Deliverable 3.6.1/T 2.6.1

PILOTING OF SELECTED SUBJECTS OF THE SPECIALIZATION MODULES BY PROJECT PARTNERS

TTK / Tallinna Tehnikakõrgkool / TTK University of Applied Sciences

Project partners:
KRAO / Kouvolan Rautatie ja Aikuiskoulutus OY

TSI/TTI / Transporta un Sakaru Instituts / Transport and Telecommunication Institute

HAMK / Hämeen ammattikorkeakoulu / Häme University of Applied Sciences

RTU / Rigas Tehniska Universitate / Riga Technical University
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Introduction

The following topics were agreed by partners to be highlighted in piloting process:

1. How were the students (trainees) prepared for the study process of the subjects of piloting?
2. How did their preliminary knowledge support the study process?
3. How were the general objectives of the selected subject met during piloting?
4. Were the planned outcomes (knowledge and skills) achieved?
5. Finally: are there any recommendations for updating the content of the piloted subjects?
1. Piloting of the selected subject of Module 1

1.1 Piloting Module 1 “Single European Railway Area”, Subject 1 “European Transport Policy”

The lecture of the Subject 1 “European Transport Policy” of Module 1 “Single European Railway Area” was held on Tuesday, March 2nd, 2018 as a part of the course “Transport Policy of European Union” for the first year students of master degree programme “Transport and Logistics” of TSI. The target group included full-time students of groups 1703 MDA, 1603 MDA and 1703MV. The lecture was given in the lecture hall 130 at the Transport and Telecommunication Institute campus. 24 students and 3 representatives from TSI academic staff took part in the lecture. The lecturer was Professor Igor Kabashkin.

At the beginning of the lecture, the goal, tasks, partners and the main activities of the EDU-RAIL project were introduced. The main focus was on presenting the structure and content of Module 1, developed by TSI. The subject of the annual lecture was “European transport policy”.

![Image of the lecture hall with attendees]
The main aim of the lecture was to acquire the skills for applying the main documents of the sphere of the EU transport policy according to the tasks of development of particular transport organizations with a special accent on the EU policy in the Single European Railway Area establishment.

The participants received a handout with the materials of the lecture. Prof. Igor Kabashkin made a presentation about e-learning system for Module 1 “Single European Railway Area”, demonstrating the operation of the system in the Moodle on-line environment.

The greatest interest among students was caused by the section “Rail Research and Innovation in Europe”. The lecture informed the students about Shift2Rail programme, which is the first European rail initiative to seek focused research and innovation (R&I) and market-driven solutions by accelerating the integration of new and advanced technologies into innovative rail product solutions. Shift2Rail promotes the competitiveness of the European rail industry and will meet changing EU transport needs. R&I carried out under this Horizon 2020 initiative will develop the necessary technology to complete the Single European Railway Area.

With the help of e-learning materials from Moodle education environment, the activities of the Shift2Rail were demonstrated.

The students had a very positive response to the possibility of video viewing of several multimedia materials demonstrating the general principles of building the EU railway system and its possible development.

The lecture was of particular interest to some students who work in the railway industry. Students acquired knowledge about Technical Specification for Interoperability. The lecture also included the information about the differences between railways of European countries due to historical events; and of normatives and regulations used in Latvia, Estonia and Finland and of how are they harmonized in relation to each other and according to European specifications.

1.2 Piloting Module 1 “Single European Railway Area”, Subject 3 “Single European Railway Area Content”

The lecture of Module 1 “Single European Railway Area”, Subject 3 “Single European Railway Area Content”, and group roundtables and brainstorming were held on Tuesday, March 20th, 2018.
as a part of the course “Transport Policy of European Union” for first year students of master degree programme “Transport and Logistics” of TSI. The target group included the full-time students of groups 1703 MDA, 1603 MDA and 1703MV. The lecture was given in lecture hall 130 at the Transport and Telecommunication Institute campus. 18 students took part in the lecture and group work. The lecturer was Professor Igor Kabashkin.

In the working process, group exercises for students were prepared to help them develop “soft” skills like speaking up and defending their opinion. This was necessary for stimulating the activity of students in class, and for generating interest into the subject. It was also important for students to get familiar with the concept of project management and to acquire practical skills to work with documentation.

The students were given a short lecture with the main content of the material. Then the students themselves divided into three groups. All student groups had the same tasks. To complete the tasks, the students had to use the e-learning materials of the educational portal. After the independent work in groups, each group presented their results. As a result of the presentations, a general discussion of the issues was held.
2. Piloting of the selected subjects of Module 2 and Module 3

Module by HAMK, Theme 1, Pilot lecture held on Tuesday, March 27, 2018 as a part of the Transport Economy module. The target group included the full-time students of group 2015. The pilot lecture was named “The Opening Railway Market”. The lecture was given in lecture hall A210 at the Riihimäki campus.

The lecturer was Senior Lecturer Teppo Sotavalta.

The list of participants:

Feedback from the lecture participants was collected after the lecture. In Enclosure 1 there is an authentic summary of the feedback in Finnish.

At the beginning of the lecture, the partners and the module structure of the EDU-rail project were introduced. The main focus was on presenting the structure and content of Module 3, HAMK. The subject of the annual lecture was “The Opening Railway Market”.

Here is a summary of the participants’ answers:
What did you learn during the lecture?
Opening the rail system to competition, focusing on the situation in Finland. What needs to be taken into account when opening up the market for competition. How to enter the market? Theories related to tendering and the different forms of the tendering process. The impact of a monopoly on the effectiveness and societal benefits of the railway system. Competition is not necessarily the answer to the problems in the railway system. The benefits gained from competition depend on the investments made into the railway network.

Is there something that you would have liked to learn?
Pricing; more detailed information on this, how successful/unsuccesful this has been in other countries; the state of the railway network management; how the management is organised in different countries; what will e.g. the Ilmala depot look like after external entrepreneurs have taken their own shares there; it would also be interesting to get to know the other parts in the HAMK module.

Would you be interested in integrating into your studies a part from one of our international partner universities, and to conduct virtual studies in an international student group in English?
The replies to this question were as follows: Yes – 40%, Maybe – 40%, No – 20%. This result is suggestive, since there were only 10 responses in total.

I would like to include an international element into my studies, because I am aiming towards international tasks in my career.
The responses were divided as follows: Yes = 40%, No = 60%. This result is suggestive only, since there were a total of 10 responses.

In railway transport my interest lies in - (using options 1, 2 and 3). Grade your interests by giving number 1 to the most interesting target, 2 to the second most interesting target, and 3 to the third most interesting target.
I am most interested in the infrastructure of the railway traffic and issues related to this: the second most interesting topic is freight traffic operations in a competitive market, and issues related to this; the third most interesting topic is maintenance of passenger and freight carriages and locomotives as well as companies providing maintenance and rolling stock. Also opening up the tendering process in the railway traffic, the operations of authorities and regulatory agencies in the tendering process; launching the business of a new railway operator; operating railway traffic in a competitive market – these were topics that interested the participants.

**Open Word**

The open word feedback emphasized that the lecture topic was interesting, and that the participants received new information on the topic. There was a wish expressed that more lectures of this kind would be arranged. The preliminary idea of cooperation between the international partner universities in the EDU-rail project was seen as interesting. The lecturer received positive feedback for his genuine interest towards the topic.

**Annex (In Finnish)**

Hei!
Luento pidetään suomeksi, sillä olemme hankkeessa sopineet, että kaikki pitävät nämä pilottiluennot omalla kielellä.
Aihe on Module HAMKin Theme 1, Market, “The Opening Railway Market”, siis “Rautatiemarkkinat avautuvat kilpailulle”.
Luennon pitää Teppo Sotavalta.

Aikataulun puitteissa teemme lopuksi lyhyen arvioinnin.


Tervetuloa!
Nina Karasmaa ja Teppo Sotavalta
3. Piloting of selected subject of Module 4

Module 4 “Control and Command Systems of Rail Traffic”, Subject 3 “European Rail Traffic Management System ERTMS” lecture was held on Tuesday, March 10, 2018 as a part of the course “Transport Telematics” for second year students of bachelor degree programme “Electronics” of TSI. The target group included the part time students of group 1601 BV. The lecture was given in lecture hall 117 at the Transport and Telecommunication Institute campus. 12 students and 2 representatives from TSI academic staff took part in the lecture. The lecturer was Professor Igor Kabashkin with assistance of engineer Igor Laksa.

At the beginning of the lecture, the goal, tasks, partners and the main activities of the EDU-RAIL project were introduced. The main focus was on presenting the structure and content of Module 4. The subject of the annual lecture was “European Transport Management Systems”. During the lecture, the railway movement organization system was concentrated on. Detailed attention was paid to movement control principles on stages. Special attention was paid to suburban and high-speed movement. A separate section was oriented on train movement organization on stations.

The core topic of lecture was European Rail Traffic Management System. An illustration of the basic principles of railway telematics was demonstrated at the simulator of the railway automatic control system.

Students could, under the guidance of an engineer, perform simple tasks explaining the purpose of various functions of railway telematics systems.

Students had opportunities to see some moves that illustrated different technical processes and operation procedures on railways. Multimedia applications were demonstrated to students using the materials of the e-learning virtual educational environment in Moodle system.
After the lecture, the video presentations and the work with simulator, a general discussion about European Rail Traffic Management System (ERTMS) was held.
4. Piloting of selected subject of Module 5

The subjects about Railway Signalling Manual and Railway Design were chosen to be piloted in simulators as these were the only subjects that could be supplemented and improved with train drivers' simulator.

The methodology and implementation was prepared according to the options and possibilities deriving from the specific simulator. Methodology was chosen so that the given outcomes of the subjects could be reached. Obviously it is not important nor necessary to use options as „train faults“ or other possibilities as they are not related to the subject that is being taught.

The students were prepared for the simulator training about Railway Signalling Manual and Railway Design by giving them an assignment to look the manual through before the simulation as foreseen in deliverable 3.4.1. The assignment to go through the materials previously was given for the students so they would get the basic idea of the signalling principles and while in the simulator, it would visualize the topic and create connections and associations for the students between the real life and the theory that was read. It is unwise and very time consuming to start teaching the signalling manual and railway design principles in the simulator. Also it is not possible for the students to understand the principle of „train driver as the end element of railway system“ without any previous railway education.

The main goals were that the students could get the visualization of the real-life situation on the railway to help them better understand the theory taught in auditory lectures.

The general objectives were met during the piloting. The students accepted the alternative teaching method as opposed to a lecture in an auditorium, very well. The students were eager to try out the simulator themselves and to see how different situations look in real life.

The piloting was done by Martin Kuusk, a railway technology lecturer of TTK. In the Railway Signalling subject, there were 2 students from the first year, and in the Railway Design subject, there were 7 students from the third year.

The general goals, (i.e. to teach the students the subject-topic in real-life alike environment to help the students understand the subject-topic better), were met. The final exam results were better compared to the previous groups and the students managed to form questions on a whole new, more precise and detailed level, showing that they have understood and obtained the material
taught in the simulation. In addition, the students themselves said that the simulation environment helped a lot to understand the topics and it was a nice alternation to a usual auditory lecture.

The only recommendation to give is that the study group for a simulation training should be around 5-6 students per simulator, although the amount should be considered depending on the study group. If the students are very lively and have extrovert personalities, then the study group should be smaller than 5 people.

5. Piloting of the new railway simulators of KRAO

PILOTING SPEISIALIZON MODULES, KRAO FINLAND

Dates: 13.-14.3.2018

Participants: Wladimir Segercrantz TTK
Martin Kuusk TTK
Rita Ojala TTK
Mareks Mezitis RTU
Julia Freimane RTU
Teppo Sotavalta HAMK
Matti Ranta KRAO (simulator instructor)
Hannu Jalonen KRAO

GOAL OF PILOTING, DEFINED IN THE EDU-RAIL CONTRACT PAPERS

To ensure WP 3 and the quality of project outputs, each partner will pilot their specialization module (Selected subject from module to receive valuable feedback for finalizing project).

KRAO has, together with TTK, its own module of simulators.

Steps of piloting process and reporting:

Morning session 9:00 -12:00
- Presentation VET activities in KRAO;
- KRAO’s CEO Timo Tiainen has presentation about Kouvola city

- Presentation of the railway simulators of KRAO:
  1. Selection of piloting subjects by KRAO;
     - driver training procedure in Finland
     - specialized scenarios of each curriculum (KRAO by activity 3.4.1)
  2. Working out methodology and implementation plan for piloting
     - presentation about KRAO management and procedures of driver training
  3. Description of the implementation process
     - see KRAO activity 3.4.1
  4. Feedback from students or trainees *(Questionnaire)*
     - KRAO questionnaire in own chapter
  5. What was learned from piloting of subjects (recommendations for updating) Special case: What was learned during piloting / demonstration of the Railway Simulator in KRAO

**Afternoon session 13:00 – 16:30**

- Demonstration: Use of railway simulators in VET for safety related professions;

- Summary of the day
  - every participant has the possibility to drive KRAO’s simulator - diesel, electric and NANO;
  - all subjects of diver training have been gone through - starting to drive, signalling, specialized events;
  - phone calls and dispatchers announcements are in Finnish (in KRAO).

**Morning session 9:00 -12:00, day 2**

- Special training exercises, including management of emergencies and other situations;
- KRAO’s education planner Merja Pykäri has presentation about KRAO management in driver training and its technical background, OPTIMA facilities for students, students professional guidance (training) card and summary of all tasks.

- W. Segercrantz’s info about topics for participants.

**Afternoon session 13:00 – 16:30;**

- 13:00 – 15:00 Visit to the Training Centre of Finnish Transport Agency / ROK (Hallituskatu 19 Kouvola);
  - EDURail steering group member Janne Tuovinen (Finnish Transport Agency, FTA) show us FTA’s training centre

3/28/2018 Kouvola

Hannu Jalonen
project manager KRAO
Piloting on simulators of KRAO

Outcome of piloting in KRAO

Methodology of use of the railway simulators in KRAO are oriented for VET training. In focus are safety related and train driver's operational simulations. As study programs in RTU, TTK and HAMK are oriented for professional higher education, the results of piloting in KRAO could be used not directly in curricula. At the same time the process of use of railway simulators in KRAO was methodologically well prepared. Demonstration of use of simulators in KRAO highlighted the following aspects, which will be the examples of best practices for curricula:

- It is necessary, that in development or updating content of study modules of EDU-RAIL use of railway simulators as virtual operating environment will be used as exercises for solving practical railway traffic management situations. That will support and enrich the curricula of professional higher education and VET training.

- Cross-study possibilities in the EDU-RAIL partners universities, which were outlined in the final reports, must include demonstration and use of railway simulators in KRAO, TTK, RTU and TSI.

- The main goals were that the students could get the visualization of the real-life situation on the railway to help them understand better the theory given in auditory lectures.

The implemented piloting demonstration and exercise in KRAO gives output for planned activities of the study environment development plan and exploitation plan of results of the EDU-RAIL project.