



Sustainable, safe and
economically feasible
energy concepts and
technologies for
European Inland
Shipping

D 5.16 Evaluation of the Pilot on the CoP on Logistics and Capstone Course

Grant Agreement: 633929
(Sub)Work Package: 5.5
Deliverable No: 5.16
Author: FHOO, IMST, STC
Version (date): November 19, 2017



Document history

Document version (date)	Comments (changes compared to previous version)	Authorised by
0.1 (18 th of October 2017)		Eva Jung
0.2 (31 th of October 2017)	Content revision	Timon Jongkind
0.3 (13 th of November 2017)	Content revision	Eva Jung
0.4 (14 th of November 2017)	Final revision and review	Timon Jongkind
1.0 (19 th of November 2017)	Final Version	Jaap Gebraad

Authors of the document

Responsible organisation	Principle author
FHOO	Eva Jung, Lisa-Maria Putz
IMST	Sorin Savu
STC	Timon Jongkind

DISCLAIMER PROMINENT is funded by the Innovation & Networks Executive Agency (INEA) of the European Commission under the Horizon 2020 Programme. The views expressed in the working papers, deliverables and reports are those of the project consortium partners. These views have not been adopted or approved by the Commission and should not be relied upon as a statement of the Commission's or its services' views. The European Commission does not guarantee the accuracy of the data included in the working papers and reports, nor does it accept responsibility for any use made thereof.

Summary

PROMINENT supports, amongst others, the process of harmonization and modernization of professional qualifications and the stimulation of the further integration of inland waterway transport (IWT) into sustainable transport chains.

Within subworkpackage 4.3 a Community of Practice to further stimulate the integration of inland waterway transport in the bachelor logistics education was developed. The results of SWP4.3 are described in deliverable *D4.3 - Integration of inland navigation in general logistics education*. The elaborated web-based CoP including learning materials and modules on the topic of inland navigation was tested by means of pilots within workpackage 5.5.3. The pilots consist of Train-the-trainer workshops and pilots with students.

During the Train-the-Trainer workshops the participating lecturers experienced the program as an opportunity to get the interest of young people for eco-friendly transport and the role of IWT in that respect. Besides the case studies give a challenging opportunity for the students to work on a joint tasks that really asks for cooperation, role taking, dividing the tasks and striving for the same result. During the pilots with students of different education institutes, the students seemed to be very interested in the topic of eco-friendly transport. They enjoyed the connection of theory and practice in terms of real-life tasks within the case study, study visits at companies and guest lectures by experts from the industry. A difficulty in the learning process was the use of the blog, integrated in the web-based CoP. Students preferred real-time communication with other students or experts, rather than communication via the online blog.

The results from the questionnaire show that students' attitude towards eco-friendly transport modes such as inland waterway transport increased in general after the pilot. Even though there are different results on a country-level, students have a positive attitude towards inland waterway transport in general. They are also very optimistic about the future development of this transport mode.

Different dissemination activities were conducted to foster the use of the web-based CoP in the relevant community and to inform potential users and stakeholders about its existence. Since the field of logistics and IWT is constantly changing and influenced by different trends and developments, the challenges for future professionals are also constantly changing. In fact, logistics education faces the challenge to prepare logistics students for the challenges of tomorrow and should be able to offer training which is relevant for industry. The future use of the CoP could be financed by a business model in order to finance further administrative costs of the web-based CoP and dissemination activities. In the business model it must be organized how the funding will be raised, how students and teachers can use the system and how the system will be maintained.

Table of Contents

- Summary 3
- 1. Community of Practice Integration Logistics education 5
- 2. Train-the-Trainer Workshops 6
 - 2.1. Austria 6
 - 2.2. Netherlands 7
 - 2.3. Romania 7
 - 2.4. Germany 8
 - 2.5 Evaluation of Train-the-Trainer Workshops 9
- 3. Pilots target group 10
 - 3.1. Pilot FHOO 10
 - 3.2. Pilot IMST 12
 - 3.2. Pilot STC Group 13
 - 3.3. Pilot Singapore (FHOO) 14
 - 3.4. Evaluation of Pilots 15
- 4. Sustainability and Market-Uptake of CoP 22
 - 4.1 Short term integration in current study programmes 22
 - 4.2 Long term development and dissemination 23

1. Community of Practice Integration Logistics education

PROMINENT is a multiannual research- and implementation program for the inland navigation industry which is funded by INEA (Innovation & Networks Executive Agency for the European Commission). PROMINENT focusses, inter alia, on supporting the process of harmonization and modernization of professional qualifications and the stimulation of the further integration of inland waterway transport (IWT) into sustainable transport chains.

Within subworkpackage 4.3 involved project partners developed a Community of Practice to further stimulate the integration of inland waterway transport in the bachelor logistics education. The results of SWP4.3 are described in deliverable *D4.3 - Integration of inland navigation in general logistics education*.

The aim of the web-based CoP is to provide adaptable and up-to-date learning material in form of learning modules and a module for trainers to support the handling of the Cop. In addition, a mutual exchange of information and cooperation between the educational sector and the industry involved in inland waterway transport/logistics should be enabled.

The main target group was defined as undergraduate logistics students since they can be identified as crucial future employees in the field of logistics. In addition, students with other school levels (e.g. vocational schools) and stakeholders from the industry were also named as potential target groups. The structure of the capstone course is shown in figure 1.

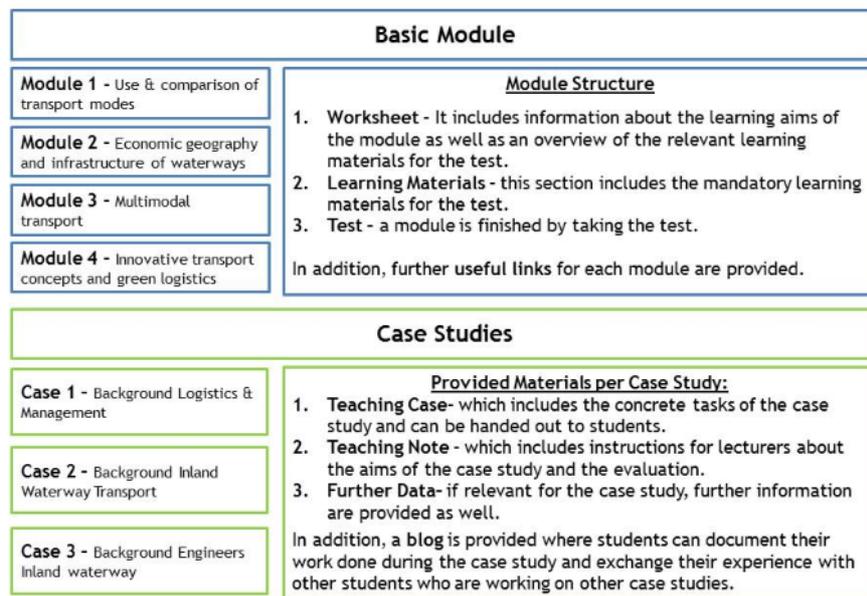


Figure 1: PROMINENT capstone course structure

Within work package 5.5.3 the elaborated web-based CoP including learning materials and modules on the topic of inland navigation was tested by means of pilots. The first step during the pilot phase was conducting Train-the-Trainer-workshops in relevant logistics regions within Germany, Romania, the Netherlands and Austria. These workshops were organised to test and promote the CoP with lecturers. The second step was to conduct pilot courses with students from the target groups in the respective logistics regions. This report describes the conduction of the pilots and the lessons learnt.

2. Train-the-Trainer Workshops

In order to test and promote the web-based Community of Practice (CoP), developed under SWP 4.3, train-the-trainer workshops for logistics teachers, lecturers, professors from vocational schools, upper schools, universities and universities of applied sciences were planned and conducted by involved partners. Due to the partners involved as well as their importance for the IWT sector, workshops took place in relevant logistics regions within Germany, Romania, the Netherlands and Austria. As a first step, relevant logistics regions and logistics education providers within these countries were defined. Relevant logistics regions are areas where IWT transport plays a significant role for the economy.

As a first step, a general structure for the train-the-trainer workshops was developed in order to guarantee that the planned workshops were structured in a similar way. At the beginning of the workshops a general introduction concerning the importance of integrating inland waterway transport in logistics education was given. In addition, the PROMINENT project in general was presented in the first part of the workshops. After the general introduction, the elaborated contents of SWP 4.3. - the web-based CoP including the learning materials and case studies - were presented in more detail. Participants then had the opportunity to discuss the provided content in more detail with the workshop organisers. Qualitative feedback was collected in each train-the-trainer workshop in order to survey areas for further improvement concerning missing topics and materials as well as for the teaching method.

In this chapter, the conducted Train-the-Trainer Workshops organized by the different project partners are described and a summary of the collected feedback is provided at the end of this chapter.

2.1. Austria

In Austria, the Train-the-Trainer workshop was organized at the port of Enns in Upper Austria. The port of Enns is an important trimodal logistics hub in Upper Austria which can be accessed by road, rail and water. With more than 55 companies and more than 2,200 employees the port of Enns is the largest connected industrial area on the Upper Danube. In 2016, the port of Enns accounted for 8.0% of the total volume of goods handled on the Austrian Danube with 596,066 tons.



Figure 2: Train the trainer course in Enns

On the 6th of October 2016 a train-the-trainer workshop was hosted at the port of Enns by FHOO. Teachers from vocational schools, a representative of the Niederrhein Chamber of Commerce and Industry (DE) and project partners attended the workshop. The PROMINENT project was presented as well as the provided materials, content and the online Community of Practice (CoP). Qualitative feedback was collected at the end of the workshop using discussions.

2.2. Netherlands

On the 14th of October 2016 STC-Group hosted the kick-off of a train-the-trainer program for lecturers of Dutch bachelor educations in logistics and transport. During the workshop 12 participants from 7 institutes in the Netherlands attended the presentations and discussions.



Figure 3: Train the trainer course in Rotterdam

In the first part of the workshop the PROMINENT project and other related ongoing projects and activities were presented. This part was very useful for the further collaboration among the lecturers of the different educational institutes.

In the second part of the workshop the participants were able to practice with the developed lesson materials and discuss the opportunities to implement the materials in their learning programmes. During this interactive working method a lot of ideas were shared and discussed among the group of lecturers. These outcomes will be used to further improve and extend the content of the case developed. Besides STC as organizing institute two other institutes were interested in conducting a pilot with their bachelor students.

2.3. Romania

On the 4th of November 2016, IMST also hosted a train-the-trainer workshop at the University of Craiova. Sixteen participants from various education and training institutes (secondary schools, universities), as well as from authorities involved in inland waterway transport sector have attended the event. Professors attended the workshop at which the PROMINENT project, the elaborated Community of Practice (CoP) as well as the pilot course concept was presented. Feedback was collected using a discussion.



Figure 4: Train the trainer course in Craiova

During the workshop three case studies have been presented provided by SC EUROTIRE Manufacturing SRL, a local company, in cooperation with IMST in which a number of 12 students are involved. The virtual international cooperation through Skype meetings and ILIAS e-learning platform between the students from IMST (Romania) and FHOO (Austria) has been pointed out as an effective educational tool. The trainees had the opportunity to work with ILIAS platform which hosts the four existing learning modules.

2.4. Germany

The final train-the-trainer workshop and final transnational event was organized in Duisburg (Germany) on the 10th of October 2017. This location was chosen due to the proximity to the Duisport, the largest trimodal inland hub in Europe. In 2016, 3.7 million TEU were transhipped at all terminals of the Duisport and around 130 million tonnes of cargo in total.¹ The workshop was organized by FHOO in collaboration with Niederrheinische Industrie- und Handelskammer and the Schifferbörse zu Duisburg-Ruhrort e.V. because these organisations are also aiming to integrate the topic of inland waterway transport more in general logistics education, especially in vocational training. In total, 60 participants from industry, politics and education attended the workshop. After an interactive workshop programme in the morning two train-the-trainer workshop were organized for about 10 teachers in German and one for English speaking participants. The PROMINENT project was presented as well as the elaborated materials and the online Community of Practice (CoP). Feedback was collected in terms of discussions in both workshops.

¹ Source: <http://www.duisport.de/en/services/logistic-services.html> [13.11.2017]



Figure 5: train-the-trainer workshop Germany 2/2

2.5 Evaluation of Train-the-Trainer Workshops

During the Train-the-Trainer workshop the feedback from participants was gathered. This input resulted in an overview of useful observations.

Positive aspects and observations were:

- getting the interest of young people for eco-friendly transport and the role of IWT in that respect;
- a challenging case study that asks for cooperation, role taking, dividing the tasks and striving for the same result (consensus);
- understanding the otherwise underestimated role of geography and in geophysical conditions of making complex transport combinations possible (organization, communication, planning);
- the cases studies have a broad scope which might trigger students with different backgrounds and interests: transport and logistics, business economics and finance, construction management or sustainability management.
- different topics - from general to more specific/innovative topics - are covered
- specific data are provided within the case studies which can be used by students, thus they have to learn to use the data in a useful way

The room for improvement can be found in:

- further fine-tuning the case studies (educational materials, expected output) on specific target groups (experienced and motivated students);
- selecting a proper mix of learning objectives, related to skills, competencies and knowledge, which is necessary to integrate in specific curricula;
- combining the case study better with the other, online learning modules within the Community of Practice.
- providing the content in other languages, such as German and Dutch, which makes some target groups more likely to use it;
- elaborating an international case study to guarantee that students have to work together on an international level.

The evaluations were used to further improve the content and process, in order to be well prepared for the different students pilots. Based on the feedback, the case studies were revised by the partners. Other input from the participants of the train-the-trainer workshop will be used for further follow-up projects and to improve the content of the elaborated CoP and to foster the use of the platform.

3. Pilots target group

In the following chapter the pilots conducted by the partners in Austria, Romania and the Netherlands are described. In total, four pilots were conducted in course of the project to test the developed materials within SWP 4.3.

3.1. Pilot FHOO

The case study, developed by FHOO in collaboration with the Austrian agricultural machine manufacturer Pötting, was integrated in the course “transport logistics and infrastructure” from the 3rd semester of the Master programme “Supply Chain Management” at the University of Applied Sciences Upper Austria. The course lasted for 3 months and in total 32 students participated.

Structure of Pilot Course FHOO:

Preparatory phase

Students worked together in groups consisting of 5 to 6 students (students stayed in these groups throughout the whole course) and were assigned to different transport modes (rail, road, air and waterway). The groups had to prepare a presentation including information such as strengths and weaknesses about the different transport modes until the first lecture.



Figure 6: Pilot course FHOO

First lecture - 19th and 20th October 2016

The course concept (grading, tasks,...) was presented to students. Afterwards the presentations from the preparatory phase were presented (~ 10 minutes/group). In addition, a lecture about ‘intermodal transport’ (30 minutes) was included. Afterwards, the Case Studies including instructions were handed out to the groups and shortly described. In total, 6 different case studies were handed out (including PROMINENT case study). On the next day, students had time to ask questions concerning the tasks of the case studies and afterwards they were told to work on their own until the afternoon and to start elaborating a transport strategy as described in the task.

Exchange information with Rumanian students - 2nd November 2016

Students had a Skype meeting with their colleagues from IMST, where they exchanged ideas and information related to the case studies.

Second lecture - 10th and 11th November 2016

At the beginning of the lecture, the groups had to present their transport strategies in plenum including a discussion of their solutions. Afterwards each case study was handed over to another group. Thus, each group had to rely on the work done by the first group for their further elaborations. In addition, the groups were peer evaluated by each other in order to evaluate the work done by the previous group. During the second lecture, a presentation on the topic of air & ocean transport by a representative of the industry was included. Afterwards students had time to prepare a final transport solution based on the proposed transport strategy by the previous group.

Third lecture - 1st and 2nd December 2016

At the beginning of the third lecture, the final transport solutions were presented by each group. A representative of the PROMINENT case company was also present at the final presentations. In addition another representative of the industry was also present. Results were discussed in plenum. At the end students provided general feedback to the course. The final test - including questions elaborated within the learning materials of Task 4.3.1. - of the course (multiple choice test) took place on the 16th December 2016.

Feedback from students at the end of the last lecture suggested that they enjoyed working on a real life case study and to be able to apply their theoretical knowledge on a real issue from industry. They also enjoyed the discussions with lecturers and the representatives of the industry.

3.2. Pilot IMST

The case study, developed by IMST, in collaboration with the tyre manufacturer Eurotire Manufacturing, was integrated in the course "industrial logistics" from the 1st semester of the Master programme "Management of Logistics Systems" at the University of Craiova. The course lasted for 4 months (7th October 2016 - 11th January 2017) and in total 12 students participated.



Figure 7: First lesson pilot course Craiova

Structure of Pilot Course IMST:

Preparatory phase

Students were divided in 3 groups consisting of 4 students (students stayed in these groups throughout the whole course) and worked together to fulfil their tasks.

First Technical Visit and Lecture - 26th and 27th October 2016

The technical visit was made at the company Eurotire Manufacturing in Drobeta Turnu Severin. The visit was hosted by the commercial director of the company and responsible for logistics issues. They presented the manufacture activities and some general data regarding the transport and logistic issues. During the first lecture (after the technical visit), students received three case studies for the transport of different types of tires in different locations. The next day the students were given questionnaires that were filled, and then asked a number of specific questions for each study case.

Self-study

Students had to develop their case study in order to provide best technical solution for transportation of the products in specific locations. They started to prepare a SWOT analysis of different transport modes focused on the technical specs of the tires.

Second lecture - 26th and 27th October 2016

Students have visited the Romanian Naval Authority and the Port of Drobeta. They met with representatives of the two institutions that have Presented elements on river transport and water transport possibilities using existing port capacities. They were asked if they intend to use inland waterway transport as a transport solution of their products.

Exchange information with Austrian students - 2nd November 2016

Students had a Skype meeting with their colleagues from FHOO where they exchanged ideas and information related to cases.

Self-study

Students had to continue developing a transport solution for the case study and to prepare a Power Point presentation for the next lecture.

Third lecture - 11st January 2017

The third lecture included a presentation of the results obtained by each group of students. Since the case studies had been handed out by Eurotire Manufacturing, a representative of the company was also present for the final presentation. A question and answer session was conducted in order to determine the involvement of students in developing the transport strategies. After that, the students filled the second questionnaire. The final test of the course (multiple choice test) took place on the 25th January 2017.

According to the feedback from students, they enjoyed the opportunity to visit a company such as Eurotire Manufacturing. They also mentioned that they would like to have more company visits within lectures in the future. In addition, students prefer to have more interactive exchange with other students such as Skype meetings rather than using a blog.

3.2. Pilot STC Group

In preparation, STC-Group developed an IWT educational program with the help of PTC, a Dutch cooperation of independent entrepreneurs in inland navigation. A case study emerged around the commercial opportunity to write a quotation with underlying proposal for the eco-friendly transport of a completely new hospital somewhere in the Netherlands. Students are provided with a lot of information, including a database with transport orders per construction phase and a generally accepted table with emissions per means of transport. Transport criteria are emissions, number of shipments, distances and costs. From a logistics standpoint, the proposal should elaborate on a smart concept for discharging and loading of materials and goods near the construction site (temporary quay or port with lifting equipment) and multimodal transport planning (combining transport orders with the right construction phase, bundling goods, JIT delivery, etc.). Getting and keeping the overview in the case study and project cooperation between the students are real challenges.

Last winter semester, especially Emmen (four project groups) and Rotterdam (two project groups) applied for the case study pilot. Outcomes were satisfying, yet with room for improvement.

Next school year the case study will be offered again to all Dutch universities of applied science with a logistics department. Confidence is there that the complete PROMINENT learning package will land in Dutch bachelor educational programs.

3.3. Pilot Singapore (FHOO)

FHOO conducted a second (shorter) pilot in course of a summer school organized by the University of Applied Sciences Upper Austria (FHOO) at the port of Enns in Upper Austria. In fact, FHOO is collaborating with the National University of Singapore (NUS) which is also offering a 'Supply Chain Management' master programme.² During a two-week summer school, organized in June 2017, students from NUS had to work on different case studies together with students from the University of Applied Sciences. In total, 16 students participated in this summer school and the pilot - seven students from Austria and nine students from Singapore. The programme also included working on the case study elaborated by FHOO within the PROMINENT project during a two-day workshop. The first day of the workshop included a lecture on the topic of sustainable transport in Europe and Asia. Afterwards students had to conduct a SWOT analysis for the transport modes rail, road and inland waterway transport for Europe and Asia. After a boat trip in the port of Enns and solving a transport challenge using the LEGO-transshipment game the case study elaborated by FHOO was handed out to the students. On the second day, students had time to work on the case study and to elaborate a solution in groups of four students. The groups presented their solutions in plenum to professors from NUS and FHOO. During these two days, the web-based CoP was presented to lecturers from NUS and they are planning to integrate the platform and materials in their lectures.



Figure 8: Pilot with Singaporean students - day 1



Figure 8: Pilot with Singaporean students - day 2

² Link: <http://www.tliap.nus.edu.sg/> [13.11.2017]

3.4. Evaluation of Pilots

In order to evaluate the pilots, a questionnaire was developed which was handed out to students at the beginning of each pilot (observation 1) and the end of each pilot (observation 2). The questionnaire was elaborated based on the Theory of Planned Behaviour in order to investigate the impact of the case study on students' attitude towards eco-friendly transport modes such as inland waterway transport.³ The second questionnaire (observation 2) also included questions to receive feedback on the teaching method, the provided materials and to get qualitative feedback on the pilots. The questionnaires were elaborated by all involved project partners.

In the following chapter an overview of the main results of the questionnaires are presented. The questionnaires are also included in the annex of this report.

Profile of students

In total, 84 students participated in all pilots. The distribution concerning the total number of participants in the different countries or institutions can be seen in Table 1.

Table 1: profile of students - number of participants

	number of completed questionnaires	number of participants
STC (Netherlands)	17	24
FHOO (Austria)	28	32
IMST (Romania)	9	12
NUS (Austria)	9	16
Total	63	84

In average, all participants of the pilots were 24.63 years old. The most students were 24 years old. As can be seen in Table 2 students participating in the pilot organized by STC were the youngest (mean: 21.82 years) whereas students participating in the pilot organized by IMST were the oldest (mean: 28.22 years) in terms of mean values. This may be due to the fact that a high percentage of graduate students in Romania are already employed and are studying part-time.

Table 2: profile of students - age distribution in pilots

	mean	mode	median
STC (Netherlands)	21.82	22.0	22
FHOO (Austria)	24.79	24.5	24
IMST (Romania)	28.22	25.0	23
NUS (Austria)	25.78	25.0	23
All pilots	24.63	24.0	23

³ Source: Thorhauge, M., Haustein, S., Cherchi, E., 2016. Accounting for the Theory of Planned Behaviour in departure time choice. In: Transportation Research Part F: Traffic Psychology and Behaviour 38, 94-105.

In total, 37 male students and 26 female students participated in the pilots conducted within this work package. As can be seen in Table 3 more male students (58.7 %) participated in the pilots than female students (41.3 %). Especially in the Netherlands a high percentage of male students participated in the pilot (88.2 %). More female students participated in the pilot with the Singaporean students (66.7 %).

Table 3: profile of students - overview of gender

	frequency		%	
	male	female	male	female
STC (Netherlands)	15	2	88.2	11.8
FHOO (Austria)	15	13	53.6	46.4
IMST (Romania)	4	5	44.4	55.6
NUS (Austria)	3	6	33.3	66.7
All pilots	37	26	58.7	41.3

Attitude towards eco-friendly transport modes

The following questions were included in the questionnaire in order to evaluate students' attitude towards eco-friendly transport modes such as inland waterway transport:

	strongly agree				strongly disagree		
	1	2	3	4	5	6	7
1) It is very important for me to consider inland waterway transport in transport decisions.	<input type="checkbox"/>						
2) Neglecting inland waterway transport in transport decisions is very unpleasant for me.	<input type="checkbox"/>						
3) It is problematic for me not to consider inland waterway transport in transport decisions.	<input type="checkbox"/>						

Since these questions were included in the first (handed out before the pilot, observation 1) and second (handed out after the pilot, observation 2) questionnaire a comparison of students' attitude before and after the pilot was possible. As shown in Table 4, there is a slight increase in attitude towards eco-friendly transport modes such as inland waterway transport after the pilots. Romanian students had the best attitude towards eco-friendly transport modes such as inland waterway transport before the pilot compared to other pilots. The students of the pilots in the Netherlands had the lowest scores on this topic before the pilot (observation 1). This is despite the fact that inland waterway transport plays a pivotal role in the Dutch transport system. Results increased after the pilot (observation 2) for all pilots except for the pilot conducted in Austria. The reason for this might be that it was very difficult for students to integrate inland waterway transport in the transport strategy which had to be elaborated in course of the case study. The mean values for observation 1 and 2 for all three questions are summarized in Table 5. As can be seen in Table 5, the mean value for the first two questions was better before the pilot (observation 1) than after the pilot (observation 2). Only for question three the results after the pilot (observation 2) has increased.

Table 4: attitude towards eco-friendly transport modes - summarized mean values for observation 1 & 2

	observation 1	observation 2
STC (Netherlands)	3.43	3.25
FHOO (Austria)	3.39	3.74
IMST (Romania)	2.67	1.85
NUS (Austria)	2.70	2.04
All pilots	3.20	3.10

Table 5: attitude towards eco-friendly transport modes - mean values for observation 1 & 2 per question

	question 1		question 2		question 3	
	observation 1	observation 2	observation 1	observation 2	observation 1	observation 2
STC (Netherlands)	3.00	2.82	3.35	3.24	3.94	3.71
FHOO (Austria)	3.00	2.79	3.71	4.46	3.46	3.96
IMST (Romania)	2.22	1.56	3.33	2.22	2.44	1.78
NUS (Austria)	2.11	1.56	3.11	2.33	2.89	2.22
All pilots	2.76	3.37	3.48	3.51	3.37	3.33

The results are in consistent to those of Akengin and Aydenir (2012) who concluded that students' attitude towards environmental issues can be positively influenced by integrating case studies in education.⁴

To sum up the results concerning students' attitude towards eco-friendly transport modes such as inland waterway transport, results show that there is an increase of students' attitude after using the elaborated case studies. Students had the opportunity to learn about the transport mode inland waterway transport in a practical context and were confronted with integrating this transport mode in a sustainable transport strategy. By providing different data, students were able to evaluate the advantages and disadvantages of the different transport modes such as rail, road and inland waterways for a specific real-life situation. Results suggest that students are aware that inland waterway transport is one of the most sustainable transport modes but that there are still some difficulties when integrating this transport mode in transport strategies. This is also reflected by the qualitative feedback, which was provided by students. The qualitative feedback is summarized in the following.

⁴ Source: Akengin, H., Aydemir, G., 2012. Effects of Using Case-Study Method in Social Studies on Students' Attitudes towards Environment. In: International Electronic Journal of Environmental Education 2, 119-127.

Qualitative feedback

In the second questionnaire (observation 2), students were asked about their personal opinion concerning inland waterway transport ("What do you personally think about inland waterway transport?"). The main opinions of students were that inland waterway transport...

- will be more important in the future due to its sustainability, but will not be the most used transport mode;
- is a good option but needs to be planned very good (long delivery time, use full capacity, transshipment);
- is one of the most eco-friendly transport modes and it is safe and efficient ;
- will be important for certain products - high & heavy or not time critical products for example (cannot be used for all products);
- is a good option to counteract congestion of roads;
- is not very much included in education ("... I am introduced to inland waterway transport for the first time...");
- has less regulations/restrictions than road transport and should be more used as part of the transport system.

These results show that students recognize inland waterway transport as an eco-friendly transport mode but that it is difficult to integrate it efficiently in transport systems. Students are aware of the advantages and disadvantages of inland waterway transport but are still optimistic about the future - various students mentioned that they believe that inland waterway transport will still be important in the future. However, inland waterway transport will only be relevant for certain products or industries.

Feedback

In total, sixteen questions were included in the second questionnaire (observation 2) in order to receive feedback on the provided materials, the structure of the pilot course and the used teaching method. The following questions were included in the questionnaire, which were answered by students using a 7-point-Likert Scale, ranging from strongly agree (value 1) to strongly disagree (value 7):

1. The course was very effective at helping me reach the defined learning objectives.
2. It was clearly explained what I was expected to learn.
3. The overall structure of the course was clear.
4. The course was easy to use in a technical way.
5. The course was very engaging.
6. The website(s) and the provided materials were visually attractive.
7. The course was very interesting for me.
8. The level of difficulty of the course was too high.
9. The value of this course for my future career is very high.
10. I enjoyed participating in the course.
11. The interaction with other students was very helpful in getting new insights for the case study.
12. The amount of material provided was very helpful in solving the case study.
13. The interaction with experts from the industry was very helpful in solving the case study.

The mean values for these questions are summarized in Table 6. Results show that overall the learning objectives were clearly explained and that it was clearly explained what students were expected to learn. The structure of the course was also clear for students (question 1-3). However, in the Netherlands the students were somewhat undecided when answering these three questions. This may be because of the flexible setting of the pilot course conducted in the Netherlands- students had to screen all the provided information in order to define which information of the case study is relevant and which information is not relevant. This is also consistent with the results of question 12 (mean: 3.37): since students were only provided with some data and some general information about the different transport routes in the case studies, they had to conduct a desktop research to get further information. Thus, they evaluated the amount of provided material as somewhat helpful for solving the case studies.

Concerning the user friendliness of the web-based CoP (question 4) the opinions were different in the three pilots. Whereas students participating in the pilots organized by STC think that the web-based CoP is not easy to use in a technical way (mean: 4.18) students participating in the pilots organized by FHO and IMST think that the web-based CoP is easy to use in a technical way (mean: 2.96 and 1.56). This may be due to the fact that there wasn't a standardized process to present the web-based CoP to students. Thus, it would be useful to introduce students to the web-based CoP in plenum at the beginning of a course in order to answer questions and to discuss the functions of the web-based CoP. This could also be done via a Skype meeting if possible.

In total, all students participating in the pilots found the course very engaging (question 5, mean: 2.63). Especially the Singaporean students enjoyed the interactive setting of the two-day workshop (mean: 1.33). This result shows, that the elaborated case studies may not only be implemented in courses which last a semester or longer but also in workshops where students only have a limited time (e.g. one day) to elaborate a solution. However, the tasks would need to be adapted.

The visual presentation of the web-based CoP and the provided learning materials was evaluated as somewhat good (question 6, mean: 3.03). This may be due to the limited visual editing options within ILIAS. Even though it is possible to edit the text and to include interactive elements, editing options are limited compared to other websites.

Students found the course very interesting and enjoyed participating in the pilots (question 7, mean: 2.7 and question 10, mean: 2.48) which is consistent with the qualitative feedback presented in the last section of this report. The level of difficulty was not too high for students (question 8, mean: 4.03) which may lead to the assumption that the tasks within the case study could be more difficult or that less time could be provided to solve the tasks within the case studies. This may also mean that the current case studies could be used by other educational institutes such as vocational schools. The value of the pilots for the later professional life of students was evaluated somewhat positive (question 9, mean: 3.29). Especially Romanian and Singaporean students evaluated the content of the pilots very useful for their future career. Dutch and Austrian students were more critical and agreed somewhat that the pilot was important for their future career. This is also consistent with the qualitative feedback since students said that inland waterway transport is only relevant for a certain industry or product. If they are not involved in such industries, they may not be confronted with this transport mode in their future career and they do not think it is necessary to deal with this transport mode.

Concerning the teaching method, students preferred the interaction with experts (question 13, mean: 2.44) more than the interaction with other international students (question 11, mean: 2.49). This result shows that students prefer a link between practice and theory and like to get more insights in practice. Students from Austria and Romania also enjoyed the exchange via Skype more than the exchange of results via the blog, which is integrated on the web-based CoP. Thus, more Skype

meetings should be integrated when working on the case study in the future. The blog integrated in the web-based CoP could then be used as a platform to find other universities which are planning to integrate a case study in their lecture. Also experts from the industry could be included via Skype meetings if they are not able to attend lectures.

Table 6: feedback from students (mean values)

	question												
	1	2	3	4	5	6	7	8	9	10	11	12	13
STC (Netherlands)	4.06	4.65	3.94	4.18	3.65	3.76	3.88	3.71	4.94	3.47	3.18	3.76	4.18
FHOÖ (Austria)	2.57	2.71	2.39	2.96	2.79	3.61	2.79	5.07	3.21	2.64	2.75	4.21	2.54
IMST (Romania)	1.44	1.33	1.22	1.56	1.56	1.22	1.44	2.33	1.89	1.11	1.67	1.44	1.33
NUS (Austria)	1.33	1.56	1.56	0.00 ⁵	1.33	1.67	1.44	3.11	1.78	1.44	1.22	1.89	0.00 ⁵
All pilots	2.63	2.87	2.52	2.67	2.63	3.03	2.70	4.03	3.29	2.48	2.49	3.37	2.44

In addition, two open questions were included in the second questionnaire (observation 2) to get further feedback concerning the pilot design. The questions and the main results are summarized in the following table.

“What was the best thing about the course?”	“Do you have any suggestions how we could improve the course for the next semester?”
<ul style="list-style-type: none"> • Get insights in practice and input from experts • Case studies drawn from real-life problems of companies (real data, complex tasks) • Exchange of learnings with other students • To learn about the importance of sustainability and inland waterway transport • Working independent in groups in order to solve the case studies 	<ul style="list-style-type: none"> • Provide more theoretical input and more detailed information • Integrate more skype meetings (in combination with blog) • More input from practice (guest lectures, study visit)

⁵ This question was not included in the questionnaire since the setting of the summer school was different than the other pilots.

Evaluation of web-based CoP

In addition to the feedback provided by the results of the questionnaire, the web-based CoP was also tested by a graduate logistics student from the University of Applied Sciences Upper Austria in order to get detailed feedback. The tests provided at each learning module of the web-based CoP were conducted two times - first without going through the provided learning materials and a second time after going through the learning materials. The following main findings were drawn from the feedback which was provided concerning the the web-based CoP:

- The structure of the web-based CoP is clear concerning the four learning module;s
- The level of difficulty of the tests was quite high since a lot of text had to be read - thus the time limit of 15 minutes was too short to read all questions in detail;
- After going through the learning materials it was easier to answer the questions included in the test but still the time was very short;
- The test includes very specific questions of the learning materials - it seems that the aim of the tests is to ask for specific information and not to have a common understanding of the topic of each learning module. This is also caused by the fact that in the web-based environment only fixed-answer questions could be used;
- Some of the provided information are relatively old which means that they have to be updated to guarantee a certain level of actuality.

Based on the feedback the time limit for the test was set to 20 minutes. In order to guarantee the actuality of the provided learning materials a regular revision of the content would be necessary in certain time periods. The section "useful links" in each learning module may be used to add current relevant information which would be less effort compared to updating all provided learning materials. Since the platform can be adapted and further questions can be added to the tests, as a next step the question pools can be adapted in a more general manner or tests with different levels of difficulty could be included on the web-based CoP.

Summary and Lessons learnt

In summary, the pilots were successfully conducted by all partners and students enjoyed participating in the pilots. The pilots have shown that inland waterway transport is not much included in higher logistics education but students are interested in learning more about this eco-friendly transport mode. In fact, students seemed to be very interested in the topic of eco-friendly transport. In addition, students enjoyed the connection of theory and practice in terms of real-life tasks within the case study, study visits at companies and guest lectures by experts from the industry. However, it was difficult to motivate students and experts from the industry to use the blog integrated in the web-based CoP during the pilots. Students also preferred Skype as a medium for communication with other students or talking to experts from industry in person or via telephone, because they were provided with information in real-time and did not need to wait for a response in the blog. Thus, for further pilots it would be better to include more Skype meetings and to invite experts from industry to attend lectures to facilitate discussions. As the results from the questionnaire show, students' attitude towards eco-friendly transport modes such as inland waterway transport increased in general after the pilot. Even though there are different results on a country-level, students have a positive attitude towards inland waterway transport in general. They are also very optimistic about the future development of this transport mode.

4. Sustainability and Market-Uptake of CoP

Different dissemination activities were conducted to foster the use of the web-based CoP in the relevant community and to inform potential users and stakeholders about its existence. The activities conducted are described in deliverable *D4.3 - Integration of inland navigation in general logistics education*.

Since the field of logistics and IWT is constantly changing and influenced by different trends and developments, the challenges for future professionals are also constantly changing. In fact, logistics education faces the challenge to prepare logistics students for the challenges of tomorrow and should be able to offer training which is relevant for industry. Consequently, the developed web-based CoP should be updated sooner or later. This evaluation report of the pilots and train-the-trainer workshops should be used as a starting point for further measures and discussions.

4.1 Short term integration in current study programmes

IMST, STC and FHOO are planning to integrate the developed case studies within the lectures on a long-term basis. FHOO already included the developed case study in the pool of case studies in the lecture 'transport logistics & transport infrastructure' of the master programme 'Supply Chain Management'. However, in Romania and the Netherlands it is difficult to include the developed learning materials and the capstone course concept in the curriculum due to administrative barriers. Nevertheless, IMST and STC are in contact with other universities and professors which are able to integrate the elaborated case studies and learning materials in elective courses. In the following study programmes the Community of Practice will be integrated:

- Exchange programme 'Logistics and Transport Management' - Rotterdam University of Applied Sciences
- Master programme 'Supply Chain Management' - University of Applied Sciences Upper Austria, Campus Steyr
- Master programme 'Management of Logistics Systems' - University of Craiova, Romania

4.2 Long term development and dissemination

The long-term goal is that the web-based CoP is used as a source for learning materials on the topic of inland waterway transport which can be integrated in logistics education. In addition, the blog should be used for all sorts of issues and discussions on the topic of inland waterway transport by different stakeholders from industry, research and education. An exchange of information and know-how as well as discussions should be enabled by the web-based CoP. The elaborated content should be integrated in general logistics education in Europe in order to raise awareness for inland waterway transport and equip the future logistics students with knowledge about this sustainable transport mode.

It will be a primary task of teachers and researchers to keep the attention of companies related to inland waterway logistics and transport to the web-based CoP. Students and assistants-to-the-teacher, as future employees in the logistics industry, will act as a link between teachers, researchers and companies. They can open up discussions on interesting and actual topics, keep these discussions alive, disseminate outcomes and results via the web-based CoP and develop new learning modules after stakeholder workshops/discussions/surveys.

The future use of the CoP could be financed by a business model in order to finance further administrative costs of the web-based CoP and dissemination activities. In the business model it must be organized how the funding will be raised, how students and teachers can use the system and how the system will be maintained. The following roles are necessary in this business model:

- Administrator
This role has the ability to maintain the system and give the necessary users their access.
- Users
The users are the students and teachers and possible other stakeholders who have access to the CoP to learn, teach and create new content. The can also be used for promotion, dissemination and train-the-trainer pruposes.
- Funding organisations
Different stakeholders could financial contribute to the system, such as educational institutes, IWT and logistics companies and governmental organisations.

The costs of the system are the costs to conduct the administrator role. This consists of the salary of the administrator and hosting costs of the online CoP. The costs could be covered by a fee per user and/or by funds from additional stakeholders, such as IWT and logistics companies and governmental organisations.

Due to the experience gained in the development process of the web-based CoP, FHOO, IMST and STC can function as experts for the development of new learning materials and the further development of the web-based CoP.

Further measures to guarantee the long-term use of the web-based CoP and the elaborated learning materials will be defined in *SWP 6.4 'Policy recommendations and draft implementation roadmap'* of the PROMINENT project and will be included in the corresponding report.