**How to avoid sea blindness:**

**Maintaining and enriching the knowledge capital of the European maritime sector**

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**Abstract**

Knowledge and competence are vital resources for the European maritime transport sector that needs further development for meeting challenges from global competition and the necessity of creating local and global sustainable transport. This paper describes selected results of the EU funded KNOWME project which was concerned with the creation of a maritime industry knowledge network for raising the knowledge level of the sector’s human resources and improving its image and marketability among key decision-makers, the labour market, and the public. The KNOWME project focused on the importance of the human factor within the shipping industry, which is covered by the European Commission’s ‘Maritime Transport Strategy 2009-2018’.

***Keywords****: seafaring, image of the maritime sector, maritime career*

**Introduction**

The future international competitiveness of the European maritime depends on sustaining and improving competitive advantage which relies on high quality and innovative education and training. The need of the labour market in the maritime transport sector for innovative educational opportunities that focus on their special working conditions is the main research subject of the KNOWME project – the European Academic and Industry Network for Innovative Maritime Training, Education and R&D. The main thrust of the KNOWME project is to engender a modern ‘image of shipping’ which attracts young people to maritime careers at sea and ashore and instils an awareness of the industry as a driver of EU development and an attractive employer. In the process, it is indispensable to work closely with the industry through a critical dialogue on potential future developments, current and future strengths and weaknesses, and the support required for sustainable competitiveness.

The KNOWME project covers the main issues addressed by the European Commission in the

Maritime Transport Strategy 2009-2018 focusing on the human factor, which is prioritized in the research call within the FP 7 work program 2010. The main concern is the growing shortage of maritime professionals, particularly qualified merchant marine officers. This entails the significant risk of decreased competitiveness of the European maritime industry in general. Consequently, the Commission seeks to raise the attractiveness of maritime professions to counteract the shortage of maritime professionals. Amongst other things, the Commission has identified the following measures to achieve this goal:

* Enhancing the image of shipping and careers at sea,
* Facilitating lifelong career prospects in the maritime clusters,
* Facilitating labour mobility in the maritime industries throughout Europe,
* Improving working and living conditions on board ships including safe manning and better use of ICT (Information and Communications Technology) for improving quality of life at sea,
* Cooperation between European maritime training institutions for updating seafarers competences and creating a network of excellence,
* For the education of officers, introducing an Erasmus -type model for exchanges between the maritime training institutions, and
* Research addressing the human element factor affecting the well-being of people at sea.

The maritime industry is competing with other industries to attract highly-qualified professionals and young people who are just starting their career. Thus, the key challenge for the maritime industry is to adapt to the expectations of these target groups. This is particularly addressed in the EU Maritime Strategy 2009-2018 as it calls for:

* Ensuring that ratings have open career perspectives, and eventually can become officers
* Encouraging best practices in promotion and recruitment campaigns
* Fostering communication in areas such as on board healthcare, distant learning as well as personal interaction
* Establishing maritime certificates of excellence (here the dual officer course and diploma may be important)

The maritime industry has to compete by offering attractive working and living conditions on board and also modern lifecycle-oriented career paths from on-board to on-shore professions. The topic has particular relevance at the European level because recruiting young Europeans to the maritime transport industry will help maintaining and developing further, the core competences of European maritime clusters. Offering modern education that not only focuses on operational aspects of maritime operations, but also on the wider context of ship operations as part of modern supply chains will enhance the attractiveness of choosing a career within this sector. A well-educated workforce is crucial if the shipping sector is to play a key role in the further integration of the European markets and solving the challenges of congested road and rail networks in Europe and the global challenges related to climatic and environmental issues.

The projects’ interrelated general objectives and the motivation behind them are as follows:

* Maintain and enrich the knowledge capital of the European maritime sector by identifying knowledge enablers. Encourage the creation, transfer and integration of knowledge. The Community’s maritime sector must sustain and improve its competitive advantage, independently from economic crisis. Therefore, a need of a general improvement of and strategy to develop such knowledge that will enable it to be more proactive in relation to developments originating from international competition and environmental requirements is imminent.
* Improve opportunities for innovative education and training. Employees in the maritime transport sector are in need of innovative opportunities for education and training that focus on their special working conditions. The KNOWME project will address this need by developing a center of excellence that develops and provides a product line of courses and training opportunities that meets the needs of industry as regards content, structure and teaching/learning technologies and with the necessary time, place, and communication convenience.
* Carrying out research for image improvement. The necessary modal shift of transport from land to sea will be facilitated by improving the image and awareness of the Community’s shipping among politicians, decision-makers, the general public and potential employees as well as the media and the opinion makers. Therefore, this project will carry out research among members of these groups to identify weaknesses and threats to be confronted and strengths and opportunities to be exploited.

The KNOWME project specifically addresses exactly the above-described challenges and contributes to raising the attractiveness of the maritime professions and particularly delivers content development on job opportunities and roadmaps for career management of maritime professions, including the onshore career perspective. Further, the networking approach assures a widespread dissemination within the industry and potential future maritime professionals.

The KNOWME consortium is made up of eleven institutions from six countries as follow:

|  |  |  |
| --- | --- | --- |
|  | **Institution** | **Country** |
| 1 | Edinburgh Napier University | United Kingdom |
| 2 | Hochschule Bremen | Germany |
| 3 | Jacobs University Bremen gGmbH | Germany |
| 4 | Fachhochschule Lübeck | Germany |
| 5 | Hogskolen i Molde | Norway |
| 6 | IVL Svenska Miljoeinstitutet AB | Sweden |
| 7 | Goeteborg Universitet | Sweden |
| 8 | Chalmers Tekniska Hoegskola | Sweden |
| 9 | University of the Aegean – Research Unit | Greece |
| 10 | Universiteit Antwerpen | Belgium |
| 11 | DSN Analysen & Strategien Kooperationsmanagement | Germany |

The consortium argues that maritime training and education requires a life-cycle approach, where demand-oriented transnational e-courses and supporting material are developed in line with industry expectations and modern lifestyles. Moreover, enhanced education and training for the industry’s professions must cater for a multicultural working environment, gender neutrality and maximum accessibility independent from time and space. An e-portal that integrates with other ‘e-maritime initiative’ developments is developed which promotes a modern image of shipping, career management framework and e-training and education facilities. Implementation of the proposed education and training strategies require the support of both industry and proactive national and regional policy and practices that enhance the transparency, transferability and compatibility of training and educations standards. The KNOWME project establishes a network of excellence in Europe, integrating experience from leading maritime research institutions. The pilot applications of e-courses developed within KNOWME allows for CPD, with the outcomes expected to contribute to improve living and working conditions on board vessels.

Concretely, the KNOWME project structured the undertakings in work packages to extensively cover the relevant areas to researchthe subject of maintaining and enriching the knowledge capital of the European maritime sector.

This paper summarizes the key findings and insights for each work package of the entire project which is structured as follow:

|  |  |
| --- | --- |
| **Work Package** | **Title** |
| 1 | Imaging – Creating a modern ‘image of shipping’ in Europe |
| 2 | Research for strengthening the human factors in shipping |
| 3 | Education of maritime and on-shore professions on job opportunities and career management |
| 4 | Review of education and training policies and practices from an international perspective |
| 5 | EU-Portal for career management and development, e-training and e-education |
| 6 | Organizational umbrella and collaboration between industry and education sectors |
| 7 | Project management, coordination of dissemination and exploitation |

The paper is structured into four sections. First, the technical and scientific objectives of the KNOWME project are presented. Second, the general methodological approach and structure are discussed. Third, the results and findings from various studies undertaken are outlines. Finally, the results from the studies conducted in the KNOWME project are summarized in the conclusion.

**Technical and scientific objectives**

The methodological approach and structure of the KNOWME project are guided by an organized set of objectives. The project and its general and sub-objectives all support the development of a modern image of shipping and awareness building among professionals and young people. The following outlines the specific objectives of the project in relation to the general objectives:

1. To create and disseminate a modern image of shipping as a competent and innovative industry which attracts young people both for seafaring professions and to careers onshore within the maritime sector

1.1 To carry out research on the current image of shipping among professionals and young people and opinion makers as well as on the media in Europe

1.2 To create a modern and competitive image of European shipping facilitating recruitment of professionals and young people

1.3 To establish an EU-portal for the promotion of a modern image and intensify awareness of the Community’s shipping activities

1.4 To identify and put on the map best practices related to social responsibility and the sustainable development of the shipping industry. Such practices must be recognized as the key to the sector’s image improvement

1.5 To identify, promote and integrate best practices for the recruitment and promotion of young professionals by the industry

2. To enhance the attractiveness for professionals and young people both of the seafaring professions and careers onshore within the maritime sector, particularly addressing career management and to enhance its competitiveness compared to other sectors

2.1 To introduce an integrated approach for the development of Maritime Education and Training at the European level

2.2 To offer education and training which facilitates the acquisition of hard and soft skills needed for the modern career management the for seafarers and on-shore staff under a life-cycle approach

2.3 To offer education and training which facilitate knowledge transfer and the transition from on-board to on-shore professions

2.4 To introduce enhanced virtual accessibility to business and career networks and education and training offerings through e-learning and, thereby, to also bridge the on-board digital divide

2.5 To carry out research on the current status, and future potential for improvement, of living and working conditions on-board

2.6 To carry out research on policy and practice in European maritime countries and regions as the basis for policy recommendations

3. To establish a knowledge network of centers of excellence in maritime transport and logistics training as one of the foremost academic and industry networks for innovative education and R&D

3.1 To integrate existing European networks and centers of excellence in maritime education, training and research based on an organization and business model

3.2 To organize campaigns, conferences and workshops in collaboration with market stakeholders for the promotion of the project‘s goals

3.3 To facilitate the creation of regional clusters/networks of maritime stakeholders with training institutions acting as coordinators and to create mechanisms which guarantee the cooperation-coordination between regional networks

The KNOWME project presupposes that an enhanced attractiveness of the maritime professions is a precondition to building and disseminating a consistent image of shipping. The knowledge network of centers of excellence in maritime transport and training will enable the enhancement of the attractiveness of the maritime industry and sustain this image and awareness building. The project contributes directly to making the maritime professions on-board and onshore more attractive and competitive, thereby counteracting the shortage of maritime professionals.

The overall scientific and technological objective of the KNOWME project is *to develop a strategic framework for creation, transfer, and integration of knowledge that will promote the image of maritime industry*. More specifically, the KNOWME project provides valuable input and further drive the development of the EU e-Maritime Initiative. This allows strengthening the education and training components of the e-maritime initiative through a transnational educational perspective. This overall scientific and technological objective is addressed by the following five sub-objectives:

1. To carry out research on the current image of shipping among professionals and young people in Europe and on the requirements on improvement

* Research for image and awareness strategy development. This includes:
  + *investigation on the perceptions of, and attitudes towards the shipping industry among key target groups*
  + *converting research outcomes to message content for promotional activities*
  + *development of strategies for image and awareness improvement in key target groups*

1. To work as a tool of self-assessing the industrial gaps of demand and supply in terms of numbers and skills of seafarers and professionals

* Detailed research questions:
  + *Research on the statistics of supply and demand of officers and ratings,*
  + *Research on the number of Marine Academies and Maritime Universities in EU*
  + *Research on the educational programs of Marine Academies and Maritime Universities in EU, regarding the similarities and differences in offered courses (and course contents)*
  + *SWOT analysis*
  + *Training Needs Analysis (TNA)*

1. To identify and put on the map best practices related to social responsibility and sustainable development of the shipping industry as a key to its image improvement

* Detailed research questions:
  + *Implementation of coherent, transparent, efficient and simplified solutions in support of education and training*
  + *Promoting co-operation, interoperability and consistency between maritime education and training standards*

1. To carry out research on the status and potentials for improvement of living and working conditions on-board

* Education and training
  + *Use of e-learning where relevant, the facilitating and supporting the development and adoption of the latest ICT technologies in maritime industry education*
  + *Course content that meets the need of an integrated view on transport chains*
  + *Courses that facilitate career changes from sea to land and from land to sea along the transport chain*
  + *Stand-alone training courses for industry that later on can fit into formal academic degrees such as Bachelor or Master degrees*
  + *Courses and training programs that address the needs of ship operators, ports and hinterland carriers*

1. To carry out research on policy and practices in European maritime countries and regions for policy recommendations

* Detailed research questions:
  + *Knowledge transfer*
  + *Developing virtual competence centers with internet access to expertise and specialized knowledge within seafaring, maritime economics and management and related subjects.*
  + *Developing an internet information system which continuously transfers information about on-going research of practical relevance in the form of newsletters.*
  + *Arranging seminars with industry participants for quick transfer of contemporary research of immediate practical relevance*

**The methodological approaches and structure**

The KNOWME project constructively builds upon existing state-of-the-art networks and project outcomes, i.e. the EFFORTS project and the Northern Maritime University (NMU). This particularly includes building upon experience in successfully setting up transnational research networks and industry stakeholder integration. KNOWME integrates the NMU focus on academic education for maritime transport management and the EFFORTS outcomes targeting training and sea ports, and adds to this the complementary expertise of academic partners which are not part of the NMU project (such as University of the Aegean, ITMMA University of Antwerp and CHALMERS University) and the close industry relations of the consortium with e.g. Germanischer Lloyd. KNOWME is also driven by strong collaboration with industry.

The KNOWME project bridges relevant approaches and integrates:

* Educational content at the academic and training level,
* Education for professionals on-board and on-shore, facilitating their mutual transition and virtual accessibility through e-learning,
* Education and research institutions of excellence into a European network,
* Existing education and industry networks at individual partner or country level.

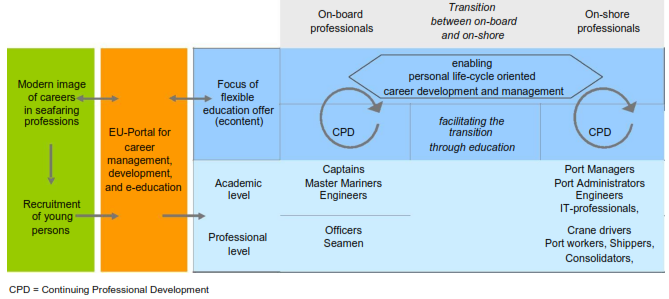
Such integration of these dimensions is the basis for developing a consistent Strategic Framework for

a Modern Image of Community Shipping meeting the needs of a modern lifecycle oriented approach.

The integration of these dimensions is illustrated in the following figure providing an overview of the

general concept of the KNOWME project.

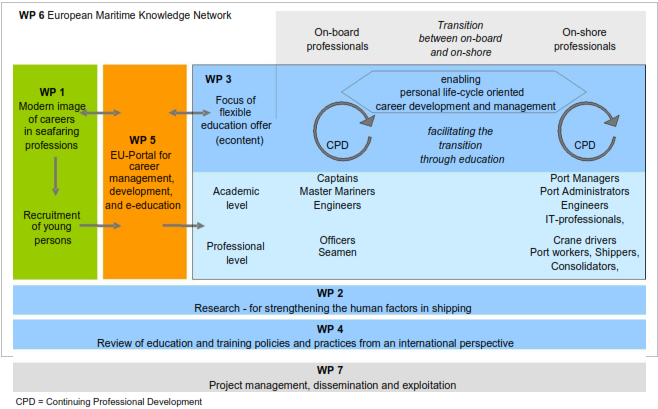
**Figure 1. Integrated concept for the modern image of the seafaring profession, career development and education content.**



The KNOWME project implements a strong stakeholder strategy integrating organizations and key persons from the maritime industry like ship-owners, sea ports and trade unions, media, and policy and opinion makers. The approach of the stakeholder strategy mainly integrates associations at European level. Thus, the interests of the entire maritime industry are better considered, leading to a higher acceptance of project results. Through the integration of European associations as multipliers within in the maritime industry, the results of the KNOWME project reach an adequate dimension at regional and European level. Being aware that it is difficult to involve European Agencies as full project partners, the KNOWME project approached them to seek their availability for participating in proactive discussions and using their fora and meetings for developing the KNOWME objectives.

KNOWME comprises seven (7) work packages or WP, each consisting of several tasks as mentioned in the introduction. The structure of the work packages is described in the following figure. The Project structure is consistent to the overall concept of KNOWME thereby assuring the successful realization and sustainability of KNOWME beyond the conclusion of the project.

**Figure 2. Overview of Know-ME work packages structure**



The focus of WP1 is the image of the European shipping industry and the vital role it has in developing maritime transport as the major future, sustainable transport alternative. A positive image of shipping is important for its ability to attract

* young talented people as future employees to the industry,
* shippers to use shipping for transports where competitive modes exist,
* educators such as universities to develop attractive educational programs,
* financial institutions to make funds available for future oriented investments in the maritime sector,
* mobilizing new creative power in public institutions and private companies already active in the maritime sector.

WP1 makes a broad study of the perceptions of, and attitudes to, the shipping and maritime industry among relevant target groups. This study uses both as a base for describing and explaining the images that relevant groups have of the shipping and port industries and for suggesting constructive message elements for various actors strategies that aim at improving the image of these industries.

WP 2 focuses on research to strengthen the human factors in shipping. Shipping and those who work within the cluster in general, and on-board specifically, is becoming increasingly global and multi-cultural. There are strong indications that this is sometimes leading to misunderstandings, miscommunications and even cooperation problems both between ships and within ships. This is happening at the same time as crew sizes are gradually being reduced. With more paperwork and less crew, there is little room for flexibility. In order to instigate change and improvements a thorough understanding of the industry s perception of the human capital is needed. Building on this understanding, focus will move on to study the job on-board and how function-based thinking may underlie flexibility in job planning. The use of ICT will be studied as part of the job investigation, as it seems to be a hindrance in many instances when it should be a support. Based on these results a model is developed for manning and job flexibility that will support crew optimization.

WP 3 looks into education of maritime and on-shore professions on job opportunities and career management. Maritime industry employees have to cope with rapid change of knowledge and increasing job profile requirements. Thus, the educational level has to be lifted continuously and in shorter intervals. An adequate education concept matching individual life and job situation of the workers is therefore needed. The approach required shall increase capability of people to upgrade personnel and formal skills to an academic level. Crucial objective of this WP is raising permeability from worker level to academic tasks and vice versa on basis of high-quality e-learning material and course methodology.

E-learning is seen as adequate learning methodology for people working in the maritime industry and to improve their level of education. Digital self-learning material can be provided in a very flexible and attractive way. Participants are able to join training independently from time and place. Collaboration between learners is easily enabled by the web although people attend distant education. Learning to one´s individual pace gets possible. The learning material is enhanced by multimedia elements as there are animations, simulations, interactions and videos. The concept accelerates and improves learning processes by different didactical scenarios. It increases willingness and motivation to raise the individual qualification level of employees. E-learning is mostly adequate to approach people with non-academic qualification to higher education level without demotivating and overstraining them. As learning material in higher education scenarios is mainly text-based, the target group of workers in the maritime industry has initially to get familiar with it. Multimedia enhanced textbooks will help them to develop adequate learning behavior and capability. Within the WP 3, a pilot application is implemented. The pilot consists learning material production and embedding them in an e-learning course concept for the target groups defined. The WP ran a course test with the developed e-courses in co-operation with industry stakeholders.

WP 4 reviews of education and training policies and practices from an international perspective. This work package is not just a survey of what is currently being done but includes a gap analysis and concludes with a road map. The policies review is based on officially published documents and the impacts experienced by those affected thus delivering a cause and effect survey. Experiences of relevant job centers are captured and processed in order to identify gaps and shortcomings of the current approaches. An excellent starting point is provided by IMO document A26/INF.4 22 October 2009 Outcome of the Young Seafarers Focus Group 2009 arranged by INTERTANKO and ITF. Reviewing current practices in the member states mainly addresses relevant social groups as unions and other employees associations and professional bodies and employers’ associations. The search for best practices, ideas and concepts contributes to a model and actions program to,

* develop and communicate a better image of jobs relevant for shipping aboard and ashore in general,
* use and enhance existing networks to improve the image of shipping and to intensify the awareness of the significance and the potential of the Community s shipping especially amongst young people
* identify potential cores of centers of excellence in maritime transport and logistics training and education and their ability to develop towards networks
* review existing relevant networks and platforms such as e.g. The Maritime Industry Foundation (see http://www.maritimeindustryfoundation.com/index.htm )
* investigate opportunities to establish a appropriate knowledge platform for all stakeholders or recommend existing platforms for further development
* identify the most appropriate methods for training and education in maritime transport and logistics including advanced methods such as blended learning.

Recent experiences with shipping-related professions show that the highly specialized sectors need programs enabling employees to better change from one sector to the other in case of an economic recession in a specific sector as e.g. currently in ship building. For young people it is much easier to join a seafaring career once they know that there are opportunities to e.g. change to logistics later.

This requirement is most urgent for the shipping industry but also becomes increasingly relevant for other industries hence providing the shipping industry the opportunity to become a protagonist in the field.

WP 5 develops a portal for career management and development, and e-education using a modern Image of shipping, dissemination and exploitation. The KNOWME portal is a key instrument to disseminate a modern image of shipping as a competent and innovative industry which attracts young people both for seafaring professions and to careers onshore within the maritime sector. The concrete target groups of the portal and their expectations and information will be duly identified. The target groups range from young people as potential work force on-board and onshore to stakeholders from maritime industry and policy in the EU and beyond.

The portal considers modern communication means like social and interactive media. Thus, a concept for a Facebook of shipping connecting career development, life-style and education (social and career networking) is developed. Further, a virtual handbook on modern shipping is developed and implemented. Furthermore the e-portal provides access to e-education facilitating modern career management and development for seafarers and on-shore staff under a life cycle approach. The portal emphasizes web 2.0 applications and an open source approach in order to communicate authentically a modern image of shipping thereby meeting the specific expectations and lifestyle of the target groups. The work-package emphasizes to develop a wording and look-and-feel fitting to target group milieus. The e-portal is the communication hub for e-promotion activities to disseminate the information offer of the EU portal to the target groups like lifecycle-oriented career paths within the Community’s shipping, best practice in the Community’s maritime industry and career opportunities, trends and future requirements in maritime training and education and professionalization.

The objective of WP 6 is to build up and exploit the KNOWME network as a strong transnational network of education and training providers. A central point to the KNOWME project is to integrate with industry as employers of future maritime professionals on the one side and to reach out to young people as future employees in the sector on the other. Networks cannot be created artificially but need to grow and build on dialogue and trust. The KNOWME project builds on two strong already existing collaboration networks and platforms the Virtual Maritime University and Northern Maritime University (NMU), but also has strong established ties with industry associations and individual maritime, port and logistics sector companies. WP6 therefore organizes and coordinates outreach and dissemination activities on two levels:

* Industry level - by organizing specific sessions and workshops addressing specific KNOWME topics as identified in WP1 through WP4 at established industry conferences and exhibitions (e.g. CoastLink conferences, Annual Conferences of the International Association on Maritime Economists, ESPO conferences etc.)
* School level - by organizing school visits in partner countries using information material for schools (WP1) in co-ordination with WP5 dissemination activities

Integration of potential beneficiaries into the network (i.e. international and SME shipping companies, port authorities, logistics operators etc.) to constructively build dialogue on qualification needs for attracting future maritime professionals, to enhance the design of educational programs, and last but not least to drive innovation relating to career management in the maritime industry.

The consortium specifically uses existing industry conferences and exhibitions for their activities in WP6. This strategy allows reaching a wider group of stakeholders, particular as additional events would imply additional costs for industry, which in the current economic situation of the sector seems wise to be avoided, if the goal is to have significant industry participation and outreach. One main goal of WP6 is to deliver a strategy to integrate the KNOWME network and project results into the e-maritime initiative. This strategy shall also clearly deliver a concept for the evolution of the project after the project end.

WP7 comprises three main tasks: 1) organizing and managing the consortium and the related workflows, 2) organization and coordination of dissemination and 3) exploitation activities.

Dissemination is aimed at defined target groups, including academic researchers and industry stakeholders and includes the establishment and continuous updating of a project website, circulation of a project presentation leaflet, issuing of six-monthly newsletters and a targeted press pack. Dissemination activities are also organized in cooperation and coordination with WP5 and

WP6. Dissemination targeted at the academic community focuses on presentations at international conferences and publications in appropriate journals. Members of the consortium exploit their contacts within the industry to promote KNOWME offerings. Intellectual property rights

within the KNOWME consortium is protected through an internal consortium agreement covering ownership and

To summarize the methodological approaches and structure of the KNOWME project, WP1 is a key building block for the project investigating and reflecting how a modern image of shipping can be created particularly in relation to the attraction of young people. WP2 and WP4 lay foundations for the project results, outcomes and pilot applications analyzing the role and future of human factors in shipping (WP2) and reviewing policies and practices within the EU and beyond in relation to education and training in the maritime industry (WP4).

WP3 is the heart of the project as it develops a list of and reviews existing training and education initiatives. Based on Training needs assessments it then develops innovative pilot applications as e-courses that address the current needs of the shipping industry and can be used as a model for future training development concepts. Further WP3 directly addresses young people in pilot applications. The results of WP3 build heavily on the findings in WP1, WP2.

WP5 addresses publicity and dissemination in a two layered approach that allows integrating dissemination of the project and tangible results through the use of the KNOWME e-portal. A central concern is the design and presentation of the online material to build a modern image of shipping, including e-courses and the evaluation of the outreach to target groups.

WP6 deals with the construction of the industry knowledge network and is strongly related to WP5 and uses the results of WP3 as a center point to construct the network through activities in collaboration with industry, education and training providers and public sector stakeholders. The final WP7 deals with the efficient and effective management and communication, as well as the organization of dissemination and exploitation activities of the project. The realization of dissemination and exploitation activities is strongly embedded in WP5 and WP6.

**Results and findings**

The KNOWME project focuses on the importance of the human factor within the shipping industry, which is covered by the European Commission’s ‘Maritime Transport Strategy 2009-2018’. Throughout its project duration from 2011 to 2014, researchers from six countries across Europe have addressed the following topics:

* Creation and dissemination of a modern image of shipping;
* Recruitment and retention of workforce in the maritime industry;
* Improving working and living conditions for seafarers;
* The current state and future of maritime education and training;
* Innovative maritime education and training policies;
* Collaboration between industry and Maritime Education and Training (MET) sectors.

*A modern 'image of shipping' in Europe*

The continuously evolving environment of the shipping industry has created numerous dilemmas for companies in how they can operate efficiently and in a socially responsible and acceptable manner. Thus, Corporate Social Responsibility (CSR) has emerged as a voluntary concept, which can simultaneously enhance the performance of the company, whilst fulfilling societal values. The KNOWME project mapped out the best practices of the shipping industry in CSR and analyzed the relevant perceptions and views of the maritime stakeholders who are the receivers of the impacts generated by CSR activities. The main conclusion was that the CSR concept in the shipping industry could be better served when both human resource and environmental factors are combined.

A key factor for the competitiveness of the European Maritime Industry (EMI) is the future supply of a young talented workforce. The KNOWME project looked into important aspects of how to design and operate a marketing communication process as a strategy for improving the image of the shipping industry as a labor market and as a career opportunity for young people. As a starting point a survey was carried out among 2000 pupils in Sweden, Norway and Greece. Based on the survey, the concept of image was defined conceptually and empirically using scientific methods as a fundamental platform for the development of communication strategies. Image was identified as a multidimensional concept and its dimensions were measured in terms of strength and importance for pupils’ choice of career path. The study also analyzed the importance of different variables for pupils’ stated intentions to work as seafarers, such as influences from parents, friends, place of living and choice of educational program.

Building on the survey results, a study conducted within KNOWME explains how to design and operate a marketing communication process as a strategy for improving the image of the shipping industry in order to increase its attractiveness as a labor market and career opportunity for young people. Based on scientific knowledge about the image concept, the KNOWME project partners have developed several tools for marketing communication. This tool box includes an information brochure about shipping as a career path; the e-portal “Go-Maritime” which describes jobs and career paths in shipping; two complete sets of teaching materials aimed at pupils and University students; and a blueprint for designing a national organization called ‘NIMCO’ (**N**ational **IM**age **CO**mmunicator) for communicating a positive image of shipping as a career opportunity to young people. The NIMCO blueprint includes descriptions of organizational structure, knowledge platforms based on the survey conducted in Sweden, Norway, and Greece, communication systems, operational principles and a set of recommendations for forming NIMCOs.

The recruitment and retention of seafarers in the shipping industry is currently a major issue that most shipping and ship management companies are facing. Working and living conditions are crucial for both recruitment and retention. Moreover, access to communication is considered an important factor that affects these conditions. To understand the communication options available on board ships, particularly when it comes to the use of the Internet and to get to the heart of shipping industry retention, a survey of shipboard personnel has been conducted. More than 500 seafarers responded to a specifically designed questionnaire that aimed at gathering information on various work-related issues and on job satisfaction, with a particular focus on the role of communication services and their availability on board, the type of access to communication facilities and the cost of access for the seafarers. The results have shown that respondents perceive the separation from family and the inadequate communication with family and friends while at sea as the most important issues hindering retention in the seafaring profession.

An information brochure about the shipping industry and associated job opportunities has also been prepared. The brochure uses simple language and pictures to inform its readers about the shipping business, life on board and job opportunities. Some country-specific information and a number of job profiles are also presented in the brochure. The brochure is also available in a shorter version as well as in a flyer format.

*Strengthening the human factors in shipping*

The KNOWME project analyzed the future demand of maritime professionals in the maritime and port industry. The analysis indicated that there is still a need for traditional seafaring skills, but there is also a requirement for soft and non-technical skills, cross-cultural management and communication skills. The data also points to a need for new competences both at STCW level and above, however these differ from country to country. These competences have arisen due to changes, such as an increase in administrative tasks originating from the introduction of new regulations and policies, as well as changes in company ownership. There are also demands which have arisen due to the advancement in information technology and other forms of technology. However, it should be noted that there are national differences in the preferred competences.

The project carried out an analysis of the training needs in managing the cultural diversity of people employed within the shipping industry, both on-board and ashore. The analysis concluded that the development of cross-cultural competency has not been on the agenda of maritime education and training, despite the fact that the shipping sector is highly globalized and the maritime labor market is widely multicultural. Working conditions on-board determine the cross-cultural competence as an essential part of a seafarer’s skill set. The current and future needs of the maritime industry, shipping companies and organizations related to communicating and cooperating effectively in a multicultural and globalized working environment, raise interest and substantiate the necessity of developing cross-cultural competency among current and future maritime professionals.

The project developed a cultural roadmap to assist shipping crews in gaining a better cultural understanding of their fellow crew members. These guidelines provided both basic theoretical knowledge about cultural differences and the role of communication in cross-cultural awareness, as well as exercises that focused on a direct practical application of the theory.

*Integration of maritime education and training*

Research within KNOWME has been carried out to evaluate the current status of integration between maritime education and training institutions in eleven Member States that are also the largest labour suppliers in Europe. It has been found that there is collaboration across borders within Europe when it comes to research and development projects and/or different types of exchange and mobility of staff and students. However, despite a few exceptions, the exchange of knowledge between MET institutions is low, and it is likely that a more formalized network of collaboration would benefit MET institutions, students and maritime professionals. The study has also shown that the predominant focus of MET is on operational jobs at sea, and very few possibilities exist for a seafarer who wishes to update his skills for a job ashore.

Based on a Training Needs Assessment, the project has developed the following three e-courses: Cross-Cultural Training, Maritime Logistics & Supply Chain Management and Environmental Management. The target groups for these courses are the potential and current workforce, both on board as well as ashore, and employees of the wider maritime industry. The courses enable people to develop and manage their careers through a lifecycle-oriented approach and are offered free of charge.

The pre-training evaluation of the KNOWME e-courses showed that they were suitable to the users learning needs. The courses were rated as very good in terms of content quality, learning goal alignment, motivation, presentation design and reusability. Some recommendations for improvements in the training content were given. Summative evaluation which was based on data obtained from a diverse group of trainees revealed their positive evaluation of the e-courses. The vast majority of the pilot users stated their very strong or strong agreement in almost all areas that were examined in the evaluation questionnaire. Minor deviations appear for the Cross-Cultural Training course, which however could be attributed to the different characteristics and needs of this course. Pilot trainees expressed their need for more training and proposed some potential improvements on the content and the structure of the courses.

In addition to the three e-courses developed within KNOWME, the links to many more e-learning courses from other sources such as the Northern Maritime University project, the EMAR ‘e-Maritime Strategic Framework and Simulation based Validation' project and the TrainMoS (Training for the Motorways of the Sea) project are now available on the Go-Maritime portal. These cover topics such as Ship Technology, Maritime Transport Economics, Maritime Transport and the Environment, to name but a few.

*Policies and practices from an international perspective*

After the introduction of the Integrated European Maritime Policy of the European Commission in 2007, many Member States started developing or altering their own national policy in order to remain competitive on an international level. The KNOWME project analyzed the state of policies and strategies in European countries with regard to training, education and knowledge development in particular. A conclusion is that most European countries have a well-balanced maritime policy and are also active in organizing initiatives. Results from a survey conducted within KNOWME showed that overall educational institutions were rather satisfied with the initiatives, policies and strategies created by the EU and national governments.

*Portal for career management and development*

The ‘Go-Maritime’ e-portal has been developed as part of the KNOWME project and is intended for pupils, students, job beginners and young professionals who are interested in a career in the European Maritime Industry (EMI). The portal aims to promote a positive image of shipping. It raises awareness for the broad range of job opportunities in the sector, and seeks to support the beginning of a career path and to show the concept of a career lifecycle in the EMI. ‘Go-Maritime’ provides profiles of the different opportunities to work onboard and ashore in ports, as well as in shipping and logistics companies. The profiles present a realistic idea of a working routine, in terms of ‘real life’ situations of the professional life at sea, such as a typical day in the life of a Ship Deck Officer. In the interactive section of the portal, the user can track ships, practice a seafarer’s vocabulary and keep up with the shipping industry via videos and other media. An interactive map provides direct access to stakeholders from the EMI with local contacts from education and training institutions, shipping companies, ship owners, public authorities, crewing agencies, sea ports and more.

In the first half of 2014 the KNOWME project partners carried out a qualitative online evaluation to find out the strengths and weaknesses of the test version of the Go-Maritime portal and to collect ideas on how to improve the career site. More than half of the participants of the survey were pupils and students and one third were young professionals. In addition to the online survey the project partners conducted expert interviews with HR staff from European maritime companies. The vast majority of the participants gave positive feedback about the general attractiveness, design and usability and multimedia elements. The thematic sections 'Working ashore' and 'My maritime career' were rated as most interesting. Due to practical reasons the project partners decided that all information on the portal should be published in English only. Despite this limitation, the participants in the evaluation responded that the use of a single language is not a problem. Moreover, they found the language easy to understand and follow. The vast majority of the respondents fed back that the Go-Maritime portal draws a realistic and positive image of the maritime industry. Furthermore, about two thirds of the participants agreed that the Go-Maritime portal had improved their attitude towards the maritime industry. The KNOWME team introduced the following modifications as a result of user feedback. A link to national maritime career sites and additional e-learning sources were added. The list of contact persons and organizations on the already existing page “Mapping the European Maritime Industry” was also extended. This enhances the possibilities to find local contacts at education and training institutions and shipping companies.

*Collaboration between industry and education sectors*

A central aim of the KNOWME project was to foster the collaboration between industry and the education sector. The project has organized stakeholder group meetings, while project partners have presented at conferences and exhibitions and have discussed relevant topics with industry representatives.

The project has also developed information material for pupils to inform them about the career prospects that the maritime industry offers and has made it available to teachers and career advisors in partner countries for future use in schools. A number of school visits to raise pupils’ knowledge of the maritime industry have been conducted in several partner countries.

The KNOWME project partners launched a cooperation project between the Maritime Academy of Antwerp (Hogere Zeevaaartschool) and the University of Bremen. This pilot was implemented in order to gain experience for a cooperation program between maritime institutions and universities, which represent two different types of knowledge institutions, each with different goals when it comes to the training and education of seafarers. Both universities and maritime academies can profit since the aim is to reduce the gap that exists between them. This study provides a set of rules, guidelines and recommendations to improve cooperation within the European network of educational institutions.

The KNOWME project partners initiated the ‘Go-Maritime’ LinkedIn group. The idea is to publish topics on maritime training and education and to facilitate discussions with young professionals, industry representatives and other relevant stakeholders. We are also part of the ‘Your Maritime Career’ LinkedIn group, currently managed by Rory McGuire of Flagship Management who is a supporter of the KNOWME project and has been disseminating our results and events amongst his group members. The membership in this group would allow us to continue to disseminate and build on the results of our research and could possibly lead to establishing new collaborative partnerships in the future.

Collaboration has been established between the EMAR (‘e-Maritime Strategic Framework and Simulation based Validation’) and KNOWME projects to place some of the results of the KNOWME project within the e-maritime initiative. The EMAR team developed a ‘maritime e-Recruitment service’, implemented over the EMAR Platform, which aims to become an assisting service to future or existing crewing applications. Before applicants proceed to the completion of their application, they are offered an opportunity to enhance their knowledge of the maritime sector, the pathways leading to different careers and the free opportunities to undertake additional e-learning that could lead to something bigger and better in their career. Some links to relevant sections of the Go-Maritime e-portal, which combines the results of many research studies within KNOWME, have been made readily available to applicants to provide them with some useful facts about the maritime industry and more specifically to help them make an informed choice of a career in the maritime sector.

The KNOWME final conference entitled ‘The Future of Maritime Education and Training’ generated genuine interest amongst representatives from shipping companies, maritime recruitment agencies, shipowners’ and shipping associations, the trade union for seafarers, academia and policy-makers attending the conference, and further strengthened the links with the project stakeholders. Some of the most important messages from the KNOWME project were presented:

* The need to develop a strategy which improves the image of the industry at the national level. This would best be achieved by the adoption of a set of National Image Communicators, or ‘NIMCOS’ which emphasize and tackle the specific image dimensions of importance.
* The main ideas coming from KNOWME research to help address the labour supply constraints relate to: 1. Training provision offered in the right places; 2. Language education and cultural factors focused on; 3. Overcoming the image issues of shipping; and 4. Ensuring Continuous Professional Development (CPD) for employees.
* Identification of the most important factors influencing working and living conditions on board ships which are necessary to retain seafarers in their jobs. The development of e-learning modules on Cross Cultural Training, Environmental Management and Maritime Logistics and Supply Chain Management was announced.
* The KNOWME project has established that national maritime policies tend to be fragmented and somewhat inconsistent across EU states. Indeed a number of states have no, or very limited, maritime policy, not least with respect to Maritime Education & Training (MET). The main focus for MET in future should emphasize: 1. Sustainability of shipping; 2. Quality of services; 3. Training; and 4. Career development. There also needs to be more stress on the use of maritime clusters involving various key stakeholders in order to help provide MET solutions.

**Conclusion**

The Know-ME project has delivered a number of final results with broad-ranging implications to avoid “sea blindness” by maintaining and enriching the knowledge capital of the European maritime sector.

***Development of a clear vision of the “image of shipping” from a variety of perspectives.*** A strategy for enhancing this image, in a way that directly impacts on the quality and quantity of new recruits into the maritime sector, has been identified and implemented.

***Recognition of the contribution made by human capital (on board and on shore) to the economic state of the maritime sector.*** This will allow the potential impact on the economic performance of the sector to be predicted and evaluated against the likely cost of implementing alternative strategies for the optimum deployment and utilization of human capital. The alternative strategies that have been developed and evaluated on this basis have encompassed multicultural and gender issues, as well as issues related to the accessibility of virtual resources for continuous professional development. This will have a direct impact on the quantity and quality of new recruits into the sector.

***Identification of training and educational requirements and opportunities for the maritime sector, including gaps and shortages.*** This involves the design and delivery of a customized modular training and education strategy that integrates current offerings at different levels of attainment and within different types of institution. Content has been developed and piloted within an e-learning context, comprising environmental, logistics and human resource courses. The direct impact of this will be enhanced professional competence within the sector, leading to increased safety and reduced environmental damage. Greater harmonization of professional training requirements for the sector has been achieved through a comprehensive review of current regulatory regimes and their requirements, and the identification of policy recommendations. The overall result will be an improved image of the maritime industry, thus attracting more young recruits into the sector with appropriate entry level qualifications.

***The design and development of a user-oriented EU portal for the maritime industry, based on external and stakeholder perceptions of the sector.*** The Go-Maritime portal will continue to communicate a new, modern image of the maritime industry that generates interest in the sector. It has not only provided users with direct access to e-learning opportunities and career prospects, but has also played an important role in disseminating the results of the KNOWME project and facilitating network development.

Various dissemination activities have been carried out to transfer knowledge and results to researchers and stakeholders, including raising awareness among industry of the role of educational opportunities in attracting young people into maritime professions, and raising awareness amongst school pupils on career development opportunities at sea. Specific dissemination activities included the promotion of the project outputs through a dedicated website (http://know-me.org/), a six-monthly newsletter, various types of dissemination material and presentations at international conferences and regional events. A variety of professional and academic networks and representatives of industry, such as national ship owners associations, have supported the dissemination of project results and have proactively participated in the KNOWME network.

Network meetings and interaction with stakeholders have been taking place face-to-face, through newsletters and on Twitter. In addition to these communication channels, the KNOWME project partners initiated the ‘Go-Maritime’ LinkedIn group. Cross-linking the Go-Maritime portal and other platforms and projects has contributed to the accumulation and dissemination of knowledge even further. The ‘Go-Maritime’ LinkedIn group, the other social media and the Go-Maritime portal are also a good way to sustain and keep the KNOWME knowledge network after the end of the project.

*Policy implications and opportunities for further research*

The network meetings together with the other research activities conducted within KNOWME offer a wide range of rich messages and possible solutions for a future project in maritime education as well as future policy making and business strategy. This is needed to help Europe overcome its maritime employment deficit. Pro-active by nature, any future project will need to address the following range of challenges identified here.

Development of National Image Communicators, or ‘NIMCOS’, is required to help address the image question. Strategies are also needed to overcome the shortage of skilled labor, and address the surplus of training capacity. There is a need to better tailor and harmonize educational capacity across the EU. This requires ongoing collaboration and joint strategies. More shore-based crews could form part of the answer, and this is especially relevant for certain high labor content shipping services, such as short-range ferries. Many thousands of seafarers are employed on short-range ferries across the EU and there is already some evidence of such services shifting to more shore-based crew use. Fundamentally however there is a need to address the supply constraints relating to: 1. Training provision offered in the right places; 2. Addressing language education and cultural factors; 3. Overcoming the image issues of shipping; and 4. Ensuring Continuous Professional Development (CPD) for employees.

Cadet sail training ships represent an opportunity for early education, at high school level, to try to offer more young people a brief experience of seafarer life, through specialized training vessel sailing courses offered much more widely and at low cost than is currently the case. This type of strategy needs to be further developed at the national level, albeit with some overarching coordinating at regional level. It may be possible to build this type of early MET experience into the school curriculum, and this type of action could be included in policy approaches.

It is clear that more women nowadays wish to take a job at sea, however still a sizeable (female) resource is not being well utilized, hence any future strategy/project should investigate more ways to facilitate access to seafarer jobs for women and to overcome barriers. The issue of e.g. social costs and other financial aspects for seafarers also needs to be further explored to see if other ‘reward’ incentives can be identified. Key factors influencing retention of employees were identified including: 1. Salary, hence reward; 2. Fair and equitable treatment of employees; and 3. Access to Wi-Fi, preferably free usage on board ship. The main focus for MET in future should also emphasize: 1. Sustainability of shipping; 2. Quality of services; 3. Training; and 4. Career development. There also needs to be continued stress on use of maritime clusters involving various stakeholders to help develop and provide future MET solutions.

So, is seafaring a first world or a developed world profession? The KNOWME results indicate that the EU states have a very positive role to play in ensuring that Europe remains a strong player in the global maritime industry. However, various pro-active strategies are required to ensure EU citizens continue to play an important part in global maritime transportation. KNOWME results involving the maritime cluster therefore challenge the future, identifying strategies and new approaches for industry, and also fitting very well the Horizon 2020 program, in an effort to help the EU overcome education and training challenges in the maritime industry, and to ensure Europe remains globally competitive as far as trade and transport is concerned.

1. DSN, Germany [↑](#footnote-ref-2)
2. Centre of Maritime Studies, Hochschule Bremen, Germany [↑](#footnote-ref-3)