

# KEY FINDINGS D4.3 BENCHMARKING OF THE EXISTING PROGRAMMES AND CATALOGUE OF THE BEST PRACTICES

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**MAFEX**

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**STAFFER**  
EUROPEAN RAIL SKILLS ALLIANCE



# AIMS

- **Aims:**

The aim of the Task 4.3 is to evaluate the existing paths, curricula, and courses identified in Task 4.1.

Parallely, the existence of innovative teaching approaches will be identified to be properly applied in different frameworks and whenever possible.



# WORKFLOW

- **Workflow steps:**

- First the report summarises the existing railway sector training and education paths, curricula and courses identified in Task 4.1. Task 4.1 assessed the distribution of the training courses suitable for the rail sector and the possible unbalances in terms of geographical localization in European countries, EQF levels and qualification standards (QS).
- The second part of this report summarises new and emerging innovative teaching and training approaches that could be used to develop new railway sector education and training programs.
- Finally, the conclusions set out some key considerations for the development of training programmes and how the new methods and tools outlined above could be used in training programmes.



# APPLIED METHODOLOGIES

- **Applied methodologies:**

- The first part of the deliverable summarises existing training and education programmes in the rail sector in 12 European countries. The 12 countries are: Italy, Belgium, Greece, Germany, France, Spain, Czech Republic, Austria, Serbia, Netherlands, Luxembourg and Poland. The data were collected by means of a survey in task 4.1. The result of this task was a database with the list of VET and higher education institutions offering mobility and training related to the railway sector, differentiated by EQF certification and diploma levels.
- In the second part of the document, an extensive research of emerging methods in the educational system was carried out in order to finally see how they could be adapted to the needs of the railway sector.





# MAIN RESULTS – Country Analysis



Italy offers a good selection of railway academic and vocational training programs. However, Italy does not have any Bachelor's Degree directly related to the railway sector. Further, as any emerging opportunities there are gaps in college education related to how apply key emerging technologies in the rail sector.



Germany is a country with a wide range of training opportunities related to the railway industry, especially in the university sector, where the combination of dual education is particularly noteworthy.

Belgium



Belgium even though it is a country with a fairly active railway sector, there are not many possibilities for students or professionals to specialise in railway issues

France



France, has a wide range of training courses on offer, however, even if it has several options available, training at university level in the railway sector is more limited as not many options are available compared to other European countries.

Greece



Greece has a deficiency at tactical and operational level, so more training is needed, as there are not enough courses for specializing in the rail sector. Furthermore, there are no options available for training at university level as the only option is a subject, so there is a major deficiency in this sense.

Spain



Spain is a country with many training opportunities. Both operators and training centres offer courses to train in the railway sector. But in terms of university training there is a deficiency in Bachelor's Degrees, although there are many subjects available there are no specific degrees for the sector, most of the specialisation is at master's level.



# MAIN RESULTS – Country Analysis

## Czech Republic



Czech Republic has a lack of training courses. As shown in the table above, there are no Master's Degree options and most of the Bachelor's Degree options are subjects, instead of specific Degrees for the railway sector, and finally looking at the training at vocational level very few options have been found.

## Netherlands



The Netherlands has a big deficit in terms of training in the railway sector. Few options are available at university level, and at VET/CVET level it has not been possible to find anything. Moreover, it was not easy to find the different options described above on the internet, as it was necessary to search further to find them.

## Austria



Austria has a different education system compared to other European countries, but even though training in the sector is encouraged from an early age, there are not as many options as one would expect. .

## Luxembourg



Luxembourg has a huge deficit as no training related to the railway sector has been found.

## Serbia



Serbia has different options available but in all the categories above these options are very limited. In university level only the University of Belgrade has training available related to the railway sector.

## Poland



Poland most vocational training is controlled by the government-owned company PKP S.A.. Regarding university level training, there are some sector-specific options at master level but at bachelor level only subjects are taught, not specific degrees



# MAIN RESULTS – New and emerging training tools and method



Skilled and highly motivated workers are essential for an efficient and competitive system



Education plays a vital role on, since it has to guide new workers towards developing the necessary skills to face the future of the sector





# MAIN RESULTS – New and emerging training tools and method

## E-learning

Course or training plan developed through computer networks, offered to geographically dispersed individuals who are able to interact from a different locations and at a different time

## Virtual/augmented reality

Created around a digital ecosystem, through technology, to simulate reality that allows training in environments or activities that in reality would be difficult to simulate

## Gaming environment

Integration of gaming elements into the educational system, with actions or missions in order to achieve goals, overcome obstacles or win (learn)

## Instructor-led individualised training

A qualified instructor or teacher interacts with one or several trainees, with the aim of helping them gaining self-awareness, clarifying goals, achieving their development objectives, unlocking their potential and acting as a sounding board

## Blended learning

Mixing of multiple learning methods, face-to-face classes, online learning...

## Peer led/mentoring learning programme

The process of interaction between an experienced person (the mentor) and a less experienced person in the field (the mentee), who aims to acquire knowledge from the mentor







# MAIN RESULTS – New and emerging training tools and method

## Networked learning

A learning in which information and communications technology are used to promote the connections between one learner and other learners; learners and tutors; a learning community and its learning resources

## Smart learning technologies: personalized learning processes

Learning is based on, smart devices and smart technologies

## Scenario/story based learning

A learning model based on the definition of the experiences in a narrative context, which helps people to frame and understand their perception of the world.

## Experiential learning

It develops people's ability to learn from their own experience within a concrete and well-developed conceptual and operational framework

## Informal learning

Learning gained in an unstructured way, from day-to-day actions such as work, hobbies and contact with other people

## Work- Based learning

A training models capable of resolving the traditional dichotomy between formal university learning and informal learning specific to work contexts





# MAIN RESULTS – New and emerging training tools and method



1. The region or geographical area in which the learner resides
2. In the case of training for employees, the type of organisation or institution in which they work and the roles they play
3. The learner's prior knowledge and experience of the subject
4. The skills of the learners when using the technology
5. The time available for study/training
6. The location from which the training will be conducted (at home, at the office, etc.)





# MAIN RESULTS – New and emerging training tools and method (Where to apply)

## E-learning

- Offers learners the possibility to train at their own pace
- Same training can be offered to different individuals
- Suitable for people who combine work and studies, people in different locations and time slots, or people who study in a language which is not their native language

## Virtual/augmented reality

- Used to enhance learning and student engagement
- Suitable when aiming to train learners in subjects that require hands-on training

## Gaming environment

- If motivation is an issue during training
- Exclusively to support learning objectives

## Instructor-led individualised training

- When the training is more complex or completely new to the learner

## Blended learning

- Key concepts can be developed in face-to-face classes and support materials, extra tasks or communications can be carried out via online platforms
- Allows employees or students to adapt the time to their needs

## Peer led/mentoring learning programme

- When the organisation has an expert in the area in which they want to train others



# MAIN RESULTS – New and emerging training tools and method (Where to apply)

## Networked learning

- For those who want to develop a learning community for the professional development of workers or students

## Informal learning

- It cannot be implemented

## Scenario/story based learning

- When the aim is to provide specific knowledge, describe complex processes, add human aspects to lessons or emphasise the usefulness of knowledge

## Experiential learning

- When you want to trigger emotional reactions in learners
- Appropriate method when the aim is to increase the creativity and reflection of the learner

## Smart learning technologies: personalized learning processes

- Effective digital learning environment
- It can be adjusted to the changing demands of the digital age

## Work- Based learning

- When the training is focused on gaining knowledge in a more practical way
- Appropriate for final-year students entering the sector
- Also for those workers who want to improve their skills





# EXPECTED BENEFITS FOR RAIL SECTOR

- **Expected benefits:**

- The first output of this task is the assessment of the distribution of the training courses suitable for the rail sector and the possible unbalances in terms of geographical localization in the EU Countries, EQF levels, and QS.
- The output of this activity consists of a catalogue of best practices realized by including examples of the application of methodological approaches and technologies to the teaching and learning for development of skills and competences required in the rail sector. Such an output will then be used in Task 4.5 to define, or refine, new or existing educational programmes.





# LEAD AUTHORS' CONTACTS

## **Garazi Carranza & Oihane de la Rua**

MAFEX – Spanish Railway Association  
Parque Empresarial Ibarraerri  
Calle Iturriondo 18 – Edificio A-1,1°C  
48940, Leioa – Bizkaia (Spain)  
Tel.: (+34) 94 470 65 04

[www.mafex.es](http://www.mafex.es)

[garazi@mafex.es](mailto:garazi@mafex.es)

[oihane@mafex.es](mailto:oihane@mafex.es)





# STAFFER

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