

THE SKILLRAIL PROJECT

Rail transport in Europe is a future-oriented industry and is striving to offer an even more attractive, affordable, safe, clean, competitive and reliable transport mode. Innovation is a key success factor for European Railways and the Supply Industry.

The purpose of SKILLRAIL project is to contribute to European surface transport research program implementation and to the enhancement of the sector by fostering a better match between the human resources needs to make railways a more competitive and innovative sector and the offer of skills coming out of the different research based education and training institutions across Europe.

A partnership for innovation, skills development and jobs is envisaged to mobilize support and getting the different players to work together in a collective effort to spread ownership and excellence.

Figure 1 highlights the institutional scope where authorities, regulators, operators, suppliers, etc., have all to be engaged, and identifies the gap where **SKILLRAIL is acting by matching demand and supply of the required skills and competencies to foster the development of the sector** and consequently of more job opportunities and faster incorporation of young talents in the sector.

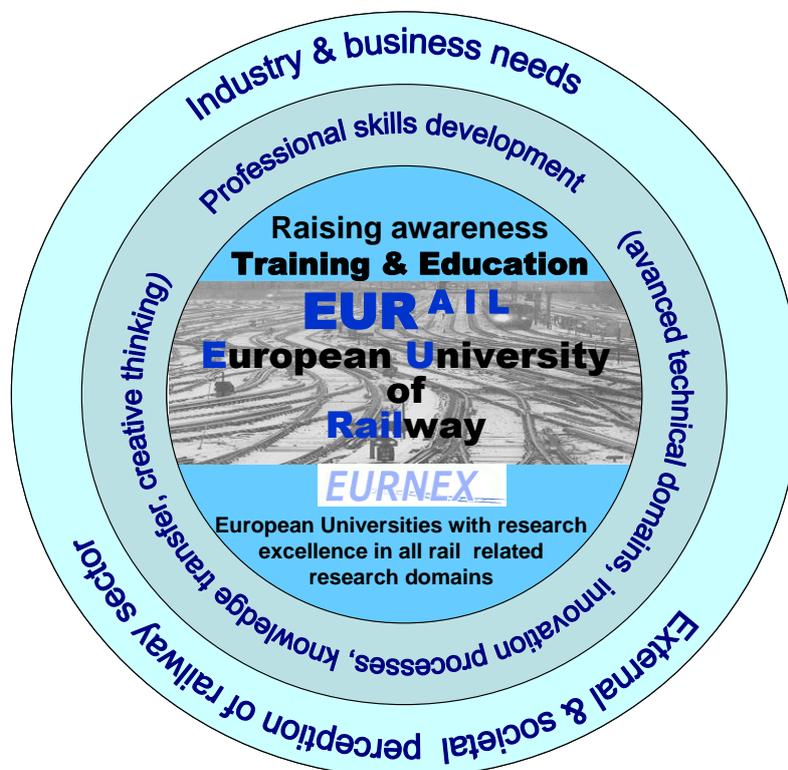


Figure 1 - Training and Education for the Railway sector in Europe

STAKEHOLDERS NEEDS

An intensive activity has been carried out for the identification of the stakeholders' needs. This work comprised the following: **Design of a questionnaire to target railway stakeholders; Collection of stakeholders' contacts and responses and an analysis of stakeholders needs.**

The universe of stakeholders is distributed by domains of activity as illustrated in figure 2.

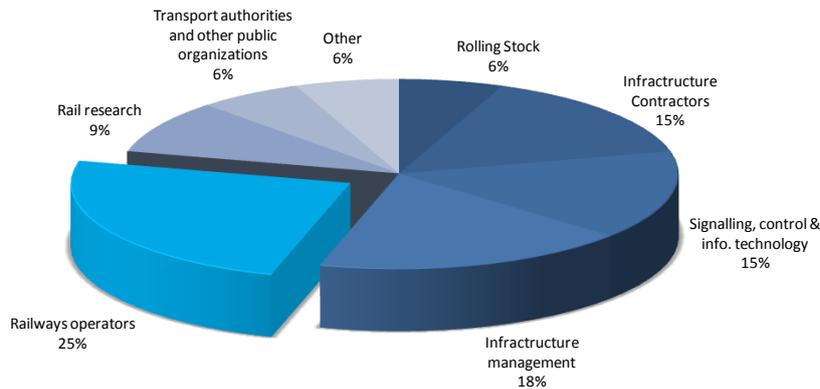


Figure 2. Domains of activity

Competences needs

Respondents were asked to check the competences required for their railway activities according to the qualification level at which they are exerted. Figure 3 shows an overview of the selections made in the eight main categories for each degree.

Railway operators, infrastructure management, infrastructure contractors and signalling represent the most significant contributions, with shares around 25%, 18%, 15% and 15%, respectively.

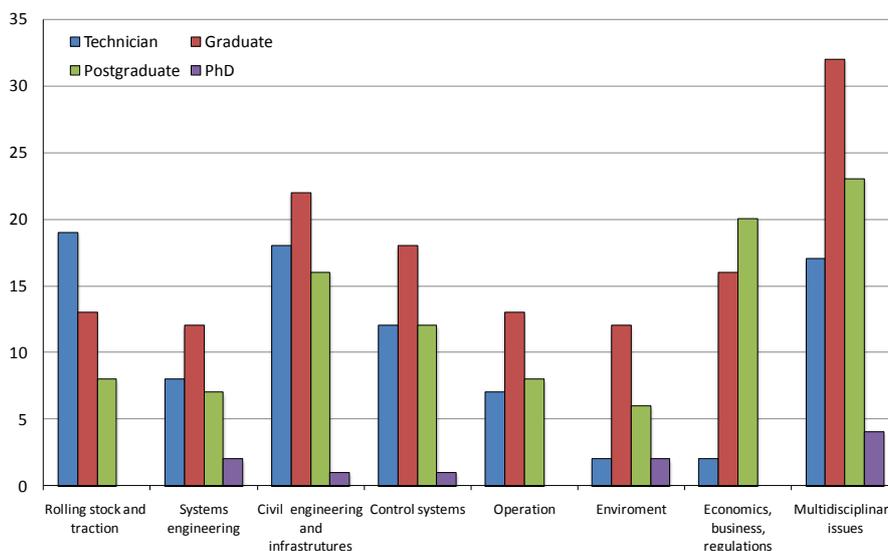


Figure 3. Competence needs by categories

Acquisition of competences and expected contribution from the Universities

High contribution of training (on-the-job training and Short term specialization) for all competences is stressed. Training accounts for 61% of the acquisition process on the average, with a largest part for Interiors, auxiliaries, HVAC (88%).

On-the-job specialization is less common, with values ranging from 10% to 22%, accounting for 16% on the average.

University courses and curricula are unequally participating to specialization, with values ranging from 0% to 57%. The contribution of universities is most significant for competences in the category Economics, Business and regulations.

What further contributions are expected from the University?

Meeting the needs of the railway industry in educating and training skilled technical and management personnel is twofold: the fields of specialization are identified as well as the qualification levels of the corresponding jobs.

PhD holders or holders of multiple degrees are unsurprisingly under 10% for the majority of the respondents (88%). 38% even respond that there are no PhD holders in their company.

In-house and external training are considered, where the first is normally dedicated to specialized and sometimes proprietary matters while the second falls under more general considerations, which can be taught externally. Courses and degrees are subscribed at the personal initiative of the employees ("As individual initiative of the employees"); Continuing education is supported in the frame of curricula and programmes proposed by the employer ("In the frame of agreed programmes and courses providers").

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Most respondents are expecting at least 20% commitment from universities in educational tasks dedicated to railway applications.

TRAINING AND EDUCATION OFFERS IN UNIVERSITIES AND RESEARCH INSTITUTES

The analysis of training and educational programs and projects available inside EURNEX Universities and other relevant higher Education Institutions in Europe and outside Europe (China, India, Russia, South Africa, South Korea and United States of America) has been undertaken. More than 5 000 web places have been surveyed, 134 Institutions from the 7 countries outside EU and 157 European Institutions have been identified with relevant research and education activities in railways.

Global remarks about the countries and data collected are now referred:

- Russia, is the only country, among the seven analyzed outside Europe, that has railway universities.
- USA offers the highest number of courses railway related but most of them are under the umbrella of Civil Engineering subjects.
- South Africa seems to be a country with a transversal education, offering core courses complemented with research work, graduation projects and post-graduation courses to give the adequate skills to railway professionals.
- In general, the majority of the courses referred in the web pages of the seven countries analyzed are Civil Engineering related (except to Russia).
- PhD courses and research projects cover specific railway topics, which are not included in the Bachelor and Master Degree programs.
- The most common keywords railway related among the data collected are:
 - “Transportation Engineering”,
 - “Traffic Engineering”, and
 - “Planning”.
- In Europe, about 30% of the railway related courses are offered at MSc level;
- 1/3 of the railway related offers are presented in short training courses, seminars and special courses, which do not award any diploma;
- BSc and Dipl. Ing academic degrees related with the railway system are less offered to the students than MSc courses.

The distribution of the type of courses (i.e., academic degree level) per “main topics” are shown in Figure 4.

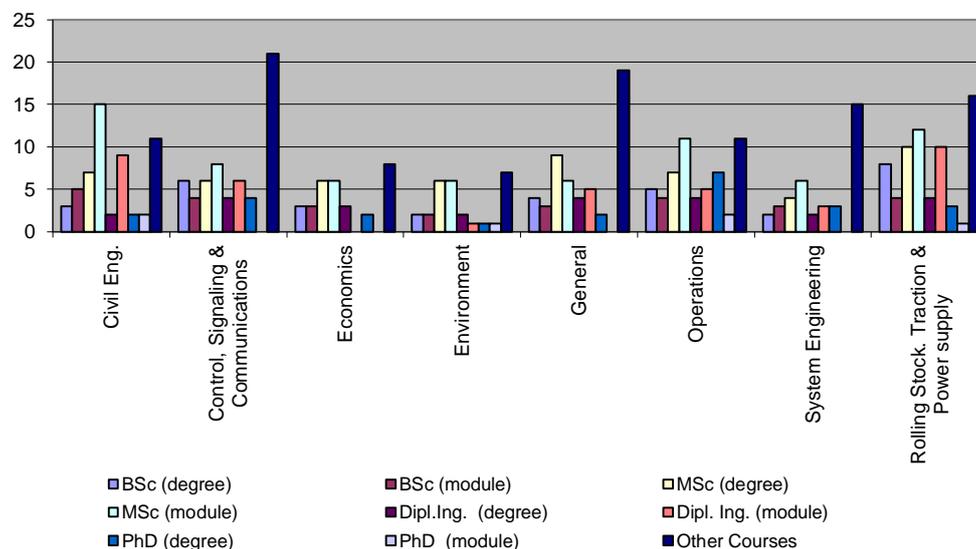


Figure 4. Distribution of the type of courses (academic degree level) per “main topics”

From the graph above it is possible to observe that the main railway topics are covered. The Graph shows also that the number of MSc courses related with the “main topics” is more or less the same to all the keywords.

EURAIL – THE EUROPEAN RAILWAY UNIVERSITY

The development of the European Railway sector needs well managed and collaborative research and targeted research lead education. The SKILLRAIL project will devote a significant effort to design and launch a sustainable framework, EURAIL “European University of Railway”, for creation, dissemination and transfer of knowledge within the railway sector. By addressing the needs of the sector the European University of Railway- EURail will provide the conditions to disseminate the social and industrial benefits of training and education in the railway sector and to develop, at European level, high quality training and education activities for the railway community of tomorrow.

In line with the SRRRA of ERRAC, EURail is expected to promote interaction among its associates and to define clear and realistic objectives in view of the establishment of new and innovative forms for further cooperation between industry and academia.

Based on knowledge, experience and people from "real" universities in Europe, EURail is virtual in nature and aspires to foster, at European level, excellence by gathering and networking the different relevant organizations and institutions around an educational project suitable to the needs of the European Rail sector. EURail's unique feature is this concentration of high-level knowledge and expertise in one single sector/problem-oriented institution. It is expected that EURail will form a coherent community able to define lines of actions and conduct sustainable business in close liaison with the Network of Excellence EURNEX.

The Mission of EURAIL

EURail aims to disseminate the social and industrial benefits of training education in the railway sector and to develop new and innovative forms for further co-operation with industry.

EURail aims to support and disseminate the idea that the railway sector needs advanced engineering education connected with research and technological development.

EURail provides access to a range of professional and academic groups in Europe active in railway related research and education activities. Many of the participating institutions have unique expertise and sophisticated laboratory and testing facilities which can be used to enhance the quality and effectiveness of training and education in the railway sector. A networking process is crucial, and requires a detailed knowledge of the industry needs.

EURAIL Objectives

The following short term objectives for EURAIL are identified:

- Enhance and expand educational access to railway courses
- Enhance educational quality in the railway area (academic, stakeholders)
- Create mechanisms to put forward courses not offered by existing institutions

- Develop e-learning based courses and promote the production of course materials
- Adopt quality assurance procedures of railway courses and award titles
- Promote Joint PhDs using bilateral and multilateral programs
- Promote joint international MSc programs in different rail related areas
- Develop and deliver short training courses (STC)

EURail should support a strategy for incorporating “e-learning” into both mainstream and non-traditional programmes to meet public expectations and to enhance learning opportunities. Regarding this, EURail will set forth a vision for distance learning market in EURNEX community. Throughout the SKILLRAIL project major milestones are proposed to implement EURAIL a start operations on a regular and sustained basis.

TRAINING NEEDS AND REQUIREMENTS

European railways are facing fundamental legal, technological, demographic and market changes that the railways need to deal with in the coming years.

The main changes include:

- Introduction of new European legislation that, among others, promotes cross-border interoperability and common standards in the railway sector.
- Technological developments affecting the professional requirements related to the operation of trains and networks as well as the maintenance of rolling stock and infrastructures.
- The demographic situation implying that a significant number of railway staff have to be replaced in the coming years creating a need to recruit a considerable number of staff for the railway sector.
- New railway undertakings are emerging as a result of the opening of rail markets.

Such changes create a ‘skills gap’ that European railways need to bridge in order to stay in business. However, there is a lack of knowledge about future training needs, i.e., what types of professional skills will be needed in the coming years.

Training Courses for High Skilled Jobs

Short training for high skilled technical and economic jobs are a specific part of the rail training field, which is not well covered by training centers and within the university landscape.

Short training for high skilled jobs can be targeted to all kind of railway stakeholders in order to develop competences standardized or recognized at international level enabling to comply with EU international requirements and legislation and also with the high tech innovations under development/implementation in railway services.

The creation and development of a portfolio of short training courses for high skilled jobs constitutes a benchmark for the rail training system which mainly answers to the following needs:

Education and Training Actions for High Skilled Job Opportunities in the Railway Sector

- To create professional profiles able to operate in the technological changes provided recently by the signaling, communication, IT system introduced in the railway sector.
- To create professional profiles in the international legislation and market liberalization under implementation in the railway sector.

To create an integrated system of training for high skilled jobs the following two main actions are requested and being pursued in SKILLRAIL project:

- The involvement of the railway manufacturers and the UNIFE support in order to overcome the obstacles coming from competition among railway companies, protected know how and patents
- The development of a Training Management System including the inventory of courses performed, contents, tools, facilities, e-learning modules due to the fragmented training activities at national, local and company level.

By applying the market identification model depicted in figure 5 and in view of the results obtained in SKILLRAIL and in the UIC web base the following major topics have been identified:

- multimodal and combined transport;
- new technologies in rolling stock;
- asset management;
- quality (infrastructure, passenger, freight);
- energy efficiency;
- Signaling principles and knowledge in railway transport to maintain and improve railway safety and performance;
- Safety and security.



Figure 5. Market Identification for Training Services