

A STRUCTURED SURVEY ON MSCS IN TRANSPORT AND LOGISTICS FOR DESIGNING A NEW PROGRAMME

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Abstract: *The objective of this paper is to discuss results obtained from a Structured Survey on MScs in transport and logistics which has been conducted within the RiFLE project. RiFLE stands for Rail Freight and Logistics Curriculum Development and is funded by the Erasmus (LLL) programme of the European Commission. The aim of the project is to develop Master Courses to be delivered in English language by the participating institutions as separate but shared programmes in their Universities. The approach is to analyse, enhance and adapt existing courses already offered by the Universities of the participating institutions within a modern rail freight and logistics environment. Therefore the goal of the Survey was to analyse the current Offer of MSc “rail transport and logistics” related courses across the European and non European Countries.*

An inventory for rail, transport and logistics curricula, courses and programmes has been created. Existing relevant programmes from European and other Universities and institutions for Higher Education have been collected and analysed.

For the collection of data a comprehensive questionnaire has been developed. “SuperSurvey” was used to approach intended respondents. SuperSurvey is a user-friendly online platform for collecting information using questionnaires. The target group included professors, lecturers and masters programmes managers in transport and logistics.

Information collected helped to understand different levels of learning and structures of Higher Education such as single modules, bachelor courses, master courses, as well as mobility programmes and patterns.

For the purposes of this paper a brief description of the questionnaire and a summary of the main findings is presented. In general, the results obtained suggest that most Universities having transport and logistics programmes collaborate with railway-focused companies, while the logistics sector is less active in Academia-Industry collaboration.

Key words: *Rail Freight and Logistics, Higher Education, Innovation, Survey*

INTRODUCTION

Knowledge exchange, mobility and expertise are all drivers for a common good. Education and training for more skills are needed than ever before. Jobs related to Rail Industry and Logistics Systems require a higher level of skills and better qualifications and therefore there is a global need for innovation in the field.

In the Freight Transport Logistics Action Plan of The European Commission (COM(2007) 607 final) it is stated that “today, training provided by universities and other institutions varies greatly in Europe. Efforts are required to focus and enhance the qualifications of logistics personnel, notably by strengthening competence in transport, and to support lifelong learning” [1]. The lack of consistency and uniformity of education and training in the European universities motivated us to develop this work.

The objective of the RiFLE project [2] is to develop Rail Freight and Logistics Curriculum for a complete cycle of study by using an innovative multidisciplinary approach, equipped with curriculum modelling tools. The aim is to develop Master Courses to be delivered in English language by the participating institutions as separate but shared programmes in their universities. Our approach is to analyse, enhance and adapt existing courses already offered by the Universities of the participating institutions within a modern rail freight and logistics environment.

RiFLE project team includes participants from United Kingdom, Bulgaria, Italy and Germany. The University of Newcastle upon Tyne (UNEW) represented by NewRail is the leader of the project. Sapienza Università di Roma represented by the Department of Civil, Building and Environmental brings its knowledge and expertise on Rail Freight Operations; Freight Terminals, Railway Freight Equipment Design. The Higher School of Transport “Todor Kableshkov”, Sofia, Bulgaria contributes to the development of modules such as Industrial Management and Logistics, Organization and Management of Rail Freight Systems, Rail Freight Business Cases, Marshalling Yards. The University of Applied Science in Ingolstadt, Germany, will utilise its expertise in computer science to develop a modelling tool for optimizing curricula. Ingolstadt university will also be contributing to modules that encompass CAD systems, Monitoring, Tracking and Tracing Systems, ITS, E-Tools in rail freight and logistics.

The project also promotes intensive collaboration between Academia and Industry. Therefore, apart from the core consortium the project incorporates 9 associated partners from different EU countries in its team.

The associated partners are different institutions from the rail freight and logistics industry. Their role in the project is threefold, as follows:

1. to facilitate the data collection for analysing demands for rail freight and logistics higher education;
2. to assist in developing modules and teaching material;
3. to validate the curricula developed.

The project is not restricted to the core consortium and the 9 associated partners, but is intended to grow by liaising with other national and international campuses and companies specializing in rail freight and logistics.

The innovative idea of RiFLE project is that the courses developed will run in the participating institutions, and they will be compatible to allow the students to attend some of their modules in the other universities. The possibility of a joint programme and degree is also explored.

The courses developed will incorporate cultural and international elements of education, which are quite diverse and highly varied in Europe. The suggested scenario is that each university awards degrees to their own students, however intensive mobility to the other institutions will be encouraged, with full recognition of taken modules. Therefore, Erasmus Mobility Agreements among the four participants will be signed and staff and students mobility will be operated.

The multidisciplinary approach will employ innovation with elements of sustainable development by getting experts to rub shoulders and act outside their field because "rail freight and logistics" is a multidisciplinary field by nature. The aim is to move students away from specialized academic training towards new computer systems, research-driven solutions and real-life problems, which has a positive effect on driving economic progress in large society.

The questionnaire has been developed within the work-page dedicated to develop an inventory of rail, transport and logistics curricula, courses, programmes, training facilities and institutions.

The aim was to collect information that help understand different levels of learning and structures of Higher Education such as single modules, bachelor courses, master courses, PhD, Master of Science as well as mobility programmes and patterns.

A matrix consisting of universities vs. curricula, programmes, teaching modules, teaching hours per module, courses and duration, geographic distribution, etc. was created and the collected data analysed.

The collected information were organised synthetically in order to provide concise input to the subsequent developments of the RIFLE project.

OBJECTIVES

In the framework of the general scopes of the RiFLE project, the first goal was to analyse the current Offer of MSc “rail transport and logistics” related courses across European and not European Countries, in order both to fix the core modules the new Curriculum should provide and to identify possible gaps in the present MSc courses which could be filled in by the new Formative Offer. The main objectives of this phase were:

- ◆ to analyse the current situation with transport and logistics-related courses and programmes offered in Higher Education Institutions;
- ◆ to develop a comprehensive inventory of master programmes in freight and logistics, where rail transport is a focus;
- ◆ to collect a comprehensive list of compulsory and optional modules useful for modelling the new Curriculum;
- ◆ to identify the relationships and cooperation levels between “rail and logistics” Companies and educational Institutions.

In achieving the objectives of this WP, the following steps were followed:

1. questionnaire design for data collection;
2. identification of similar projects as RiFLE: analysis of their objectives and outcomes;
3. integration of information obtained from questionnaire and projects identified;
4. analysis of the obtained results and Conclusions.

QUESTIONNAIRE DESIGN FOR DATA COLLECTION

A comprehensive questionnaire has been developed to collect data for existing educational programmes in transport and logistics. The questionnaire has been divided into three parts as follows:

Part 1 – general information about the respondent; his/her institution, address of the institution; department responsible for the programme(s); programme/course coordinator(s);

Part 2 – general information about the programmes and courses offered and delivered; number of students enrolled per year; Credits given; compulsory vs. optional disciplines/modules;

Part 3 – information about whether the given institution conducts railway and logistics-related research activities and also whether there are any students/staff exchange activities in place, followed by section for comments and suggestions, if any.

The questionnaire received 42 responses in total, 15 out of 42 were complete. Figure 1 shows number of responses vs. countries: the highest number of responses comes from the UK, followed by Italy.

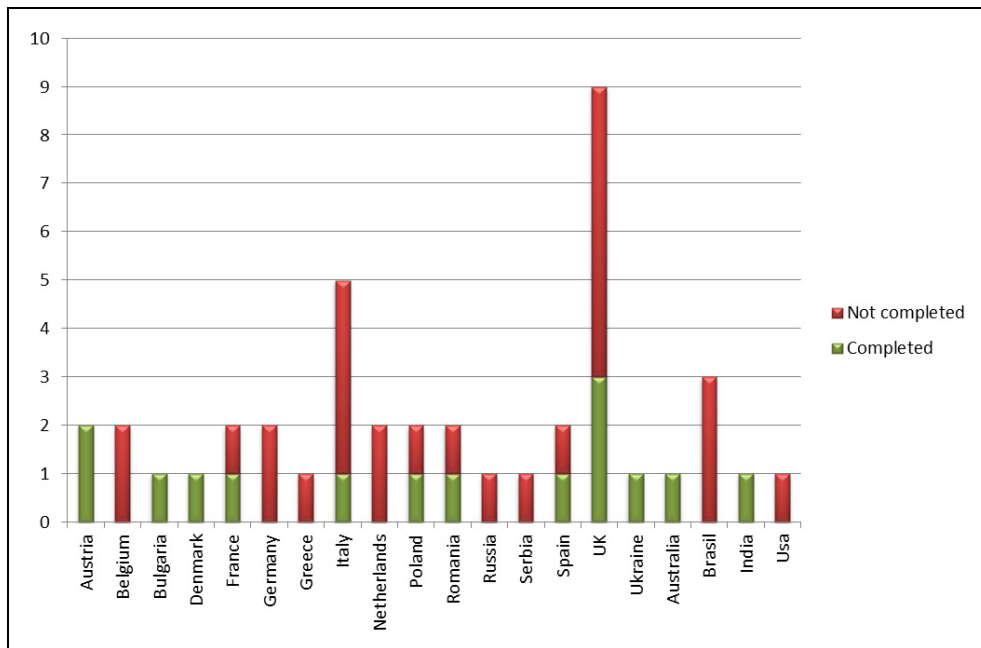


Fig. 1 Questionnaire: number of received responses vs. countries

The results obtained from the questionnaire provided a flavour of the current situation with educational programmes in transport and logistics; however the sample of data collected by the questionnaire was considered unsatisfactory for the purposes of the project. Therefore, it was decided to identify similar project as RiFLE, if any, and analyse their outcomes.

IDENTIFICATION OF SIMILAR PROJECTS AS RIFLE: ANALYSIS OF OBJECTIVES AND OUTCOMES

The following projects have been identified:

- ◆ EURNEX, (EUropean rail Research Network of Excellence), includes some 47 scientific institutes in the area of transport with particular expertise in rail research all over Europe with the purpose to contribute to a more competitive future European rail system by providing excellent research and education organised in scientific poles of excellence [3];
- ◆ TUNRAIL, (Transatlantic Project in Railway Education), is a policy oriented measures project, funded by the ATLANTIS programme, intended to “tune” and intensify the railway higher education knowledge exchange and collaboration between the EU and the USA. More specifically, this project uses benchmarking and comparisons to investigate the current rail programmes, and on identifying how well they address the key aspects of modern railway systems. The project also aims to increase transparency, to identify similarities and differences between railway systems and educational programs and to provide a solid foundation for more extensive cooperation and the establishment of new rail programmes on both sides of the Atlantic [4];
- ◆ FUTURAIL, a FP7 project aiming to contribute to the enhancement of the railway 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 [5];
- ◆ SKILLRAIL, a FP7 project that aims to design and launch a sustainable framework, EURAIL “European University of Railway”, for creation, dissemination and transfer of knowledge within the railway sector [6].

INTEGRATION OF INFORMATION OBTAINED FROM QUESTIONNAIRE AND PROJECTS

Some data collected within the TUNRail project were incorporated into RiFLE analysis. They allowed to increase the sample of the collected data to 72, where 45 out of 72 were complete. Figure 2 shows this graphically. In this case the highest number of respondents belongs to Germany, followed by UK and Spain.

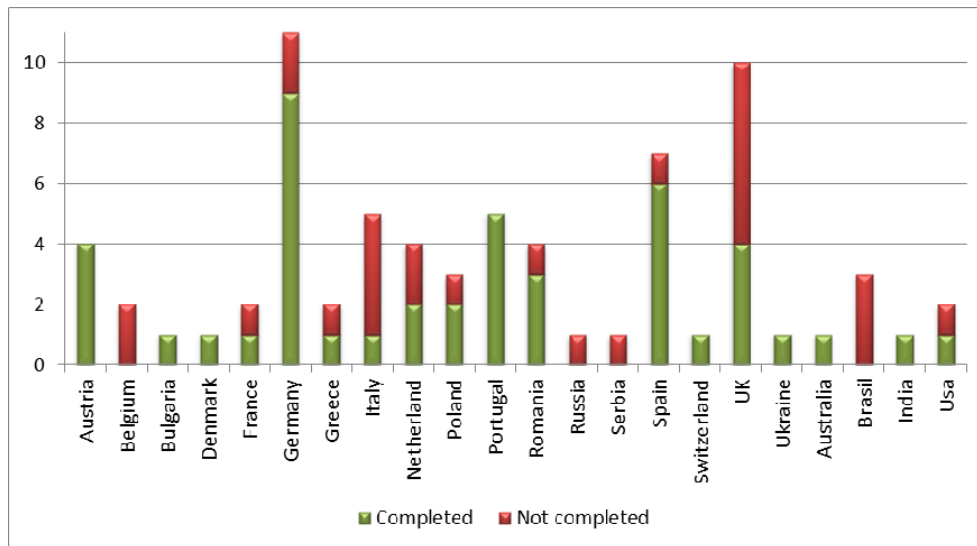


Fig. 2 Database integration: number of received responses vs. countries

ANALYSIS OF THE OBTAINED RESULTS AND CONCLUSIONS

A cluster analysis has been conducted that concluded that Freight Transport & Logistics and Economics-related topics are scarcely represented in the master programmes under study. Our analysis suggests that courses to address such topics appear to be rather limited, which is an interesting finding. Figure 3 shows a representation of relevant topic in the programmes under study (in %). Note that Freight transport & Logistics and Economics are far less represented than Railway and Transport engineering.

For analytical purposes and to further refine our analysis, the collected courses have been grouped in the following clusters of disciplines:

- ◆ Transport Engineering;
- ◆ Railway Engineering;
- ◆ Civil Engineering;
- ◆ Freight Transport and Logistics;
- ◆ Economics;
- ◆ Mechanical Engineering;
- ◆ Environmental Engineering;
- ◆ Information and Communication Technology;
- ◆ Mathematical and Statistical Methods and Tools;
- ◆ Human Factors and Sociology;
- ◆ Interdisciplinary Subjects.

This exercise allowed to better understand the structure and contents of the master programmes under study. Courses offered in more than a single University were also identified, which seems a premise as well as a plausible and promising input for the identification of RiFLE's programme framework.

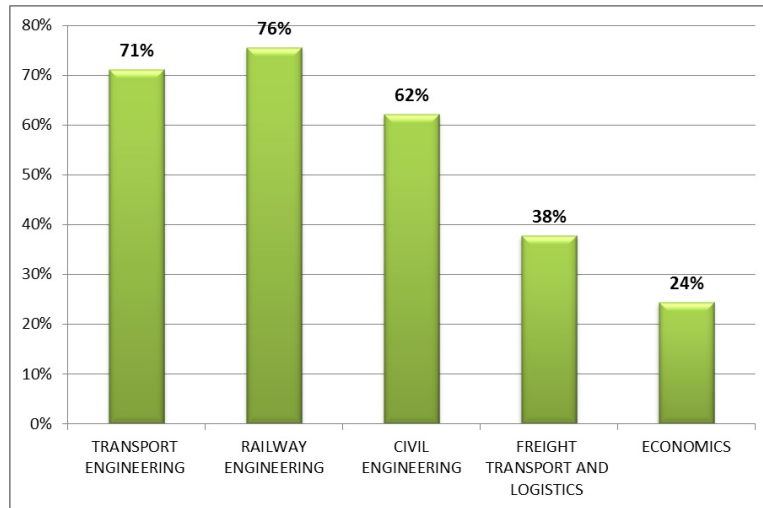


Fig. 3 Relevant topics in MSc programmes in Transport and Logistics

In Table 1 compulsory and optional modules frequently offered in Master Programmes in Railway Engineering are listed. Rail Freight and Logistics module is not mentioned in. Meanwhile, it appears that such a module is neither provided in Master Programmes in Freight Transport and Logistics, which suggests that a niche and a need for it exists.

Table 1 Compulsory and optional modules in Railway Engineering course

| <i>Railway Engineering</i> | | | |
|----------------------------|---|-------------------------|---------------------------------------|
| <i>Compulsory Modules</i> | | <i>Optional Modules</i> | |
| 1 | <i>Fundamentals of Railway Engineering</i> | 1 | <i>Advanced Railway Technologies</i> |
| 2 | <i>Rail Control and Signalling</i> | 2 | <i>Maintenance of Railway Systems</i> |
| 3 | <i>Rail Infrastructure</i> | 3 | <i>Railway Traffic Management</i> |
| 4 | <i>Railway Operations</i> | 4 | <i>Rail Freight Yards</i> |
| 5 | <i>Railway System Design</i> | | |
| 6 | <i>Railway Operations Safety</i> | | |
| 7 | <i>Rail Passenger and Freight Terminals</i> | | |
| 8 | <i>Railway Vehicles</i> | | |

Other interesting results are so far as follows:

1. Over 80% of the surveyed universities revealed that they have collaborated with rail-focused companies;
2. Only 47% of the universities participating in our analysis said that they have collaborated with logistics-focused companies;
3. 87% of the analysed programmes provide opportunities for student and staff exchange, which highlights high levels of mobility in transport and logistics higher education.

REFERENCES

- [1] COM (2007) Freight Transport Logistics Action Plan of The European Commission (COM(2007) 607 final)
- [2] RiFLE, Rail Freight and Logistics Curriculum Development, <http://www.rifle-project.eu/>
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- [4] TUNRAIL, Transatlantic Project in Railway Education, <http://www.tunrail.info/>
- [5] FUTURAIL, the European Railway project for better competition and innovation, <http://www.futurail.eu/>
- [6] SKILLRAIL, the European Railway project for the identification of the necessary skills for the future jobs in the railway sector, <http://www.skillrail.eu/>

СТРУКТУРНО ПРОУЧВАНЕ НА МАГИСТЪРСКИ ПРОГРАМИ В ТРАНСПОРТА И ЛОГИСТИКАТА С ЦЕЛ РАЗРАБОТВАНЕ НА НОВА ПРОГРАМА

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Ключови думи: железопътен товарен транспорт и логистика, висше образование, иновации, проучване.

Резюме: Целта на този доклад е да се представят резултатите, получени от структурното проучване на магистърски програми в транспорта и логистиката, извършено в рамките на проекта „RiFLE”. Пълното наименование на проекта, който се финансира от програма "Еразъм" („Учене през целия живот”) на Европейската комисия, е „Разработване на магистърска учебна програма по железопътни товарни превози и логистика”. Целта е да се разработят магистърски курсове, които трябва да бъдат предложени на английски език от участващите институции като отделни, но съвместими програми в техните университети. Подходът изисква да се анализират, подобряват и адаптират съществуващите курсове в участващите институции в областта на модерния товарен железопътен транспорт и логистиката.

Направен е списък на учебни програми, курсове и програми по железопътен транспорт, транспорт и логистика. Анализирани са съществуващите програми от европейски и други университети и институции за висше образование, като за събирането на данни бе разработен въпросник. За анкетирането е използвана онлайн платформата "SuperSurvey"р която е удобна за събиране на информация. Целевата група включва професори, преподаватели и ръководители на магистърски програми в областта на транспорта и логистиката. За целите на тази статия е представено кратко описание на въпросника и обобщение на основните констатации. Като цяло получените резултати показват, че повечето университети, които имат програми за транспорт и логистика, си сътрудничат с железопътните компании, докато сътрудничеството университет-индустрия в логистичния сектор не е толкова активно.