements, evaluating the team performance – Ability to motivate and evaluate the employees
- Problem and conflict solving, advanced communication skills with focus on difficult conversations
- Autonomy
- Performance orientation - Performance and effectivity, focus on results and improvement
- Creativity
- Entrepreneurial thinking
- Assertiveness
- Teambuilding and development, cooperating
- Personality typology, temperament and personality types, self-knowledge
- Intercultural skills and competencies

Specialist knowledge

- Basic financial overview (costs and objectives), economical competencies, calculation, cost, accounting, controlling
- Cross-cutting competencies in mathematics, computer science, data analyses
- Operating technology, production engineering, process engineering, manufacturing processes, technical competencies
- Key figures, standards, and statistics
- Knowledge of production technology
- Environmental standards, protection, sustainability

Hard skills

- Computers, IT, basic IT tools for production, advanced IT tools for management
- Management skills, operations management
- Project management, risk management (prevention)
- Operational problems in production
- Quality systems, standards in operation, QM, QM control (ISO)
- Controlling production equipment, knowledge of production systems and processes
- Technical drawing, documentation procedures in mechanical engineering
- First aid, health and safety at work, ergonomics, fire protection
- Digital, application and use of digital tools, digital skills (Industry 4.0, digitalization etc.)

- Quality assurance and productivity
- Labour code, attendance, payroll, occupational health
- Occupational safety
- Material management
- Optimal scheduling and assigning personnel, personnel management
- Lean manufacturing, specifying steps in processes (value-stream processes), monitoring progress, ensuring process flow, and reducing waste in processes
- Data safety and security: data safety in internet
- Data safety and security: knowing digital safety rules, GDPR
- Data safety and security: creating principles for employees
- Multitasking, effective priorities management techniques

Key Competences

The competencies listed below were **most often identified as key in most or all partner countries**.

Key personal traits
- Resistance to stress, resilience, flexibility, resistance to stress due to repetitiveness of operations or activities
- Social skills, empathy (recognises and promotes talents), patience

Key soft skills
- Communication skills, Interpersonal skills and communication
- Work organization and planning, organisational skills
- Time management
- Leadership skills, onboarding, coaching
- Motivating employees, motivating to make improvements, evaluating the team performance - Ability to motivate and evaluate the employees

Key specialist knowledge
- Operating technology, production engineering, process engineering, manufacturing processes, technical competencies
- Knowledge of production technology

Key hard skills
- Computers, IT, basic IT tools for production, advanced IT tools for management
- Controlling production equipment, knowledge of production systems and processes
- Optimal scheduling and assigning personnel, personnel management

Existence of development plans, annual evaluation - greater number of interviewed companies have = Yes. Existence of curricula and development plans depends on the size of a company, on the number of employees.

AT	CZ	DE	PL	SK	ES
Yes	Yes	No	No	Yes	No

If so, what topics and areas of competence does it cover? (part of the Question No 2)

About 50% of companies in CZ, and most large companies in AT have personnel development plans. There are no concrete training plans, but rules and regulations in smaller companies in AT. Companies in SK have advanced programmes for masters. Companies interviewed in Spain are SMEs an have no training plans for masters.

In Austria topics of training existing in larger companies may copy the official master craftsman certification curricula. Externally lead master craftsman examination of Austrian chambers of commerce consist of 5 modules, entry requirement for graduating from a master craftsman school (equivalent to a Bachelor's degree or engineering qualification) is an apprenticeship diploma or graduation from a technical college.

In DE, many companies do not have but wish to create development plans, requested topics: leadership, sustainability, green deal, digital tools, project and time management. There is some re- and up-skilling training – Industrial foreman (IHK) – available for masters in companies in Germany.

In Poland, SMEs do not have curricula for masters.

Question No 3 What activities are part of a typical day's work for a master in your company?

Representatives of companies from several or all participating partner countries identified a total of around 30 activities that are typically performed by masters in production during a normal work shift.

- Operator management and shift planning, shift panning meetings, operation management, timesheets preparation
- Division of work into subordinates, Plan the day, planning work of a department and subordinates
- Dealing with staff shortages, Personnel planning, Staff interviews
- Dealing with the running of production, ensuring that production is running, The implementation, monitoring and coordination of processes and work chains
- OSH compliance and control, risk prevention
- Resolving everyday conflicts
- Work on PC reports
- Attendance of subordinates, attendance processing in SAP
- Meetings with management and direct reports, reporting to superiors, interaction with other departments
- Employee training: labour code, on OHS, fire and environment protection, work procedures, newcomer training, responsibility for the training of apprentices, further training needs planning, engaging in HR activities

- Quality monitoring, Check measurement reports, Quality inspections, Quality of production processes, Quality of produced series
- Motivation and evaluation of the staff
- Decisions in case of machine breakdown, checking the compatibility of components replacing parts of engines/machines, planning of machine maintenance
- Participation on audit processing, checks and audits preparation
- Participation in customer visits
- Staff training, on-the-job training
- Meeting delivery deadlines, production processes optimalisation, delivery according to quality, cost, delivery, morale, safety (QCDMS)
- The implementation, monitoring and coordination of processes and work chains
- Advising customers, writing quotations, monitoring companies processes
- Coordination with purchase area, procurement
- Compliance with 5S, TPM standards during the work shift
- Evaluates and methodologically leads electrical maintenance workers
- Consulting valid technological documentation, internal regulations
- Monitoring the tool inventory
- Material management, planning and ordering material

Activities of masters in production that have been identified by companies in several or all partner countries.
- Operator management and shift planning, shift panning meetings, operation management, timesheets preparation
- Division of work into subordinates, plan the day, planning work of a department and subordinates
- Dealing with the running of production, ensuring that production is running / the implementation, monitoring and coordination of processes and work chains
- Employee training: labour code, on OHS, fire and environment protection, work procedures, newcomer training, responsibility for the training of apprentices, further training needs planning, engaging in HR activities
- Quality monitoring, check measurement reports, quality inspections, quality of production processes, quality of produced series
- Decisions in case of machine breakdown, checking the compatibility of components replacing parts of engines/machines, planning of machine maintenance
- Meeting delivery deadlines, production processes optimalisation, delivery according to quality, cost, delivery, morale, safety (QCDMS)

Question No 4 What typical working situations are the parts of the master´s work?

As the most typical situations the masters must deal with at workplace were identified
- ensuring compliance with production procedures and quality
- solving attendance, shift handover, last-minute absence, finding substitutes for absent workers, personnel planning, and distribution of tasks
- analysing and solving problems

Other situations identified as being an important part of the master's work were

- managing injuries, accidents
- supervision of compliance with procedures, procedures, compliance with safety and health regulations at work
- giving feedback to workers regarding their work performance
- production process problems, supply of material, production planning
- develop procurement and supply strategies, according to the Supply Chain Act, internal CSR guidelines and geopolitical conditions, control and monitor procurement systems and processes
- disciplinary and professional management of employees, resolving conflicts
- administration and clerical work

Question No 5 Do you have the feeling that this list (of the 10 topics) is complete or are you missing an essential topic?

The **pre-project analyses** conducted in 2021 confirmed interest of HR experts in 10 specific topics. The list is of topics is sufficient for most of the respondents but there were also 5 more topics identified as potentially important for masters now and in the future. A draft of a new proposed units is in the Appendix 1 of this report – CAR Master Learning Units and Sub-Units Overview.docx.

1) Basics of Occupational safety and health
2) Use of the Labour Code and its key provisions in the practice of the master/foreman
3) Total Productive Maintenance principles
4) Production process and the role of the master in the production management
5) Quality management methods and the role of the master's in quality assurance
6) IT skills
7) Master/foreman as a key part of production management: a master/foreman in the role of leader and appropriate tools for team leadership
8) Professional communication – conducting evaluation interviews - effective team meetings - basics of presentation
9) Effective teamwork in production and the responsibility of master/foremen
10) Digital skills/Industry 4.0

Question No 6 What topic do you miss on the list above?

Green skills may be important for large companies, OEMs (CZ). The topic of Ergonomics could include aspects of health issues at work (AT), advanced measures to health and safety standards - OSHA (SK), the right kind of posture or equipment. Aspects of diversity at workplace, creating an inclusive culture – could focus on the increased quota of female workers in industries typically created by men for men, managing a more diverse group of employees, individuals with disabilities.

In total, company representatives suggested adding to the list or emphasized the importance of more than twenty issues and topics.
- problem solving
- financial literacy
- green skills

- ergonomics at work
- prevention of diseases
- aspects of diversity at workplace, creating an inclusive culture
- employee administration/personnel planning, including shift planning or recruiting, general management, HR, risk management
- sustainability
- e-mobility
- vocational and occupational pedagogical aptitude AEVO/in-company training
- procurement processes planning, implementing, and optimising, data-based control of procurement systems and processes
- building sustainable, cost-effective, and secure supply chains
- materials
- informatics, data analytics
- business administration
- international politics
- high tech topics, battery production, high-voltage electronics
- 3D printing
- production technologies and work design
- processes know-how, higher level information and production systems
- analytical skills for determining requirements, costs and potential hazards, quality control
- production processes of parallel production lines
- communication skills, communication with customers, team members and parts suppliers

Question No 7 I would now like to discuss each topic with you individually in relation to the following questions

- What topics do you think should be covered in each category?
- What competences should be taught in each category?

Germany suggests a new topic instead of Fundamentals of occupational safety, the new topic is aimed at sustainability and green skills. Fundamentals of occupational safety also is not a priority topic for Czech companies as they have existing internal training on this topic / also it is mandatory in other countries, Polish companies train OSH when onboarding new staff.

The answers were summarized in the Curriculum in the end of each country report and contained the following sub-topics:

I. Fundamentals of occupational safety
- Workplace hazards; identification of threats, risk assessment, COSHH (Control of Substances Hazardous to Health)
- Working at heights
- First aid
- Protective work equipment
- Handling loads

- Compliance to Health and Safety procedures, safety signage, dealing with accidents, etc., prevention of occupational accidents, documentation of injuries, role-model safety behaviours and correct behaviours demonstrations
- Workplace equipment for different areas
- Measures that are prescribed by law
- Measures that are company-specific
- Fire protection and ensuring safety, model actions to ensure and improve safety
- Ergonomics

II. The Labour Code and the application of its key provisions in the work of a foreman

Germany suggests a new topic instead of the Labour Code, aimed at supply chains management, also it is not a priority topic for Slovak companies to be included into the CAR Master curriculum / the topic is considered a task of HR managers rather than masters in Spain, a general knowledge is useful / Polish partners proposed a new topic "II. Technical competencies of a master".

- Starting and termination of employment, overview of provisions on dismissals/terminations
- Observance of breaks between shifts; masters rights and obligations related to absence control
- Medical leave
- Holidays, holiday regulations
- Rights and obligations of employees
- Letters of reproach
- Transfer to another job
- Medical examinations
- Financial and economy literacy (also proposed as a new topic by the Slovak HR managers)
- Working time regulation
- Consequences in the case of overruns

III. Total Productive Maintenance (TPM) principles
- Structure and basic objectives of TPM; principles and methods and its application
- Creating a maintenance strategy, machines and equipment maintenance, inspections
- Data collection, evaluation, and visualisation
- Structured improvement approaches
- TPM Tools: Predictive Maintenance
- TPM Tools: Productive Maintenance
- TPM Tools: Autonomous Maintenance
- 7 steps of autonomous maintenance
- Link to 5S (workplace organization principles)
- Organisation and visual management
- Delegate responsibility for TPM to all staff in your team
- Maintenance and cleaning basics
- Staff instruction
- Stress and risk management
- Training employees on the job

IV. Production process and the role of the foreman in production management

- Material flow in the company
- Benchmark learning from others
- Process optimisation; process improvements using Integrated Production System and Lean manufacturing principles such as Kaizen, Poke-Yoke, and 5S
- Control of the manufacturing processes
- Instruct and instruct employees
- Standing up for the concerns and issues of the employees
- Promote the willingness to perform and the performance of the employees
- Procurement processes planning, implementation and optimisation
- Specific production processes
- Organisation of production, Production planning and management
- Basic definitions, Pillars of the production process in the automotive industry

V. Quality control methods and the role of the foreman in quality assurance

- Basic methods of quality: 5S, 8D, Ishikawa, Poka-Yoke, Kaizen, fish-bone root-cause analyses, brainstorming methods, 5x Why; Overview of quality measurement tools/processes
- Procedure for handling NOK pieces
- First piece inspection, last piece inspection
- Working with gauges
- Writing SPC cards and KP cards
- Processing complaints
- Preparation of test reports
- Data analytics: data and methods
- Basics for the production audit processing
- Understanding of Quality Systems and Standard Operating Procedures
- Setting SMART goals (specific, measurable, achievable, relevant and time-bound)
- Motivating all team members to continuous improvement (KAIZEN)

VI. General IT skills

German partners suggest a new topic Digital safety and security, see below XIII. Digital safety and security.

- MS office (especially excel, Outlook (e-mails, calendar work), Basic definitions
- Internal systems SAP
- Touch screen work when collecting data from production/from machines
- Working with the company-specific programmes
- Teams chat systems (MS Teams, other communication and online presentation tools)
- Basic IT tools for production: Enterprise Resource Planning (ERP), Material Requirements Planning (MRP), Quick Response Manufacturing (QRM)
- Data capture simulation: MES, SCADA, PLC... advanced IT tools, process simulator, digital models, data capture simulation: MES, SCADA, PLC... (ES)

VII. Foreman/master as a key part of production management: foreman/master as a leader and appropriate tools for team management/leadership

Considered as important especially by Spanish masters.
- Giving feedback; praise, positive guidance, communicating unpopular measures
- Providing information
- Negotiating
- Motivating and evaluating employees; conducting motivational interviews
- Conflict and problem solving, conflict management
- Leadership: empowerment of all team members to proactively drive engagement and motivation across the team
- Time management, team dynamics
- Stress management
- Employee recruiting
- Shift planning
- Product training
- Important soft skills - future soft skills
- Customer service skills for positive interactions with vehicle owners
- Test your soft skills and learn how to develop them

VIII. Professional communication
- Effective communication, communication skills; advanced communication skills focusing on creating an environment for effective and open communication with own and other teams, groups of workers and functions (across all levels of management)
- Ability to convey information correctly
- Conducting effective (team) meetings
- Presentation basics (especially for audit purposes), presentation techniques; advanced presentation skills
- Aspects of non-verbal communication
- Conversation techniques; advanced communication skills with focus on difficult conversations
- Feedback, conducting evaluation interviews, talent management
- Communication theories
- Assertiveness, personality typology temperament and personality types), self-knowledge

IX. Effective teamwork in production and foreman responsibilities
Considered as important especially by Spanish masters.
- Belonging in a team, Basics of teamworking
- Ability to cooperate, principles of collaboration and teamwork; team-building phases
- Problem-solving skills
- Creating measures for more trust
- Clear division of tasks
- Time planning tools; time management and work-life balance (Work-life balance was also proposed as a new topic by the Slovak HR managers as a topic that could add value to existing in-house training programmes)
- Project management techniques
- Managing resources to ensure delivery against production targets, managing individual and team performance using appropriate performance management processes

- Motivating, coaching and team members personal development
- Education and training plans, how to identify training needs

X. Digital skills/Industry 4.0

- Basics of robotics
- Automation
- SMART factory
- Internet of Things
- Current innovations
- Data security
- Basics of Artificial Intelligence (AI)
- Human-Robot Communication
- E-mobility
- Additive manufacturing processes (3-D printer...)
- How new technologies change the workplace, production processes, added value of new technologies (IoT, blockchain, 3D printing - additive manufacturing)

XI. Environment and green skills, Sustainability

A new topic proposed (particularly by AT, CZ, DE).

- Environmental management system
- Environmental accidents
- Environmental aspects (energy saving, waste separation)
- Waste management
- Guidelines and laws
- Health promotion for employees
- Energy-efficient production and work
- Sustainability and green skills definition
- Green skills/SDGs in Europe
- Importance of green skills/influence of sustainability on the production

XII. Building sustainable, cost-effective and secure supply chains A new topic proposed (DE)

- Supply-Chain-Management (SCM)
- United Nations Guiding Principles on Business and Human Rights and national regulations (Lieferkettengesetz)
- Material flow in the company (note: may be part of the topic IV. Production process and the role of the foreman in production management)
- Supply chains during and after pandemic

XIII. Digital safety and security A new topic proposed (DE), could be part of the topic X. Digital skills, Slovak companies identified IT security as an important topic.

- Data safety and security: data safety in internet
- Data safety and security: knowing digital safety rules, GDPR
- Data safety and security: creating principles for employees

XIV. Technical competencies of a master A new topic proposed (PL), could be part of other topics?
- Basic definitions
- Technical skills for the automotive sector
- Reading technical drawings

XV. Effective planning and the responsibilities of the master A new topic proposed (PL)
- Basics of planning
- Research & Development for growth
- Planning & Scheduling tools
- Preparation of to-do-lists and daily work plans
- Shift planning

Question No 8 Which learning and training methods are you finding effective for education of masters (70% online self-learning and 30% face-to-face)?

(CZ) HR managers say masters have generally no experience with the online methods of education, they have the problem to concentrate to e-learning, MOOC or another form of self-study; some masters would like to try another form of learning, there is interest in MOOC with case studies, gamification and other interactive methods of self-study
(ES) All masters would welcome other interactive methods of study.
(AT, SK) building a team spirit and networking effect can be achieved only in-person, a combination of online with offline can work best
(SK) online methods are important for all 10 topics but content should be in Slovak, not all agreed with 30-70% ratio
(DE) HR experts mostly preferred online method due to experience during the COVID pandemic situation still ongoing in Germany, a new lockdown is still awaited
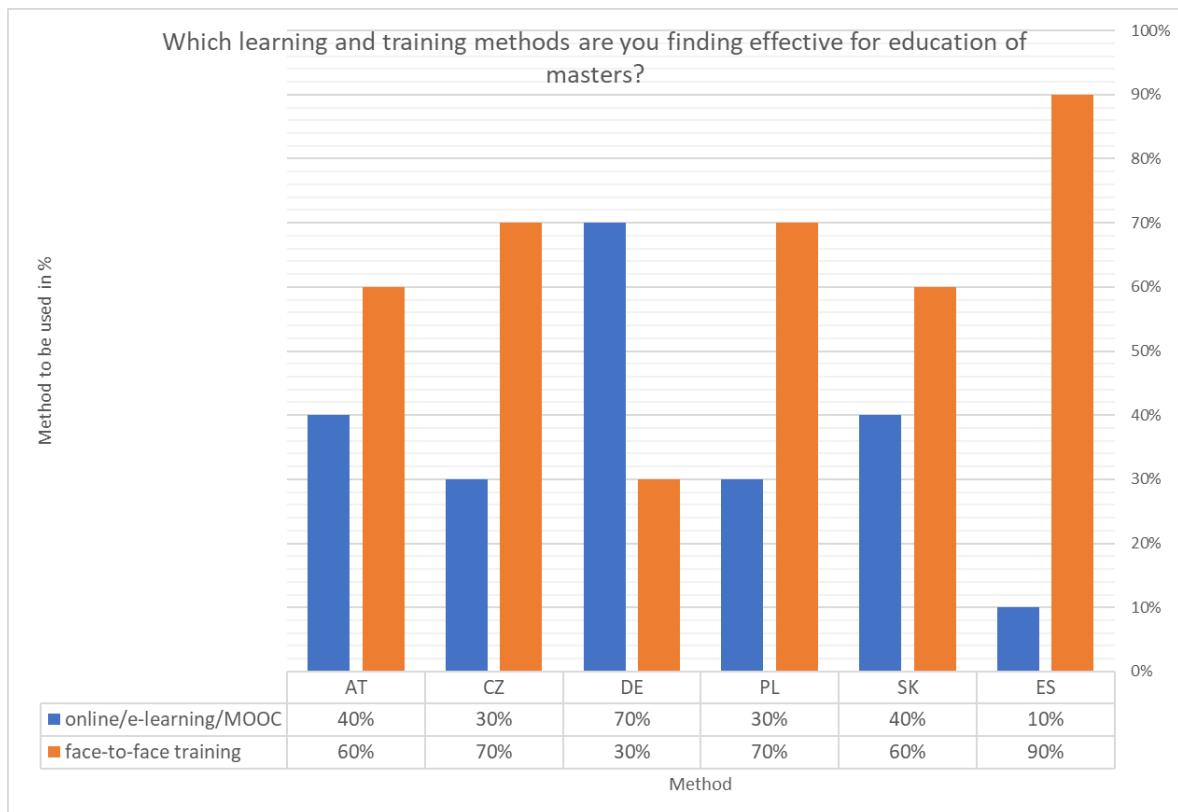
Figure 8 Learning methods to be used - online / face-to-face ratio

Question No 9 On the basis of the individual subject categories discussed above, I would be interested to know which learning method you find suitable for each topic?

(e-learning, MOOC, gamification, quizzes, micro-/nano learning – short videos/podcasts, workshops online/F2F – Is there anything else you would like to add from your point of view?)

(AT) About 4 topics could do without F2F sessions but generally it depends very much on the specific content of the individual topics, not all respondents were enthusiastic about some of the contents to be held online.

(CZ) Face-to-face method was strongly recommended for several topics by Czech respondents, case studies and discussion, masters should share experience and individual self-study will not work.

(DE) Choice of most suitable topics for blended learning was listed; also emphasised was the best practice exchange as important and best mix could be e-learning and F2F, the 4 Step Method was mentioned (?), in-house seminars tailored to companies needs supported by mobile learning, workplace learning e.g. while a machine is running.

(PL) Training on the job remains essential, online is good for theory, very few respondents mentioned the need for F2F training.

(SK) F2F sessions is preferred in case of topics like TPM, Labour Code.

(SK) F2F sessions are essential for effective training.

(ES) Topics VI. and X. online, all other topics should be face-to-face but including videos, quizzes, study cases.

Respondents were asked for an overall evaluation, feedback, or additional recommendations.
- Would you use the prepared CAR Master platform for your employees?
- Do you want to receive the results of the realized analysis?
- Would you be interested in the next project running?
- Would your company participate in the pilot test phase of the whole educational platform?

All respondents emphasize the importance of the management skills for masters and teach them to transfer it to the daily use (CZ, ES). Presented topics to be covered are useful according to many respondents (AT, SK). For improvement the topics of sustainability, diversity and health promotion could be added (AT). Case studies, practical examples, videos, gamification would be appreciated, also MOOC for mobile devices and other interactive methods for self-study; theory to practice transfer is very important (DE). Not everyone can fully benefit from e-learning; follow-up should be considered, sustainability, keeping the content up to date; translation of e-content into Slovak is necessary (SK). The background, including knowledge, competences (general soft skills and ICT skills, and technical) and experience is essential to be good at the job (PL).

Country-by-country conclusions and recommendations

The country-by-country conclusions and recommendations from company representatives, HR managers, talent development specialist and masters/foremen in production are listed below in alphabetical order – Austria, Czech Republic, Germany, Poland, Slovakia and Spain.

Austrian conclusions

A large part of the respondents was very interested in the project and the further project steps. These companies would like to continue to be informed about the project. In Austria, there is already an existing system for training master craftsmen. From the age of 18, people can take the master craftsman's examination or the qualifying examination. A subject-specific training is not necessarily required for this. Therefore, some mentioned that the content of the project could be used for in-house training of production workers. Not all of them were enthusiastic about the fact that some of the contents will be held online. The already defined topics to be covered are useful according to many respondents and there were only a few suggestions for improvement. The sustainability aspect, diversity aspects, and the health promotion of employees could still be added.

Austrian recommendations
- Adaptation of teaching methods to the individual topics
- Less online teaching and self-study learning
- when an online method is used for a particular topic, a face-to-face session could follow so that participants can meet, interact, and exchange ideas on the topic, to strengthen the team spirit and network
- peer coaching can ensure that learning is transferred

Czech conclusions

- All respondents emphasize the importance of management skills for masters and learn them to transfer them to daily use. All Czech companies
- liked the proposed topics and do not need to add something (except for 1 company – Green skills)
- prefer to include to the platform especially management skills with the basics of Labour Code, Lean, Quality and IT/digital skills
- have the internal training for occupational safety and hard skills and it is not a priority for them
- are interested in the prepared CAR Master platform
- prefer face-to-face training for the target group of masters
- require the casual studies, practical examples, and connection to the daily use

Czech recommendation

- 30% self-study + 70% face-to-face learning (recommendation strictly from HR experts, the masters were not so strict)
- Modular programme with the units – everybody can choose the most suitable unit for him/her

German conclusions

- industrial foremen (IHK) training exists in Germany: company further training plan/personnel development planning or further training on demand
- the topics Labour Code and general production process and the role of the master are not "innovative" that are basics for technical employees
- employees/employers have annual mandatory training for occupational health and safety regulations – no need for an additional training
- German companies suggested quite a few new topics and emphasized topics like I. OHS and II. Labour Code is legally required and there is no need to include them in the CAR Master project, which applies also to general IT skills and rather specific, advanced IT skills are needed to be developed based on specific companies' needs
- German companies liked the concept of the project and had some relevant skills to add (Sustainability; Knowledge E-Mobility/E-Automotive; Vocational and occupational pedagogical aptitude (AEVO / in-company training); Planning, implementing, and optimising procurement processes, cost-effective and secure supply chains; Green skills; Diversity & Inclusion; Data-based control of procurement systems and processes)
- Masters & HR managers are interested in a digital CAR Master platform
- Employees prefer blended learning or self-directed digital micro-credentials
- require the link between theoretical knowledge and the best practical examples

German recommendation

Modular flexible learning units; digital micro-credentials – everybody can choose the most suitable unit (self-directed learning e.g. MOOC with internal Learning progress control (assessments); online communication/collaboration) + 1 or 2 F2F meetings with a experts

Polish conclusions

In the position of a master in the automotive industry, a person should have a variety of competencies. From soft to technical competencies. Technical competence is the most important in an industry like

automotive. The combination of soft and technical competencies seems to be the combination of an ideal employee. These skills can be acquired in different forms, either online or offline, through e-learning or F2F workshops. It is important to give a choice to the learner and to provide the opportunity to learn transversal skills, not only technical ones, to offer transparency and to be able to practice them in different environments.

Polish recommendation
- Microlearning for CAR Master Training
- Provide definitions (maybe a glossary); training starts from basic concepts to only then going into more detail
- Provide instructions, video material, and more visual content where possible
- Industry 4.0 concepts should only be introduced as concepts and not be the main focus of the training
- Blended learning

Slovak conclusions
HR managers generally welcome the CAR Master initiative, they are not all sure about using the CAR Master platform and its integration into their existing education programmes for masters (both online or F2F), but they are interested in results, similar projects in the future, and will consider pilot testing of the CAR Master platform anyway, depending on which of the planned and proposed topics will be in the resulting educational program.

Masters welcome the CAR Master initiative, they would like to use the CAR Master platform, want to know about the results of our survey, and join other further activities, projects, and pilot testing of the CAR Master platform.

Slovak recommendation
- 30% online + 70% face-to-face, the method should be considered based on the final curriculum, topics, and specific content of the individual units
- enable CAR Master educational modules to be transferred to the internal corporate LMS system

Spanish companies and masters – conclusions and recommendations
- They all consider it very important to continuously train masters, so reinforcing management skills so they can use them in their daily work.
- They agree with the proposed topics and do not add any other topic
- They prefer face-to-face training for masters with a small percentage of online training
- They would like to participate in the next steps of the project.
- Modular training with online examples and good practice cases.

This is where we go

We believe this report can serve as a good basis for the development of learning and teaching materials relevant to masters in production across different sectors. Although this survey focused on the automotive industry in particular, the data gathered can be used in designing learning and teaching content for masters in other industrial production sectors. The data presented here can help address not only current but also future requirements for master qualifications.

Based on the findings included in this report, we will create the curriculum of the CAR Master learning program – in the detailed curriculum we will set the goals, content and educational methods, we will define the learning objectives that will be set depending on the identified key skills. We will create the necessary content and decide on appropriate methods. We will create a detailed description of the content and methods. The prepared curriculum will take into account the specifics of the industrial production environment of each partner country and possible national differences important in terms of the needs of the masters for their personal growth.

We thank all the respondents for their time and effort in answering all our questions.

List of Tables and Figures

Appendices

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   II.   CAR Master Learning Units and Sub-Units Overview.docx

Learning Unit Title
Learning Phase Title
Learning Objective (LO) Title
Learning Objective Description
Fine Learning Objective (FO) Title
Fine Learning Objective Description

Overview of Learning Units a Phases (sub-units)

1. **Principles of Total Productive Maintenance (TPM)**
   - Maintenance strategies
   - Basics of TPM
   - Delegation of employees

2. **The production process and the role of masters in production management**
   - Principles of Lean Production
   - Work and process planning
   - Resource planning

3. **Quality control methods**
   - Basics of quality planning
   - Aims and benefits
   - Improvement
   - Quality management tools

4. **Digital competences**
   - Digital security
   - Basics of Microsoft Excel
   - Basics of Zoom and Teams
   - Basic rules for presentations

5. **Economic and organisational knowledge**
   - Business basics
   - Staff planning
   - Labour law basics

6. **Professional communication**
   - Theories of communication
   - Conflict management
   - Effective team meeting

7. **New technologies**
   - Basics robotics

- Supply-Chain-Management (SCM)
- Additive manufacturing processes

8. Environment and green skills
- E-Mobility and Automotive
- Green skills in the production
- Resource management

9. Health promotion and risk prevention
- Ergonomics at the workplace
- Mental health
- Occupational safety

10. The leadership of masters
- Leadership
- Teamwork
- Generation management
- Diversity and inclusion

The summary proposal of competence framework	AT	CZ	DE	PL	SK	ES	Notes
Source of data: proposals of a competence framework in summary country reports or/and Question 1	x	x			x		
I. Fundamentals of occupational safety							
Have knowledge and on responsibilities of the employees and management for occupational safety		x		x	x		
Safety at the workplace, accident prevention	x	x		x	x		be able to control and prevent accidents on the job
Law concerning the occupational safety, legal regulation, EU and national		x		x	x		
Internal guidelines for occupational safety		x		x	x		
Risk management (prevention)	x				x	x	a specific amount of hours of training in risk prevention is compulsory in metal sector in Spain
Awareness of the occupational safety measures				x			
Be able to address accidents when they occur on the job				x			
II. The Labour Code and the application of its key provisions in the work of a master				x			a new topic was proposed by Polish partners
Labour Code concerning the shifts/attendance of the operators		x					
Obligatory medical examinations of the employees		x					
Knowledge of internal benefits and penalties and opportunities further to the Labour Code		x					
Financial and economy literacy, costs and objectives		x			x	x	also proposed as a new topic by the Slovak HR managers
Types of contracts	x						
Obligations of the employee and employer	x						
III. Principles of Total Productive Maintenance (TPM)							
Knowledge of the principle TPM and how to use it and delegate to the staff	x	x		x			
Structuring the facilities and employees	x						
Be prepared to take over stress and risk management				x			
Have the knowledge and skills to provide initial training for employees on the job				x			
IV. The production process and the role of the master in production management							

	C1	C2	C3	C4	C5	C6
General knowledge of the lean principles		x	x	x	x	
Organisational skills	x				x	x
Planning implementing and optimising procurement processes			x			
Planning skills	x				x	x
Communicative competence	x				x	x
Logistics basics	x					x
Dealing with operational problems in production					x	
Knowledge of production technology					x	x
Knowledge of the principle TPM and how to use it and delegate to the staff			x	x		
Technical drawing, documentation procedures in mechanical engineering				x	x	
Have knowledge on the pillars of the production process in the automotive sector				x		
Have team management skills for the automotive industry				x		
Have acquired production planning and management skills				x		
V. Quality control methods and the role of the master in quality assurance						x
General knowledge, overview of the quality methods, ISO/VDA	x	x	x	x	x	x
Basics for the production audit processing		x	x			
Understanding data analytics			x	x		
Have competences for reporting, writing protocols and preparing documentation				x		
Know about risk assessment				x		

VI. General IT skills

German competence framework suggests a new category of skills or a new topic Digital safety and security

	C1	C2	C3	C4	C5	C6
MS Office (Excel, Outlook, Word), digital literacy	x	x		x		
Internal systems (SAP etc.), internal databases		x		x		x
Basic IT tools for production: ERP, MRP, QRM						
Data safety and security: data safety in internet			x	x		
Data safety and security: knowing digital safety rules, GDPR			x	x		
Data safety and security: creating principles for employees			x	x		

VII. The master as a key part of production management: the master as a leader and appropriate tools for team leadership						
Organizational skills	x	x	x			x
Ability to motivate and evaluate the employees, motivation to improvements, evaluating team performance		x	x		x	x
Problem and conflict solving, advanced communication skills with focus on difficult conversations	x	x	x		x	x
Leadership, situational leadership, be prepared to take leadership		x	x	x		x
Performance orientation, focus on results and improvement		x	x		x	
Resistance to stress, resilience		x	x			x
Time management		x			x	
Decisiveness, ability to make decisions and take responsibility		x	x		x	
Flexibility	x					
Accuracy	x					
Personal development	x				x	
Loyalty, commitment and support, promoting inclusive working environment					x	
Assertiveness					x	x
Soft skills in the leadership role	x				x	
Intercultural skills			x			
Empathy (recognises and promotes talents)	x		x			
Holistic thinking			x			
Cross cutting competences in mathematics, computer science, data analyses			x			
Be training on human resource management				x		
VIII. Professional communication - conducting evaluation interviews - effective team meetings - presentation basics						x
Communication skills	x	x	x			
Effective management of the meetings		x	x	x	x	x
Ability to evaluate the employees (interviews, feedback)		x	x			
Presentation skills - basic	x	x	x			
Advanced presentation skills					x	

Use of digital communication and collaboration tools/forms; Teams chat systems (MS Teams, other communication and online presentation tools)			x		x	
Have the competence for conducting staff meetings and evaluation				x		

IX. Effective teamwork in production and the responsibilities of the master						
Knowledge of methods and principles of team cooperation, team building and development			x	x		x
Basic social competencies, interpersonal skills		x				x
Factual competencies		x				
Personality typology, temperament and personality types, self-knowledge						x
Being a role model in teamworking					x	
Be a motivator					x	
Be able to manage conflicts at work					x	

X. Digital skills/Industry 4.0: basics of robotics, automation, SMART factory; Internet of Things							
The basic knowledge of Industry 4.0 and robotization			x				
Basic and special knowledge		x					x
Analytical thinking, logical thinking, attention to details , understanding data analytics		x			x	x	
Ability to abstract		x					
Strategic and conceptual thinking						x	
How new technologies change the workplace, production processes, added value of new technologies (IoT, blockchain, 3D printing - additive manufacturing), e-mobility, connectivity					x	x	

Environment and green skills					several countries suggest a new category of skills or a new topic	
The basic knowledge of Environmental Management System, standards, protection			x	x		x
Innovation capacity		x				
Environmental awareness		x				
Environmental standards and protection						x
Law regulation on European level and transfer to national policy				x		
Definition of green skills and their importance				x		

Developing a "green" project for the company		x			

Building sustainable, cost-effective and secure supply chains					German competence framework suggests a new category of skills or a new topic
Knowledge of int. and national regulations		x			
Understanding the change of supply chains		x			
Materials management, supply chain management (SGM)	x	x		x	x

Technical competencies of a master				new topic or area of competence proposed by Polish partners
Possess basic technical skills for the automotive sector		x		
Be able to read technical drawings		x		
Be able to prepare of descriptions to technical drawings		x		
Have knowledge where to seek for training opportunities for professional development in the automotive sector		x		

Effective planning and the responsibilities of the master				new topic or area of competence proposed by Polish partners
Have the knowledge and skills for planning production work		x		
Be able to conduct research for the purpose of growing the company		x		
Have the ability to use planning & scheduling tools		x		
Be able to prepare to-do-lists and daily work plans		x		
Be able to organize shift planning		x		