



Digital Education Readiness in Maritime and Inland Navigation

REPORT ON TRAIN THE TRAINER SESSIONS

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LIST OF ABBREVIATIONS

Abbreviation	Definition
AR	Augmented Reality
AVC	Advanced Video Coding
BA	Breathing Apparatus
CABA	Compressed Air operated Breathing Apparatus
CEDEFOP	European Centre for the Development of Vocational Training
CEFR	Common European Framework of Reference for Languages
CER	CERONAV – Romanian Maritime Training Centre
CESNI	European Committee for drawing up Standards in the field of Inland Navigation
CMINET	Course Manuals for Inland Navigation Education and Training
COVID-19	Coronavirus disease 2019 caused by the SARS-CoV-2 virus
Danube SKILLS	Increased institutional capacity in Danube navigation by boosting joint transnational competences and skills in education and public development services
DERIN	Digital Education Readiness in Maritime and Inland Navigation
DeriNetwork	Network of maritime and inland waterway trainers which aims to share knowledge and cooperation between professionals in the field of digital training and to promote relevant practises across Europe
E&T	Education and training
ES QIN	European Standard for Qualifications in Inland Navigation
EU	European Union
EWITA	European Web Platforms and Training Concepts for Intermodal Inland Waterway Transport
FE	Fire Extinguisher
FPZ	Faculty of Transport and Traffic Sciences of University of Zagreb
HINT	Harmonized Inland Navigation Transport through education and information technology
HMT	Head Mounted Tablet
IMO	International Maritime Organization
IMO MC	IMO Model Courses
ISRBC	International Sava River Basin Commission
IWT	Inland Waterway Transport

IWTCOMP	Competency Based Inland Waterway Transport Education & Training
LMA	Latvian Maritime Academy
MAH	Maritime Academy Harlingen/ Stichting Dunamare Onderwijsgroep
MOK	Maritiem op Koers
MP4	Moving Picture Expert Group-4
MQC-TUV	Maritime Qualification Center, Technical University of Varna
NELI	Cooperation network for logistics and nautical education focusing on Inland Waterway Transport in the Danube corridor supported by innovative solutions
OECD	Organisation for Economic Cooperation and Development
PROMINENT	Promoting Innovation in the Inland Waterways Transport sector
RELAR	Remote learning and examination by using AR in maritime VET education
ROCSTAR	Remote Operations, Coaching and Skills Training using Assisted Reality
ROI	Return On Investment
SBK	Schiffer-Berufskolleg Rhein
STC	Stichting STC-Group
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
TTT	Train the Trainer (course for Inland Navigation Education and Training)
VET	Vocational Education and Training
VR	Virtual Reality
VTS	Vessel Traffic Services
WBL	Work-Based Learning

1. INTRODUCTION

Within the DERIN project, Train the trainer sessions were organized in order to increase the impact of the outcomes of the project for education and training institutions. They followed the organizational and institutional structure and the acquisition of skills and competences by the coordinator/ CERONAV and other education and training institutions within the project consortium.

Furthermore, the Recommendation of the European Parliament and of the Council of 18th December 2006 on key competences for lifelong learning (2006/962/EC) outlined digital competence as a fundamental competence in the future, with following definition: "*Digital competence involves the confident and critical use of Information Society Technologies (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet.*"

The outputs developed in OI 1 T1.3 **Development of multimedia learning materials (curriculum, teaching methods, procedures, role-play scenarios, videos etc.) for practical activity development** coordinated by MQC-TUV, that is, multimedia learning materials for practical activity development as essential tools for trainers will be used in OI 1 T1.4 **Train the Trainer & Assessor session**, two TtT sessions held at MQC-TUV and LMA to demonstrate their efficiency.

The main objective of this task was to prepare teachers/trainers in the shipping sector to work effectively and efficiently with innovative multimedia learning materials and technologies, especially during the COVID-19 crisis, still complying with the requirements in STCW as amended and ES-QIN 2020.

To this end the 2 (two) train-the trainer sessions intended to transfer **knowledge** (basic concepts of virtual and augmented reality, design features and principles of operation of VR/AR devices, basics of working with platforms for creating VR/AR content), **ability** in the operation of VR systems, in importing modules into the VR/AR development environment, and creation of virtual and augmented reality applications and **skills** in using VR/AR devices, creating/operating applications with immersive content of two IMO model courses: ***Ship Simulator and Bridge Teamwork - Familiarization with the Bridge*** (Model Course 1.22) and ***Engine Room Simulator - Familiarization with the Engine*** (Model Course 2.07) were organized. The IMO model courses were used, as there have not been developed such specialized courses for inland navigation, yet.

The two train the trainer sessions were preceded by an online demonstration (due to COVID restrictions) of how to conduct such an activity on ***Fire Prevention and Fire Fighting – Use of breathing apparatus for fighting fires*** (IMO Model Course 1.20, points 3.17 and 3.18). The demonstration was carried out by CERONAV team a few months in advance.

The first **Train the trainer session on *Ship Simulator and Bridge Teamwork - Familiarization with the Bridge* was organized in Varna, Bulgaria, between 22nd – 24th November 2022.**

An Agenda for full 5-day train the trainer activity was designed, adapted to the new conditions: in the first 2 days the activities were held online.

Here is the Agenda of the **online sessions that took place on 16 and 17 November 2022**. The sessions were moderated by the trainers at MQC and all project partners joined the **Google Meet** sessions as a link was sent well in advance.

Day 1, 09:00 – 17:00	
09:00 – 12:00	Welcome and introductions Participants self-introduction Introduction to the Train the Trainers' Session content and plan for the online and practical sessions Objectives of the training session
12:00 – 12:30	Stretch your legs
12:30 – 15:00	Overview of Train the Trainers' Toolkit for Capacity Building / Competency Tables/Short presentation of STCW and ES-QIN Understanding Digital competences
15:00 - 17:00	E-learning Methodologies and good practices - Analysing Learning Needs - Understanding and organising E-learning content in maritime and inland navigation education and training - Designing and delivering e-learning solutions; Instructional and Evaluation Methods Practical activity: short practical activities during the course to practice with e-learning content, giving each other feedback, self-reflection and progress on the given topic/scenario; training scenarios Discussions and conclusions
Day 2, 09:00 – 17:00	
09:00 – 12:00	Theory- Applying VR and AR technologies in education and training - Creation of multimedia learning material - Learning and training outcomes - Basic competences for applying VR/AR technologies Familiarization with the VR headset and the Warp e-learning platform Learning how to use digital tools (filming, editing video, scenario flow) using a VR device and the appropriate teaching and training methods and aids – practical activities; training scenario: Familiarization with the Bridge as part of train the trainer development
12:00 – 12:30	Stretch your legs
12:30 - 17:00	Select and use the appropriate scenarios for using VR headset. Learning module scenario flows Practical activity: short presentations to practice module scenario flows, giving each other feedback, self-reflection and progress on the given module/scenario Discussions and conclusions Feedback

The second **Train the trainer session on *Engine room Simulator - Familiarization with the Engine*** was organized in Riga, Latvia, between 21st -23rd February 2023.

A preparation online meeting with all project partners was organised by CERONAV on February 7th.

It was followed by the online Train the Trainer sessions held on February 16th and 17th 2023. Trainees studied at their own pace all the materials that were made available for this part of

the Learning Teaching Training activity. There was a clear focus on lessons learnt during the first TtT session held the previous year.

2nd Train the Trainer AGENDA

Date:

online: 16 and 17 February 2023

Host: RTU –LMA

Co-organisier: CERONAV

Online & individual study Day 1 – 16 February <i>Individual study at own availability and pace</i>	
Topic	Responsible
<p>Lessons plan and learning goals/ objectives defined previously and shared with everybody – for clear results – for Riga</p> <ul style="list-style-type: none"> • Individual study of the latest version of the Handbook - All PPs – to prepare any questions for the meeting in Riga - RTU-LMA to prepare information for chapter regarding their scenario in Warp VR • All participants were added in Warp VR platform as writers so they can prepare their own flow chart <p>Log in to https://www.warpvr.com/</p> <ul style="list-style-type: none"> • Every partner organization to choose at least one lesson from their usual teaching activity that could be suitable to be switched to VR environment and draft the learning objectives to be presented during the Train the Trainer session in Riga 	<p>All participants</p> <p>RTU-LMA</p>
Online & individual study Day 2 – 17 February <i>Individual study at own availability and pace</i>	
Topic	Responsible
<ul style="list-style-type: none"> • Individual study of the flow chart model prepared by CER (<i>Creating a VR scenario</i> PPT to be shared by Dragos/ CER) • In order to be able to prepare a lesson plan in Warp platform during meeting in Riga, every partner organisation makes a scenario on a topic of their choice • A module/ A lesson participants usually teach will be selected. Evaluation questions should also be included Recommendation: each partner organisation to work and deliver about 10 cards (minimum 4-5 cards presenting information and 3-4 cards for evaluation) <p><i>Types of cards on the platform:</i></p> <ul style="list-style-type: none"> - Information - Multiple choice - Hotspot - Direction <p><i>Feedback on the platform (in stars):</i></p> <ul style="list-style-type: none"> - Great job! All the choices you made were spot on. You got the best possible score. > 9 points = 5 stars 	<p>All participants</p> <p>CER: Dragos & Liliana for flow chart model</p>

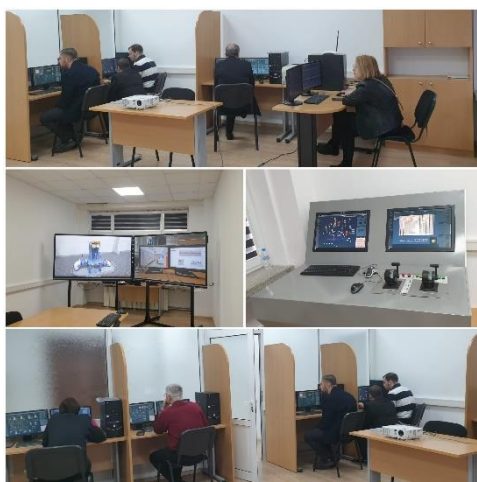
- *Well done! Almost everything you did was spot on. Try again to get the best possible score. 8 - 9 points = 4 stars*
- *Good job, although some choices you made could have been better. Please try again. 6 - 7 points = 3 stars*
- *The choices you made were not good enough. Just try again and see how you can improve. 4 - 5 points = 2 stars*
- *Only 1 star. That means a lot of the choices could be better. But no worries, you can try again to improve! < 4 points = 1 star*

2. ROLE OF INVOLVED PARTNERS

Organization and execution of the Train the trainer sessions were coordinated by CER on account of its adequate expertise and extensive experience in training activities. The development of the Train-the trainer sessions has however equally involved all responsible PPs for these activities. The involved PPs contributed with information on national regulations so as to allow both transnational and national approach on delivery of the training courses. During the train the Trainer sessions both trainers and trainees were taught how to use the innovative multimedia training concept (VR glasses) in practical training. The main objective of the TtT sessions was to prepare teachers/trainers in the shipping sector to work effectively and efficiently with innovative multimedia learning materials and technologies, especially during the COVID-19 crisis, still complying with the requirements in STCW as amended and ES-QIN 2020 and to increase learning and the potential for growth within teachers and students

Based on the deliverables developed in T1.3 “*Development of multimedia learning materials*” (curriculum, teaching methods, procedures, role-play scenarios, videos etc.) for practical activity development, LMA and MQC-TUV as activity leaders drafted the structures of these TTT sessions.

MQC-TU organized and hosted the first Train the trainer session: *Ship Simulator and Bridge Teamwork - Familiarization with the Bridge* in Varna, Bulgaria as MQC-TU (Maritime Qualification Centre) possesses adequate practical training bridge simulator for performance of practical training exercises on the simulator.



LMA experts hosted and organised the ***Engine room Simulator - Familiarization with the Engine*** Train the Trainer session in Riga, Latvia as RTU–LMA possesses modern engine room simulator and practical training facilities for performance of practical training exercises using VR glasses.

All project partners (STC, MQC-TU, RTU –LMA, CER, FPZ and ENS) attended the two Train the Trainer sessions, with internal/external qualified experts with former experience in inland, maritime navigation, logistics and aviation and having actively contributed to the development of subject transnational tools.

LMA, MQC and STC assigned the most experienced employees of their organisations as experts involved in this activity to attend the Train the Trainer courses and share their knowledge and skills with fellow trainers in their subject institutions.

3. EVALUATION REPORT ON THE TRAIN THE TRAINER SESSIONS

3.1 Train the trainer session on “Ship Simulator and Bridge Teamwork - Familiarization with the bridge”

3.1.1 General considerations

Train the trainer session for “***Ship Simulator and Bridge Teamwork - Familiarization with the bridge***” was hosted by MQC-TU (Maritime Qualification Centre) in Varna, Bulgaria, It was based on the internal procedures for deployment of safety training courses and on the learning materials such as: IMO Model course curriculum, Course compendium, didactical movies, presentations, VR glasses to demonstrate their efficiency. Activity 3.2- Development of new transnational innovative learning tools and associated implementation method and on the existing practical facilities and equipment – VR Glasses purchased from the project budget.

All these learning materials composed the **course package** which was studied carefully by the trainer as well as by the trainees before attending the Train the trainer session for a clear understanding of what is required for the successful implementation of the training course.

The learning materials which were handed to the trainees, before the course began, were the following:

1. *Introduction to the Train the Trainers’ Session content and plan for the online and practical sessions;*
2. *Train the Trainers’ Toolkit for Capacity Building / Competency Tables/Short presentation of STCW and ES-QIN*
3. *Theory- Applying VR and AR technologies in education and training*
4. *Familiarization with the VR headset and the Warp e-learning platform*
5. *E-learning Methodologies and good practices*
6. How To Use Your Oculus Quest 2! (Complete Beginners Guide)
https://www.youtube.com/watch?v=H54z6irBs_0
7. Oculus Quest 2 Unboxing, Setup and Review on
<https://www.youtube.com/watch?v=ve2hbZdbO-I>
8. Augmented Reality (AR) and Virtual Reality (VR) Explained on
<https://www.youtube.com/watch?v=h3rKvsFTfPA>

These learning materials were sent in .pdf format and in electronic editable version to all involved partners and to all trainees.

Once such a “course” was created, based on the learning materials for model course ***Ship Simulator and Bridge Teamwork - Familiarization with the bridge***, it was publicly available on DERIN website.

The provision of these learning materials and the practical training session could help trainers to improve the quality of their existing courses by introducing new innovative techniques and enhance their effectiveness in meeting the requirements of the STCW as amended and the new EU Directive 2017/2397 on the recognition of professional qualifications in inland navigation and also of the Standards for competence for inland navigation personnel, which will be part of this legislative act.

For the course to run smoothly and to be effective, considerable attention was paid to the availability and use of:

- properly qualified trainers;
- support staff;
- class-rooms, bridge simulator and other spaces;
- VR headsets and other equipment;
- practical facilities;
- teaching aids;
- other reference materials.

The Train the trainer session was delivered in the English language and all the didactical materials handed to the trainees were elaborated in English language.

3.1.2 Scope

The Train the trainer session was organized in order to transfer best practices in online training activities of inland navigation personnel using innovative techniques – VR glasses - from MQC-TU to the responsible PPs involved in this activity.

3.1.3 Objective

The main objective of this training session was in line with the involvement of the responsible partners of project consortium in training activities, through their relevant representatives, and especially on the Trainer job function for which the participants were trained, specifically ***to familiarise trainees with the layout of the bridge and console, where the different instruments and controls (main console, navigational instruments, lights and sounds, radar, overhead panels, conning, ECDIS, and GMDSS) are located and how to operate them.***

Training of future trainers from all project partners Danube countries is supporting education and training institutions and their teaching staff in organizing and introducing new training courses based on the new EU Directive 2017/2397 on the recognition of professional qualifications in inland navigation and on the Standards for competence of inland navigation personnel which will be part of this EU Directive, adopted by CESNI.

On the other hand, this Train the trainer session intended to transfer knowledge and competences to the future trainers which will be involved in creating innovative training materials using latest technology – VR headsets - , where the quality and effectiveness of the training courses may thereby be improved and be designed and developed in a harmonised way according to the provisions of STCW and the EU Directive 2017/2397 on the recognition

3.1.4 Planning of Train the Trainer session development

The Train the trainer session had a total duration of 32 hours, from which 20 hours for practical training.

The Train the trainer session organized in Varna, Bulgaria between 22nd and 24th November 2022 and was focused mainly on the practical applications and in this respect the theoretical part was only taken as a review.

Before starting the TTT session, trainees were asked to download the Oculus app for iOS or Android. To do this, participants had to sign in with a Facebook account.

The Train the trainer session programme for practical training on **Ship Simulator and Bridge Teamwork - Familiarization with the bridge** was the following:

Train the Trainer - practical session Timetable

Date: 22nd – 24th November 2022

Time: 09.00 – 17.00 EEST

Host: MQC-TU (Maritime Qualification Centre)

Venue: 1 Studentska str., 9000, Varna, Bulgaria

Purpose: IO1 – T1.4 Train the Trainer - practical session

DAY 1 - 22 nd November 2022		
	Topic	Practical training duration (hours)
	Welcome and introductions. Participants self-introduction	0.5
	Introduction to the Train the Trainers' Session content and plan Objectives of the training session	0.5
	Creating E-Learning Content <ul style="list-style-type: none"> The Process of Content Development Using Instructional Techniques for Content Development Courseware Development 	2.5
	<ul style="list-style-type: none"> Practical activities: <ul style="list-style-type: none"> ➤ Creating E-Learning Content ➤ Short presentations of the pre-task e-learning content for a module/ scenario, giving each other feedback, self-reflection and progress on the given module/scenario content Discussions 	4.0
DAY 2 – 23 rd November 2022		
	<ul style="list-style-type: none"> Practical activities - practical demonstrations of scenarios using VR device on "Familiarization with the Bridge" <ul style="list-style-type: none"> ➤ Familiarization with the layout of the bridge and console. ➤ Coastal scenario - practical experience of handling the ship ➤ Restricted-water scenario 	3.0
	<ul style="list-style-type: none"> Practical activities - practical exercise of developing scenarios using VR device on "Familiarization with the Bridge" Discussions and conclusions 	4.0

DAY 3 – 24 th November 2022		
	<ul style="list-style-type: none"> • Practical activities - practical demonstrations of scenarios using VR device on “Familiarization with the Bridge” <ul style="list-style-type: none"> ➤ Harbour scenario ➤ Wind and current effects ➤ Anchoring and single-buoy mooring 	3.0
	<ul style="list-style-type: none"> • Practical activities - presentation of scenarios developed by trainees using VR device on “Familiarization with the Bridge” • Feedback and comments 	4.0
	Evaluation of the Training Session	0.5
	Total	20

3.1.5. Training session development

The theoretical part of the training session was carried out in the form of individual study, each partner and each participant in this training session receiving the entire **course package** documents (teaching, reference materials) in due time in order to become familiar with the content of the course and with the competence requirements.

The practical part of the training session was organized in the **Training Campus of MQC-TU (Maritime Qualification Centre) located in Varna, Bulgaria** by using the existing practical facilities, bridge simulator, devices, equipment etc. and also the VR glasses purchased from the project budget and mentioned in the project AF and in the course curriculum for each learning module.

The practical training consisted in various practical scenarios developed by the trainer assigned for this training session. The trainees were involved actively in all the practical exercises in order to acquire the competencies mentioned in the course curriculum.

Organization issues

Petar Gembeshev/MQC-TU - welcomed the participants in the first Train the trainer session, introduced himself and his team and **presented** the training programme for this training session.

Next, Petar Gembeshev asked the participants to introduce themselves mentioning the specific experience in the field of inland waterway transport.

Each trainee received a file with documents, including: scenarios presentations and Safe working practices and procedures document with the main important aspects of the deployment of Train the trainer session and block notes.

All the participants brought their VR glasses with them and then were instructed on working practices and procedures for practical applications so that they could be safely deployed.

The trainer presented the main important aspects regarding the safety precautions during the practical exercises, identified and explained the exercises risks and corresponding emergency responses, location of equipment and medical staff including telephone numbers and the importance of using Tool Box Safety check lists prior to task commencement.

Day 1

The trainer started the training session with the content, plan and objectives of the training session and pointed out the applicable legislation that would only be considered for work on board of inland vessels in order to operate according to rules of safety at work, such as ISM

Code - International Safety Management Code, Quality Management System, National regulations in the field of health and safety working conditions.

In addition to this, the Trainer presented various images with hazards, accidents and fatal errors on board of inland vessels pointing out that images of injured persons have a major influence on crew members in the sense of complying with safety of work procedures and raising the awareness for safety, thus stressing the importance of introducing innovative technologies (VR, AR glasses) on board vessels.

The trainer's recommendation for the future trainers:

- Show your trainees what has to go well, as a motivational technique and positive psychology. Only if necessary and only after assessing the experience of your trainees, you could also present what can happen when things go wrong in order to avoid fear of failure and create passive and defending leadership. It is good to raise awareness but not by being afraid of what can happen.
- to use Personal Protective Equipment as didactical material in order to understand the correct wearing and the importance of wearing them for the safety of life.
- to learn and master how to use AR/VR glasses in order to help enrich their teaching and training methods.
- share good practices to stimulate a growth and positive mindset for exploration of new tools and more efficient, effective, innovative methods to work and prevent incidents from happening

Before starting the practical application in the Bridge simulator using the VR glasses, the Trainer presented a toolbox talk meeting for short briefing of trainees about the exercise that will be performed. Also, the trainer specified that the presentation of concepts and methods can be repeated in a variety of ways, as needed, until the trainer was satisfied that the trainee achieved each specific learning objective. The syllabus was structured in terms of learning objectives and each objective stated what the trainee had to be able to do as a learning outcome. Next, the trainer presented the frequent errors that may lead to incidents, near-misses, or accidents during work on the bridge and also all necessary stages for performance of all tasks on the bridge, all the time pointing out the benefits of using VR glasses.

For the practical training in the bridge simulator using VR glasses, trainees were split in 3 groups and each group created an exercise scenario that was checked and examined by the trainer. Before starting the activity, all requirements were briefly discussed and explained. After the pre-check of the scenario and applied corrections, the exercise was loaded into the simulator for full performance. This operation was done by a designated designer and the senior trainer as a supervisor, all the remarks occurred during the exercise were discussed and corrections were made to achieve all the goals.

During the exercises, the trainer monitored and controlled the target vessels (target planers), the trainees at work, recorded the exercise, and prepared a summary for debriefing.

The Assessment Tool Software Module was used to log the trainer's work during the ongoing exercise. All his data were used later in the debriefing for the purpose of analysis.

When conducting the exercises, the trainer pointed out that of utmost importance is that the initial course and speed be exact and well established before the manoeuvre begins. Otherwise, the results cannot be compared with other data from the same manoeuvre. He proposed, if possible, some of the manoeuvres be performed by two vessels, one with a fixed pitch propeller and one with a controllable pitch propeller. At least one manoeuvre should be repeated with the loaded and the ballasted vessel to demonstrate the difference in behaviour.

During the debriefing which lasted 25 - 30 per cent of the total time spent on simulator exercises, the trainer referred to the summary made during the exercise, raised important points and guided the discussion among the trainees. He avoided imposing his own opinion but ensured that the trainees always felt safe to learn, able to reflect on their own performance and to discuss and use correct procedures. Each working group gave short presentations of the pre-task e-learning content for the module/ scenario, giving each other feedback, self-reflection and progress on the given module/scenario content.

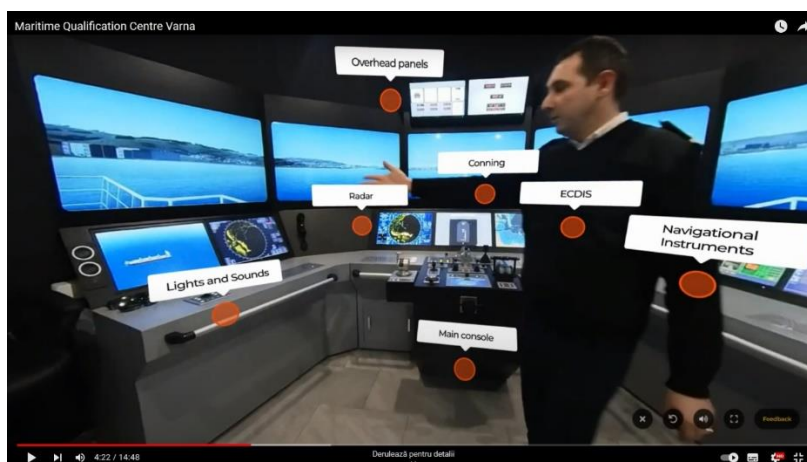
Day 2

The training session continued with the three practical activities - practical demonstrations of scenarios using VR device on "Familiarization with the Bridge":

- *Familiarization with the layout of the bridge and console.*
- *Coastal scenario - practical experience of handling the ship*
- *Restricted-water scenario*

and because the train the trainer session was mainly focused on the practical applications, the trainer presented some organizational issues regarding the existing facilities and equipment in the Training campus which will be used for the practical demonstrations using VR headsets.

In the first part of the day the Trainer, the coordinator of the activity, shortly presented the theoretical part of this activity to provide the necessary theoretical background for the exercises. Particular items dealt with in these lectures were illustrated by including them as part of a practical exercise and by a separate simulator demonstration on the scenario "Familiarization with the layout of the bridge and console" using VR headset.



The exercises were controlled by the instructor and, initially, allowed the trainees to become familiar with the equipment, the controls and the instrumentation provided by the simulator as well as with the VR headset.

During the first part of the training, participants were shown how to use the VR headset to demonstrate:

- the operation of the different bridge instruments,
- the uses of the rudder and engine controls

Next, all present trainees executed practical exercises in the Bridge simulator on a scenario in the port of Sidney using the VR headsets.

The "Coastal scenario - practical experience of handling the ship" was carried out for the familiarization exercises using the VR headsets. They were designed to make the trainees familiar with the bridge layout and equipment and to allow them some initial hands-on

experience in handling the ship using the VR headset. The manoeuvring trials were made using the coastal scenario in the port of Sidney, and included an area in which shallow-water manoeuvres can be conducted.

Next, the “*Restricted-water scenario*” started where the coastal scenario ended and gradually became narrower. The scenario ended at the Sidney harbour scenario. The restricted-water scenario contained a traffic separation scheme (TSS) and a vessel traffic service (VTS).

During exercises the instructor was responsible for monitoring and sailing the target ships, recording the exercise and making a summary for the purposes of debriefing. Trainees were expected to target ships and act in compliance with COLREG 1972, and the instructor controlled the target ships accordingly and helped the trainees in using the VR headsets accordingly.

After the exercises were completed, the debriefing session took place during which participants took responsibility for assessing actions and results of decisions made during the training session.

Day 3

The third day of training began with Feedback, additional questions and comments from the part of trainees regarding the previous 2 days of training followed by the trainer’s conclusions.

The day continued with other practical activities - practical demonstrations of scenarios using VR headset on “Familiarization with the Bridge” on:

- *Harbour scenario*
- *Wind and current effects*
- *Anchoring* and single-buoy mooring

First, the Trainer shortly presented the theoretical part of this practical activity to provide the necessary theoretical background for the exercises on the 3 scenarios mentioned above. The 3rd-day session continued with the coastal scenario in the port of Sidney, and included an area with wind and current effects.

The trainer first showed the participants how to use the VR headset to perform the following actions:

- repeat a standard manoeuvre with wind and current present for the loaded condition
- repeat the manoeuvre with wind and current present for the ballast condition
- record times, positions, headings, speed and other relevant data
- plot the manoeuvres from the recorded data

After trainees carried out these tasks, being permanently monitored and advised by the trainer, they were split in groups to compare and discuss the results obtained and various aspects observed.

Once all the three Train the trainer sessions and the assessment of the trainees during practical applications were completed each trainee received a Certificate of Attendance and an online Evaluation questionnaire in order to complete it with personal feedback regarding:

- Trainee’s information;
- Content of the TTT sessions;
- Expert coordinator attitude and behaviour;
- Trainer attitude and behaviour;
- Content of the scenarios;

- Time allocated to the training session;
- Trainees' expectations;
- Comments/suggestions.

Based on the filled in questionnaires, Trainer consolidated the information in a Synoptic table of evaluation questionnaires of trainee's satisfaction.

In a rate of 90% the trainees were satisfied with the Train the trainer sessions on "Familiarization with the Bridge".

In the end of the TTT session the Trainer thanked the trainees for their constructive and interactive participation and concluded that the 3-day session was a learning interaction between trainer and trainees because he received a lot of new information from the trainees regarding using VR headset and scenarios in maritime sector and the fact that it can be successfully applied in inland waterway transport sector, too.

3.1.6. Recommendations for execution of TTT sessions in project partner countries

Selection of the teaching staff

Each responsible partner had the responsibility to assign one or more trainers from trainers prepared during Train the trainer session in Varna, Bulgaria and/or from training expert group of each partner organization or from maritime and/or inland vocational schools in their countries.

One of these trainers will be designated as **course co-ordinator** with the entire responsibility of the organization and development of training courses in using VR headsets.

All the trainers assigned for the train-the trainer session will be involved in theoretical and practical training activities and they must:

- 3.1.6.1. be holders of the graduation certificate of the Train the trainer session;
- 3.1.6.2. be trained and qualified in assessment techniques;
- 3.1.6.3. have a good understanding of English language;
- 3.1.6.4. have professional experience in the simulator, in navigation and safety practices during ship operation;
- 3.1.6.5. holders of a certificate of professional competency recognized by national/international authorities.

The trainers responsible for implementing the training courses should consider monitoring the quality of teaching in such areas as variety and form of approach, relationship with trainees, and communicative and interactive skills.

Extra assistants may be available for practical applications developed in the bridge simulator, and the training campus. They must be familiar with all practical sessions being conducted, as well as with the operation and use of VR headset and scenario flow chart so as to be able to prepare required equipment, materials and scenarios. They should be properly briefed on their duties including the actions in the event of an emergency when using the VR glasses.

Teaching facilities and equipment

All the training facilities and equipment mentioned in the individual study will be made available before starting the training activities and a pre-operational inspection will be carried out checking for damages or any hazardous conditions, of all the training equipment.

If any are found, the training course will not start until the problem is solved. Project partners who are not directly involved in the education and/or training in maritime and inland navigation will cooperate with maritime universities and inland vocational schools in their country and will also use for practical application purposes the facilities and equipment available in these vocational schools as well as the didactical movie made before the Train the trainer session in Varna which presents the practical exercises to be executed during the training course on “Fire-fighting” using a VR headset.

3.2. Train the trainer session on “Engine-Room Simulator - Familiarization with the Engine”

3.2.1 General considerations

Train the trainer session for “Engine-Room Simulator - Familiarization with the Engine” was hosted by Riga Technical University - Latvian Maritime Academy (RTU –LMA) as planned since the university possesses modern engine room simulator and practical training facilities for performance of practical training exercises using VR glasses. The session was based on the internal procedures for deployment of safety training courses and on the learning materials such as: IMO Model course curriculum, Course compendium, didactical movies, presentations, VR glasses to demonstrate their efficiency. Activity 3.2- Development of new transnational innovative learning tools and associated implementation method and on the existing practical facilities and equipment – VR headsets purchased from the project budget. All these learning materials composed the **course package** which was studied carefully by the trainer as well as by the trainees before attending the Train the trainer session for a clear understanding of what is required for the successful implementation of the training course.

The learning materials which were handed to the trainees, before the course began, were the following:

1. *The latest version of the Handbook “Train the Trainers’ Toolkit for Capacity Building”*
2. *Description of scenario flow chart in Warp VR*
3. *Model on how to develop a scenario on a topic*
4. *Theory- Applying VR and AR technologies in education and training*
5. *E-learning Methodologies and good practices*
6. *Training with Warp VR on <https://www.warpvr.com/>*

These learning materials were sent in .pdf format and in electronic version to all involved partners and to all trainees and after the completion of the training session were posted on the website.

After being created, based on the learning materials for model course **Engine-Room Simulator - Familiarization with the Engine**, it was made publicly available online here: <https://app.warp.studio/p/f1f6c1c7dbe329d82581bd4c>

The provision of these learning materials and the practical training session could help trainers to improve the quality of their existing courses by introducing new innovative techniques and enhance their effectiveness in meeting the requirements of the STCW as amended and the new EU Directive 2017/2397 on the recognition of professional qualifications in inland navigation and also of the Standards for competence for inland navigation personnel, which will be part of this legislative act.

For the course to run smoothly and to be effective, considerable attention was paid to the

availability and use of:

- properly qualified trainers;
- support staff;
- class-rooms, bridge simulator and other spaces;
- VR headsets and other equipment;
- practical facilities;
- teaching aids;
- other reference materials.

The Train the trainer session was delivered in the English language and all the didactical materials handed to the trainees were elaborated in English language.

3.2.2 Scope

The Train the trainer session was organized in order to transfer best practices in training activities of maritime and inland navigation personnel using innovative techniques – VR glasses - from Latvian Maritime Academy (RTU –LMA) in Riga to all the project partners involved in this activity.

3.2.3 Objective

The main objective of this training session was in line with the involvement of the responsible partners of project consortium in training activities, through their relevant representatives, and especially on the Trainer job function for which the participants were trained, specifically ***to familiarise trainees with the VR simulators, on the other hand, use head-mounted displays, motion controllers, haptic feedback, and spatial audio, which enable the users to experience a more natural and engaging interaction with the virtual reality and the engine room.***

Training of future trainers from all project partners countries is supporting education and training institutions and their teaching staff in organizing and introducing new training courses based on the new EU Directive 2017/2397 on the recognition of professional qualifications in inland navigation and on the Standards for competence of inland navigation personnel which will be part of this EU Directive, adopted by CESNI.

Utilizing VR headset in engine room simulators can bring a number of advantages for both trainees and instructors. VR can improve learning outcomes and retention as learners can practice and apply their knowledge and skills in a more realistic and immersive environment, which can stimulate motivation, curiosity, and creativity. Additionally, VR can increase safety and efficiency since trainees can become familiar with the layout, equipment, and procedures of the engine room without any risk or damage. Moreover, VR can make learning more accessible and affordable since trainees can access the simulators from anywhere at any time using portable and low-cost devices such as smartphones and/or VR headsets.

On the other hand, this Train the trainer session intended continue transferring knowledge and competences to the future trainers which will be involved in creating innovative training materials using latest technology – VR headsets - , where the quality and effectiveness of the training courses may thereby be improved and be designed and developed in a harmonised way according to the provisions of STCW and the EU Directive 2017/2397 on the recognition of professional qualifications in inland navigation.

3.2.4 Planning of Train the Trainer session development

The Train the trainer session had a total duration of 32 hours, from which 20 hours for practical training.

The second Train the trainer session was organized in Riga, Latvia between 21st and 23rd February 2023 and was focused mainly on the practical applications and in this respect the theoretical part was only taken as a review.

Before starting the TTT session, trainees were asked to download the Oculus app for iOS or Android. To do this, participants had to sign in with a Facebook account.

The Train the trainer session programme for practical training on **Engine-Room Simulator - Familiarization with the Engine** was the following:

2nd Train the Trainer - AGENDA

Date: 21-23 February 2023

Time: 09.00 –16.00 EEST

Host: RTU –LMA

Co-organisier: CERONAV

Venue: Riga, LV

Day 1 – 21 st February 2023		
	Welcome and presentation of participants	0.25
	Presentation of host organisation	0.25
	General presentation of the project and the TTT session schedule, scope and objectives	1.0
	Detailed presentation of VR material prepared by RTU-LMA <i>1. Preparation, starting and synchronization for diesel generators</i>	2.0
	Questions/ comments/ feedback on RTU – LMA material	0.5
	<i>Visit to Freeport of Riga (field activity to demonstrate how to use VR glasses in port)</i>	2.0
Day 2 – 22 nd February 2023		
	Review of Day 1 Plan of Day 2 – <i>Participants to be split into 2 working groups</i>	0.5
	Creating a VR scenario – demonstration	0.5
	VR lessons – How to prepare a flow chart as a Teacher/Trainer: Presentation of scenario flowchart Group 1: <i>Preparation and starting of boiler</i>	1.0
	Presentation of scenario flowchart Group 2: <i>Main engine preparation and starting</i>	1.0
	Questions/ comments/ feedback	0.5
	<i>Visit of host organisation – Latvian Maritime Academy – training simulators, fish freeze-drying laboratory, workshop – demonstration how VR headset can be used in these facilities</i>	3.0
	Questions/ comments/ feedback	0.5
Day 3 – 23 rd February 2023		
	Practical activity to improve and diversify the prepared material following the problems/ issues encountered by each participant. Both working groups – practical activity directly in the VR platform with different types of transitions/ cards (as per information shared for online individual study)	4.0
	Feedback questionnaire Google form to be filled in by all participants List of Participants to be signed by all and then signed and stamped by host organisation Participation certificates to be handed out by host organisation	2.5
	Questions/ comments/ feedback Wrap-up & closure	0.5
	Total	20

3.2.5. Training session development

The theoretical part of the training session was carried out in the form of individual study, each partner and each participant in this training session receiving the entire **course package** documents (teaching, reference materials) in due time in order to become familiar with the content of the course and with the competence requirements.

The practical part of the training session was organized in the **Training Campus of Latvian Maritime Academy located in Riga, Latvia** by using the existing practical facilities, engine room simulator, devices, equipment etc. and also the VR glasses purchased from the project budget and mentioned in the project AF and in the course curriculum for each learning module. Familiarization with the Engine room – scenario using VR devices and discussions.

The practical training consisted in practical scenarios exercises: Creation of a VR scenario by trainees on a topic they are familiar with; Work on Engine room simulator scenario developed by the trainer and assigned for this training session, followed by discussions and recommendations: outcomes, obstacles, advantages and disadvantages of the equipment used, etc.

The practical session included working with the software needed for the project. A briefing on how to use the INSTA360 app on an Android device was performed between LMA, CER and FPZ. The briefing was focused on how to choose the right settings for filming such as speed, resolution and size. Different possibilities were tested in order to find the optimal setup. The trainees were actively involved in all the practical exercises in order to acquire the competencies mentioned in the course curriculum.

Organization

Maksims Vorobjovs and Aija Rautmane from LMA - RTU welcomed the participants in the second Train the trainer session, introduced themselves and their team and **presented** the training programme for this training session.

Next, Maxims Vorobjovs asked the participants to introduce themselves mentioning the specific experience in the field of inland waterway transport and their expectations for this second TTT session.

Each trainee received a file with documents, including: scenarios presentations and Safe working practices and procedures document with the main important aspects of the deployment of Train the trainer session and block notes.

All the participants brought their VR glasses and laptops with them and then were instructed on working practices and procedures for practical applications so that they could be safely deployed.

The trainer presented the main important aspects regarding the safety precautions during the practical exercises, identified and explained the exercises risks and corresponding emergency responses, location of equipment and medical staff including telephone numbers and the importance of using Tool Box Safety check lists prior to task commencement.



Day 1

The trainer started the training session with the content, plan and objectives of the training session and pointed out the applicable legislation that would only be considered for work on board of maritime and inland vessels in order to operate according to rules of safety at work, such as ISM Code - International Safety Management Code, Quality Management System, National regulations in the field of health and safety working conditions.

In addition to this, the Trainer focused on safety of work procedures and raising the awareness for safety, thus stressing the importance of introducing innovative technologies (VR, AR glasses) on board vessels. The trainer's recommendation for the future trainers were quite similar to those in the first train the trainer session.

Before starting the practical application in the Engine room simulator using the VR glasses, the Trainer presented a toolbox talk meeting for short briefing of trainees about the exercises that will be performed. Next, the Trainer presented the scenario developed by his team for the project, presenting the obstacles encountered. Also, the trainer specified that the presentation of concepts and methods can be repeated in a variety of ways, as needed, until the trainer was satisfied that the trainee achieved each specific learning objective. The syllabus was structured in terms of learning objectives and each objective stated what the trainee had to be able to do as a learning outcome.

For the practical training in the Engine room simulator using VR glasses, trainees were split in 2 groups and each group created an exercise scenario (flowchart) on the following topics: 1. *Preparation and starting of boiler*; 2. *Main engine preparation and starting*. After the working groups finished the flow chart of the respective scenario, they were checked and examined by the trainer. Before starting the activity, all requirements were briefly discussed and explained. After the pre-check of the scenario flow charts the 2 groups worked to apply corrections, and finish the flow charts in order to be presented the following day. All the remarks occurred during the exercise were discussed and corrections were made to achieve all the goals.

During the exercises, the trainer presented and demonstrated the benefits of using VR glasses in engine room simulator as well as the challenges and barriers that need to be addressed. Technical issues such as low resolution, latency, frame rate drops, or hardware failures can affect the quality and reliability of the VR headsets. Additionally, it can cause physical and psychological effects like motion sickness, eye strain, fatigue, or disorientation.

Furthermore, the users must possess certain skills and competencies to use the VR technology or the engine room environment.

Next, the trainer prepared a summary for debriefing.

The Assessment Tool Software Module was used to log the trainer's work during the ongoing exercise. All his data were used later in the debriefing for the purpose of analysis.

During the debriefing which lasted 25 - 30 per cent of the total time spent on simulator exercises, the discussion and reflection among the trainees were facilitated by the trainer, who added his points when important points were raised. He avoided imposing his own opinion but ensure that the trainees always use safe and correct procedures. Each working group gave short presentations of the pre-task e-learning content for the scenario flowchart, giving each other feedback, self-reflection and progress on the given module/scenario content.

Day 2

The training session continued with a presentation from the part of the trainer regarding inside-out and outside-in tracking explaining that these are two different approaches to motion tracking in the real world to replicate them in virtual reality:

- *Inside-out tracking* uses the sensors placed inside of the VR. The cameras on the headset will record fixed points in your real surroundings and use as reference points for our movements.
- *Outside-in tracking* uses an external tracking system (with cameras or lighthouses) to simulate the “virtual box” where the user is. It is very accurate but doesn't track anything outside the line of sight of the sensors.

Then he emphasized the fact that scenarios can be played to all major mobile VR platforms, with apps for mobile phones, tablets VR headsets and computers.

Next, each group of trainees presented the flowchart developed the previous day. These were:

1. *Preparation and starting of boiler;*
2. *Main engine preparation and starting*

Because the train the trainer session was also focused on the practical applications, the trainer presented some organizational issues regarding the existing facilities and equipment in the Training campus which will be used for the practical demonstrations using VR headsets.

After each group of trainees presented their products, the trainer explained that they will try to load their flowcharts in Warp VR app, then they will select normal or high video quality by preference, and click on Download scenario to download it to their mobile phones. After the scenario is downloaded, trainees have to click on Start scenario. Before doing this, all trainees installed the Warp VR app on their mobiles.

After the exercises were completed, the debriefing session took place during which participants took responsibility for assessing actions and results of decisions made during the training session.

Day 3

The third day of training began with Feedback, additional questions and comments from the part of trainees regarding the previous 2 days of training followed by the trainer's conclusions.

The day continued with an overview of all practical activities followed by clarifications to improve and diversify the prepared material following the problems/ issues encountered by

each participant.

All working groups finalized their scenario flowcharts on the Warp VR platform using different types of transitions/ cards (as per information shared for online individual study)

After trainees carried out these tasks, being permanently monitored and advised by the trainer, they were split in groups to compare and discuss the results obtained and various aspects observed.

Next, the trainees discussed about the advantages and disadvantages of virtual reality. One advantage is that virtual reality can create a simulated environment. For example, you could use it to create a virtual world where you can explore anything you want without worrying about the real world. This can be very useful for training purposes or for people who want to experience things they wouldn't normally be able to. Another advantage is that virtual reality can increase productivity. As an example, the DERIN project was mentioned, that requires a lot of focus, so the participant can put on the virtual reality headset and work in a simulated environment (engine room) that is free from distractions. This can help any participant get more done in less time. Another advantage of VR is its ability to provide an immersive experience. When using a VR headset, trainees stated that they could feel as though they were actually in the environment (engine room) they were seeing. This can be helpful for training purposes or for experiencing things that would otherwise be too dangerous or uncomfortable.

Once all the three-day Train the trainer session and the assessment of the trainees during practical applications were completed each trainee received a Certificate of Attendance and an online Evaluation questionnaire in google forms. The consolidated summary of the feedback is presented in Chapter 4. FEEDBACK SURVEY AND ANALYSIS OF EVALUATION.

In the end of the TTT session the Trainer thanked the trainees for their constructive and interactive participation and concluded that the 3-day session was a learning interaction between trainer and trainees because he received a lot of new information from the trainees regarding using VR headset and scenarios in maritime and inland waterway transport sector.

3.2.6. Recommendations for execution of TTT sessions in project partner countries

Selection of the teaching staff

Each responsible partner had the responsibility to assign one or more trainers from trainers prepared during Train the trainer session in Riga, Latvia and/or from training expert group of each partner organization or from maritime and/or inland vocational schools in their countries.

One of these trainers will be designated as **course co-ordinator** with the entire responsibility of the organization and development of training courses in using VR headsets.

All the trainers assigned for the train-the trainer session will be involved in theoretical and practical training activities and they must:

- be holders of the graduation certificate of the Train the trainer session;
- be trained and qualified in assessment techniques;
- have a good understanding of English language;
- have professional experience in the simulator, in navigation and safety practices during ship operation;
- holders of a certificate of professional competency recognized by

national/international authorities.

The trainers responsible for implementing the training courses should consider monitoring the quality of teaching in such areas as variety and form of approach, relationship with trainees, and communicative and interactive skills.

Extra assistants may be available for practical applications developed in the bridge simulator, and the training campus. They must be familiar with all practical sessions being conducted, as well as with the operation and use of VR headset and scenario flow chart so as to be able to prepare required equipment, materials and scenarios. They should be properly briefed on their duties including the actions in the event of an emergency when using the VR glasses.

Teaching facilities and equipment

All the training facilities and equipment mentioned in the individual study will be made available before starting the training activities and a pre-operational inspection will be carried out checking for damages or any hazardous conditions, of all the training equipment. If any are found, the training course will not start until the problem is solved. Project partners, directly involved in the education and/or training in maritime and inland navigation, as maritime/ transport faculties and inland vocational schools in their country and will also use the didactical movie made before the Train the trainer sessions which presents the details on “Fire-fighting” module using a VR headset.

4. FEEDBACK SURVEY AND ANALYSIS OF EVALUATION

Two main Train the Trainer sessions took place during the project, one in Varna, with 11 participants (10 answers received) and one in Riga 12 participants (9 answers received).

Certificates of attendance were issued for each participating organisation, mentioning the names of the participants. A detailed questionnaire was created to collect feedback from the participants in the two Train the Trainer sessions organised as planned in the Application Form. For the session in Varna, with 11 participants, 10 answers were received and for the session in Riga, with 12 participants, 9 answers were received and consequently analysed.

The feedback to the two LTT/ Learning Teaching Training activities is compared below in a table with 2 columns, first for Varna and the second for Riga, according to the chronological roll-out of activities.

The information is compared not only to present the consolidated feedback but to have an overview of the changes brought about by the training and the progress of the participants both in terms of knowledge and behaviour.

Links to the applied surveys in Google forms

Varna:

<https://docs.google.com/forms/d/e/1FAIpQLSfDPzOw79uFNAabyOq5Xt1HFKW4MvdK52Mn78WPjSeqPatk w/viewform>

Riga:

<https://docs.google.com/forms/d/e/1FAIpQLSfG9oL8TuZwz4vAR 8vEjpfzwTTd55mapYLrRSD2djy1c3A2A/viewform>



Evaluating the Train the Trainer event in Varna, Bulgaria

Varna, Bulgaria, 22-24 November 2022

Organized by the Technical University of Varna in collaboration with Maritime Qualification Center, Varna

Thank you for your participation!

Please fill in this quick survey and let us know your thoughts. Your feedback will help us improve our following events.

DERIN - Digital Education Readiness in Maritime and Inland Navigation

<https://www.derinnet.eu>

<https://www.linkedin.com/showcase/derin-network/>



Evaluating the Train the Trainer event in Riga, Latvia

Riga, Latvia, 21-23 February 2023

Hosted by Riga Technical University - Latvian Maritime Academy

Thank you for your participation!

Please fill in this quick survey and let us know your thoughts. Your feedback will help us improve our following events.

DERIN - Digital Education Readiness in Maritime and Inland Navigation

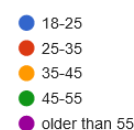
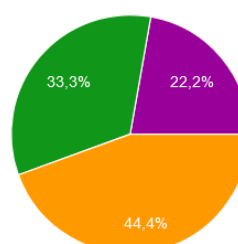
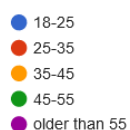
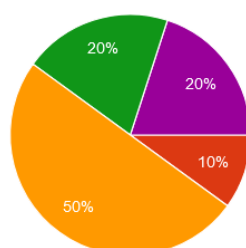
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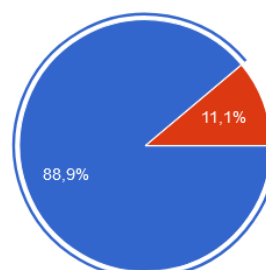
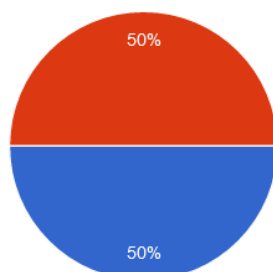
Questions and (compared) answers are below:

1 ST LTT activity in VARNA	2 ND LTT activity in RIGA
---------------------------------------	--------------------------------------

1. Age



2. Have you already had VR training before?



One of the main differences, as the event in Riga was the second session within the project, is that only 11% of the trainees, specifically one person had not had VR training previously, compared to 50% of the participants in Varna.

3. What kind of VR training and which topic?

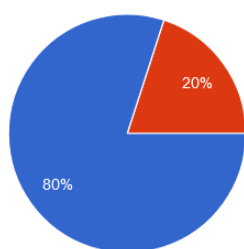
VARNA:

- Warp VR and training in the container crane VR
- Introduction of VR and Digital Education Readiness in Maritime and Inland Navigation
- OCULUS Quest equipment and environment, using WARP platform and AR
- Familiarization with platform and technical equipment
- Familiarity with the Navigational Bridge of a Ship

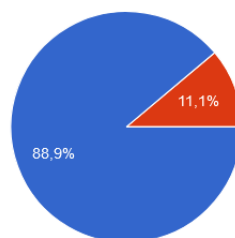
RIGA:

From those who had previous VR training, 4 participants mentioned the first Train the Trainer session (in Varna) and the internal workshops within DERIN project, 1 familiarization with VR glasses, 1 similar training with WarpVR, 1 immersive VR training about the use of fire-fighting equipment, 1 VR awareness in aviation and 1 bridge simulation.

4. When did this training take place?

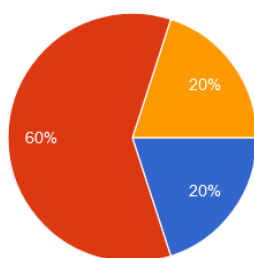


● Less than a year ago
 ● Between 1 and 2 years ago
 ● Between 3 and 4 years ago
 ● More than 4 years ago

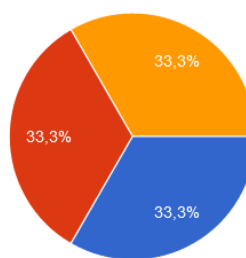


● Less than a year ago
 ● Between 1 and 2 years ago
 ● Between 3 and 4 years ago
 ● More than 4 years ago

5. Before starting the VR training, I knew what to expect.



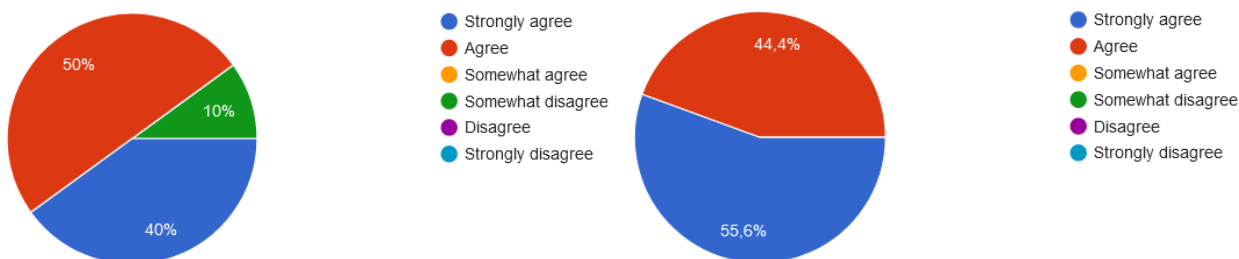
● Strongly agree
 ● Agree
 ● Somewhat agree
 ● Somewhat disagree
 ● Disagree
 ● Strongly disagree



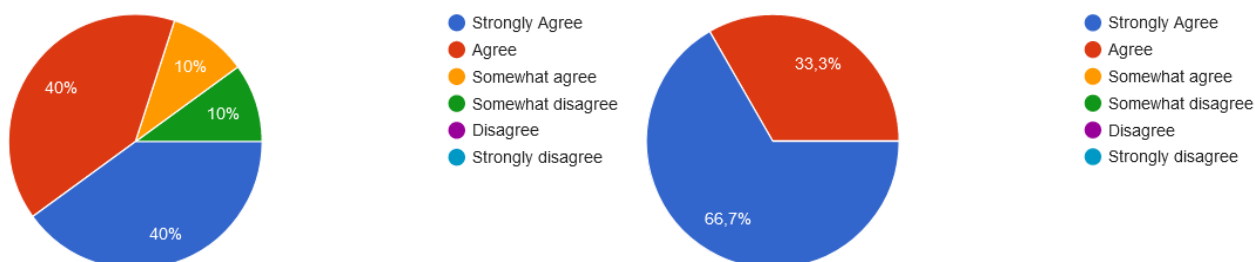
● Strongly agree
 ● Agree
 ● Somewhat agree
 ● Somewhat disagree
 ● Disagree
 ● Strongly disagree

All those who had training before stated that it had taken place less than one year before the one in question. They also knew what to expect, although in different degrees, as per figures above.

6. The content of the VR training met my expectations.

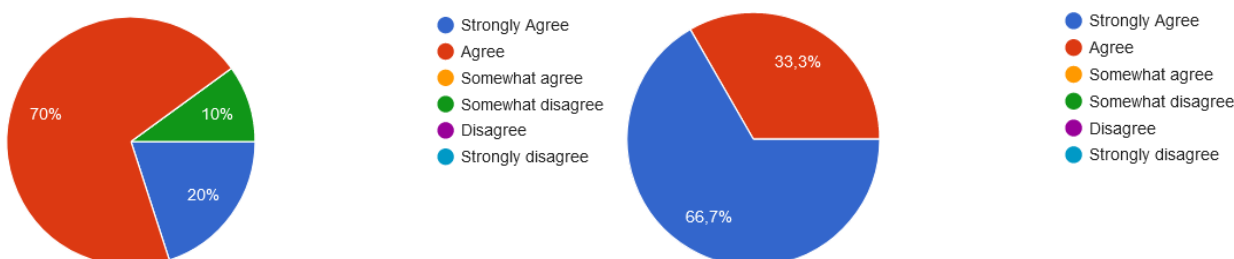


7. The way the VR training was presented met my expectations.

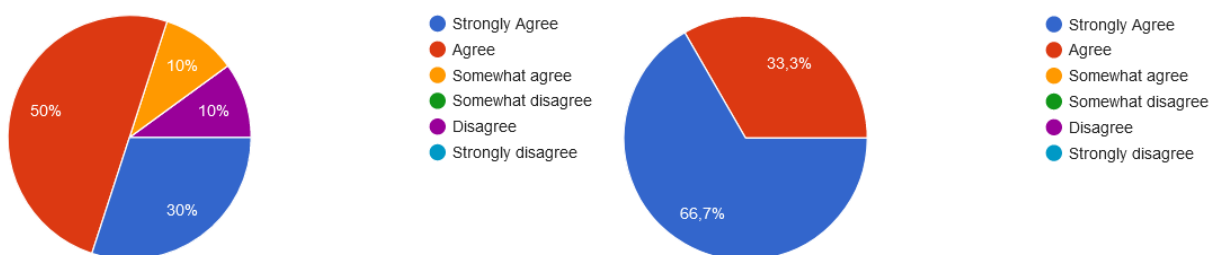


One can easily see the improvement regarding expectations being met, proof to lessons in the first activity having been learnt.

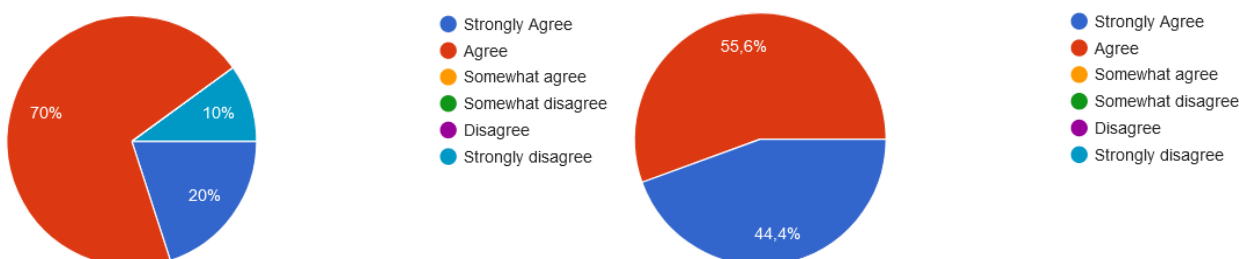
8. I find this VR training a pleasant way of learning.



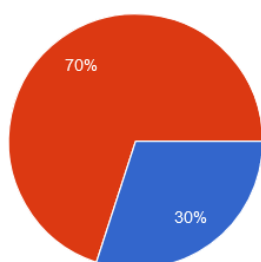
9. The structure of the VR training was clear.



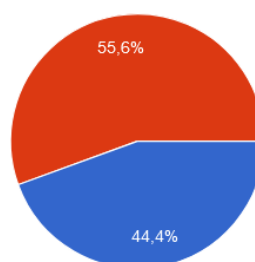
10. The assignments in the VR training were straightforward regarding what was expected of me.



11. I like that after the scenario, I got stars and feedback.

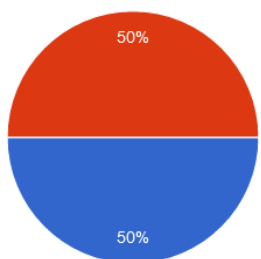


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

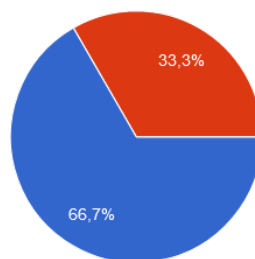


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

12. I enjoyed playing the Virtual Reality training.

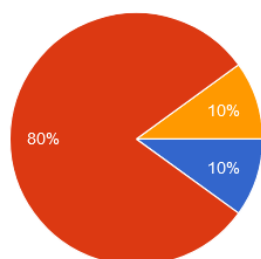


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

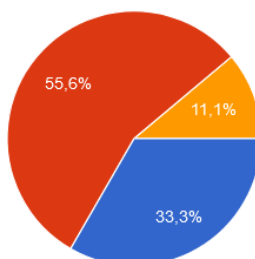


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

13. The speed of the Virtual Reality training was precisely right.

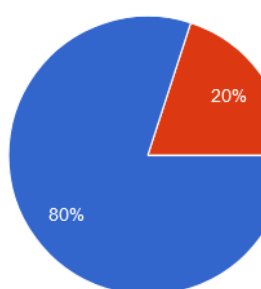


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

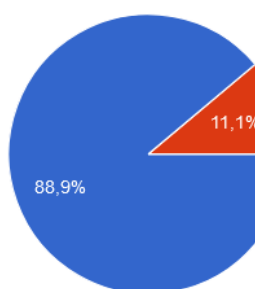


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

14. I found the time it took to do the Virtual Reality training:

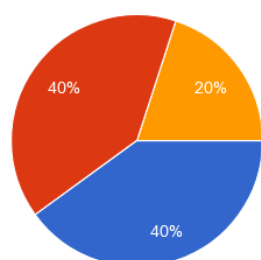


Exactly right
Too short
Too long

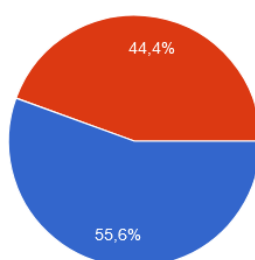


Exactly right
Too short
Too long

15. The situations depicted in the Virtual Reality training are truthful.

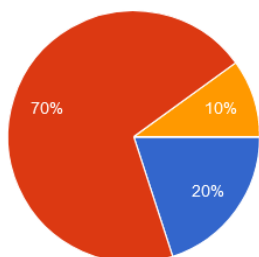


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

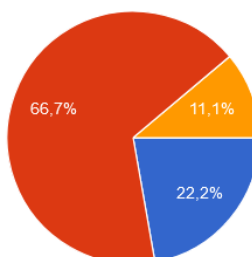


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

16. *The quality of the media was high.*

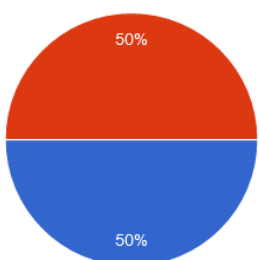


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

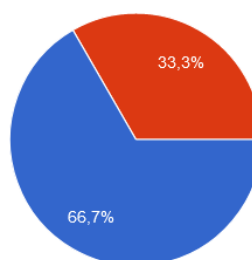


Strongly agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

17. *The devices we used were user-friendly.*

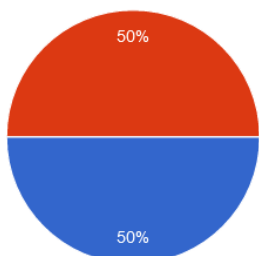


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

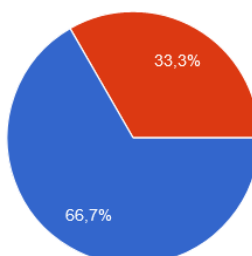


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

18. *I regarded the Virtual Reality training as user-friendly.*



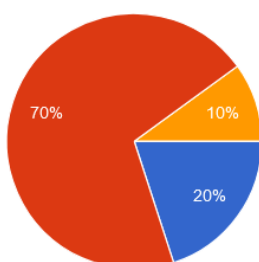
Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree



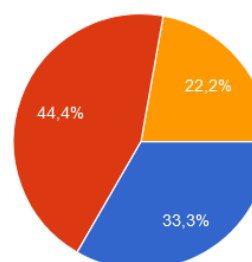
Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

Structure, content, pace, duration as well as user-friendliness were appreciated, approximately the same number of participants giving the same score or a higher one.

19. *The Virtual Reality training taught me how to work safely when objects are potentially falling.*

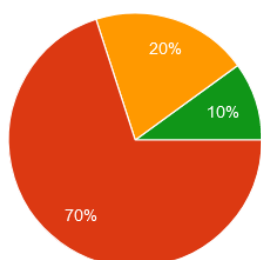


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

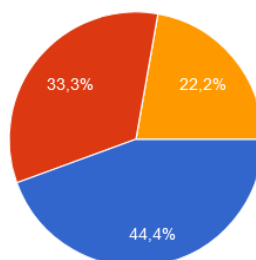


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

20. After doing this Virtual Reality training, I know what to do when I see a dangerous situation in relation to potentially dropping objects.

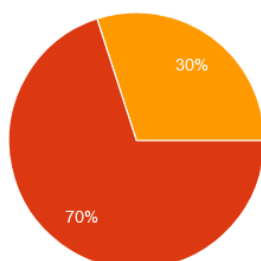


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

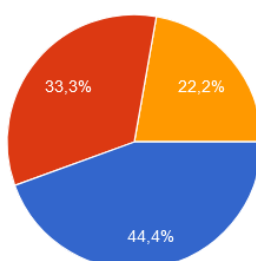


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

21. After this Virtual Reality training, I am able to recognise potential dangers and distracting activities while executing a work order.

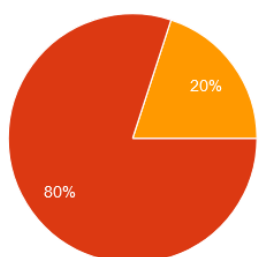


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

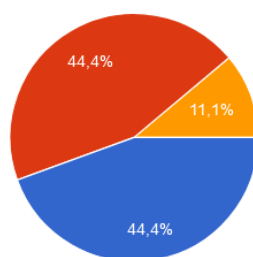


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

22. My confidence to do the right thing during a situation depicted in training has increased after doing this Virtual Reality training.

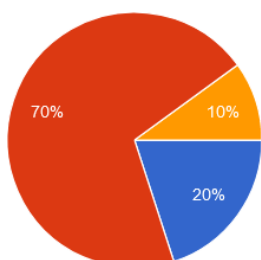


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

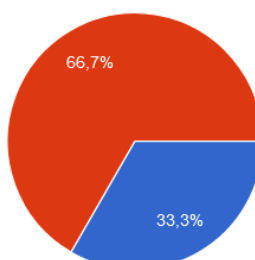


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

23. The realism of the Virtual Reality scenario has helped me understand the subject matter.

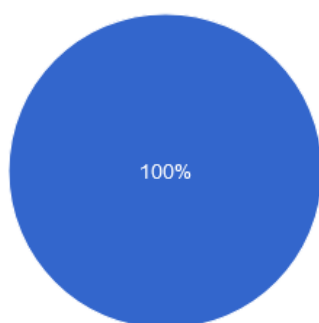


Strongly agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

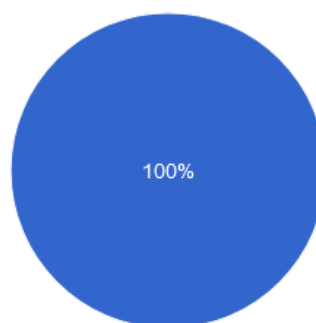


Strongly agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

24. I completed the whole Virtual Reality training.

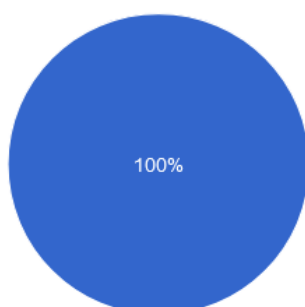


Yes
No

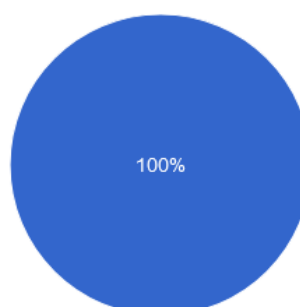


Yes
No

25. Now that I have experienced this Virtual Reality training, I would definitely like to do another type of training this way.

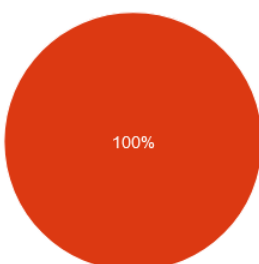


Yes
No
Maybe

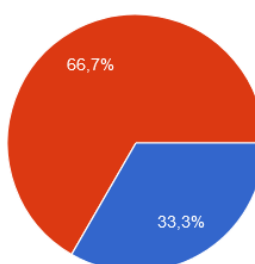


Yes
No
Maybe

26. The distribution of the Virtual Reality training went smoothly.

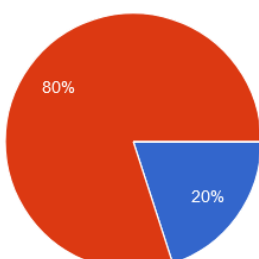


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

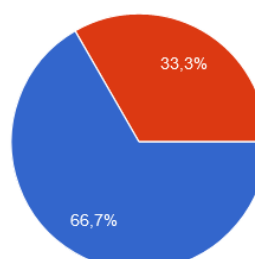


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

27. The space where I took the Virtual Reality training was quiet enough.

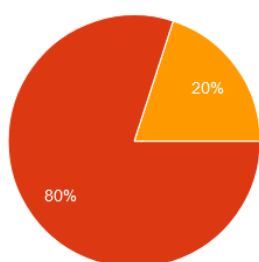


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

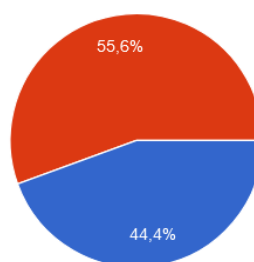


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

28. In the space where I took the Virtual Reality training, there were no objects in the way/disturbing me.

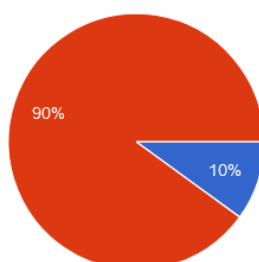


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

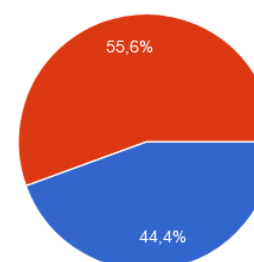


Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

29. The voice of the trainers was always easy to understand.



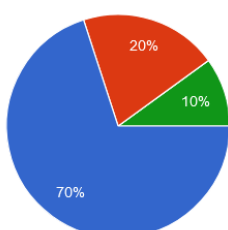
Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree



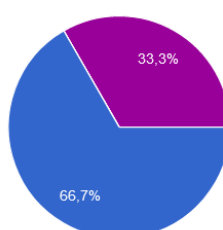
Strongly Agree
Agree
Somewhat agree
Somewhat disagree
Disagree
Strongly disagree

In the previous 6 questions regarding organizational matters, the answers about the second event show a higher score. One can draw the conclusion that either the training itself was better organised, therefore an improvement from the side of the host organization, or the personal experience was better as far as the participants were concerned. This can also be interpreted that an extra online preparation meeting organised by the project coordinator was efficient and contributed to integrating the feedback received after the first event.

30. The device I played the Virtual Reality training on:



VR headsets (Pico, Quest)
Smartphone (Android or Apple)
Android tablet or iPad
PC or MAC



VR headsets (Pico, Quest, Oculus)
Smartphone (Android or Apple)
Android tablet or iPad
PC or MAC
VR headsets (Pico, Quest)

31. How was the experience on this device?

VARNA:

- Good
- Interesting and fun, also very instructive
- Exciting!
- Good
- Nice experience
- very interesting and educational
- Very good
- Very easy to understand the topic and the headset was comfortable
- Excellent
- good

RIGA:

- Safe and friendly to use
- Amazing, helpful
- Comfortable after long use
- Good (Oculus Quest)
- Excellent
- Great experience
- Clear image and good sound, but the resolution of the screen could be improved.
- Okay
- Good

32. *Which part of the Virtual Reality training taught you the most?*

VARNA:

- Feedback, possibility to learn and try again.
- Recording a new scenario with simulator for VR headset
- Training scenarios
- Presenting BA set
- Scenarios
- practical part
- Every part
- The ECDIS (Electronic Chart Display and Information System) training
- technology giving chance to put avatar of real trainer
- bridge simulation

RIGA:

- B.A. set
- The entire training
- The clear instructions when assigning a task.
- part shown in the engine room
- Demonstration
- Finalizing
- I liked the blending of video footage with text and from scene to scene the evaluation
- Inter-vision with other trainers
- presentation of devices

33. *Which emotions did you go through while playing the scenario?*

VARNA:

- Exciting
- Excited
- Interest, amusement and contempt
- Sometimes boring, wanted more information
- Am I enough familiar with the VR to go through the scenarios?
- Satisfaction
- The new technologies
- Very informative, easy to understand and as close to the real thing as possible.
- big interest over technology
- close to the reality

RIGA:

- Funny and enjoyable
- Excitement
- Excited to do something new and interesting
- Exciting
- Was excited
- Confidence, that even if i make a mistake will be just an exercise. Surprised and enjoyment of experiencing new ways of learning.
- Mind-blowing how real the experience is
- as real situations

34. What would your suggestions be to improve the Virtual Reality training?

VARNA:

- More dynamic
- More scenarios with the influence of the trainees
- More equipment and platforms with different specifications
- Need to add informative text files
- More scenarios
- more practice in software, creation and implementation VR
- More scenarios and courses and higher quality equipment
- Some minor adjustments to the some of the scenes in the training
- to use higher resolution cameras
- more simulations

RIGA:

- Need to have more experience, especially regarding preparation of scenario and environment
- Practise more
- Be more careful when choosing the lighting when recording. This was mentioned as a suggestion by the host and was a really useful reminder.
- Filming, how to film depth so you can feel as waking through the room
- It was very well planned and organized
- No suggestions
- To use high performance headsets and to develop a diversified range of trainings.
- Maybe the pace on some subjects e.g. a too detailed instruction of a 360 camera
- everything was good

35. Which part of the Virtual Reality training has room to improve? What should be improved?

VARNA:

- Increasing participants activity within the VR training
- Better sound of the recordings
- Using of content creation platforms for virtual reality
- ok with the room
- I do not have an idea at the moment
- The equipment (VR camera with higher resolution), platform with more opportunities to work with the scenarios

- Improve the picture quality with better recording equipment explore the possibility of importing a 2D video in the 3D environment, and also a possible upgrade in the VR headsets.
- it will be great if we have interactive quiz incorporated
- everything was good

RIGA:

- Engine room. Lights, sounds.
- Filming
- Improve the visual quality of some of the recordings where needed.
- See my answer to previous question.
- More modules
- Adding subtitles to the videos
- None
- include LNG equipment

36. Any other questions or remarks?

VARNA:

- Continue the good work.
- To be clarified/ explore: combining of 360 degrees visualisation material with 2D; adding subtitles or different sound tracks; try other platforms similar to WARP
- It was a pleasure to host the DERIN TtT - Varna, Bulgaria meeting.
- thank you for training us

RIGA:

- A great experience as a whole.
- No, everything was OK. Thanks to the organisers for organising this event.
- Thank you!
- This questionnaire is answered with the experience of the TtT session, not a VR training itself
- Thank you for organizing training

CONCLUSIONS

Learning Teaching Training activities in DERIN project had the expected results, to teach participants work effectively and efficiently with innovative technologies, applications and resources developed as an up-skilling activity for teachers/ trainers, in line with the Annual Plan for professional training required at national/ organisation level.

The main objective of these Train the trainer sessions was to prepare teachers/trainers in the shipping sector to work effectively and efficiently with innovative multimedia learning materials and technologies, especially during crisis situations like the COVID-19 pandemic.

The objective was reached and the training complied with the requirements in STCW as amended and ES-QIN 2020.

In this respect, during the 2 (two) train-the trainer sessions, knowledge was transferred to participants: basic concepts of virtual reality, design features and principles of operation of VR devices, basics of working with platforms for creating VR content.

Abilities in the operation of VR systems, in importing modules into the VR development environment, and creation of virtual reality applications were formed and skills in using VR devices, in creating/operating applications with immersive content were developed.

Within the DERIN project, the Learning Teaching Training activities/ Train the trainer sessions were organized in such a manner that they increased the impact of the outcomes of the project for the education and training institutions involved with further reach on other organisations in the target group.

All participants developed new skills and competences.

For most trainers, this was a huge step up from passive PowerPoint-style courses they were accustomed to. According to their feedback, all participants were interested in attending similar training sessions in the future.

Project website: <https://www.derinnet.eu>