

# **IMPACT: Integrated Maritime Platform for Innovative Training Products**

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## **ABSTRACT**

This paper reports on the development of a network called IMPACT which has been formed to promote the results of five highly successful completed EU funded maritime vocational education and training (MVET) projects. These projects have been directly addressing particular problems and deficiencies in MVET. Their selection has also been based on the fact that they applied innovative information and computer technology methods and tools in lifelong learning of seafarers.

The paper provides a report on the quality of these novel projects including the maritime educational material developed and describes their innovative e-learning courses. The project aim to raise the standards in the European MVET, and provide the MET institutions/individuals seafarers with e-learning and novel courses and tools to improve the quality of education they provide/receive and to support the mobility of seafarers enabling them to seek employment throughout Europe and beyond.

What is significant regarding IMPACT is that it is creating an opportunity of other novel project concerning information and computer technology to be assessed for inclusion in IMPACT platform/network.

The criteria developed as part of IMPACT project and the assessment/scoring method are presented in the paper.

*Keywords: Maritime Innovative Leonardo ICT projects; Project selection, MET; IMPACT Project.*

## **1. Introduction**

The IMPACT project intends to promote the results of a number of completed maritime vocational education and training (MVET) projects which directly address particular problems or deficiencies in MVET throughout Europe, and represent innovative use of Information and Communication Technologies (ICT) in lifelong learning. Initially, IMPACT will disseminate and transfer the innovative practices developed in several selected EU Life Long Programme (LLP) projects to MVET providers across Europe in order to support their valorisation. The long term vision for IMPACT is to expand its reach and valorise other innovative ICT projects developed for MVET through its network.

The European shipping industry now faces fierce competition from the Far East, and a shortage of 27,000 seafaring officers is predicted by 2015 (BIMCO/ISF 2005, 2010, Urkmez, 2005). For the waterborne sector to remain competitive, the quality of European standards must not be allowed to fall. The project consortium believes that by raising standards in the field of European MVET, and providing institutions with tools to improve the quality of the education that they provide, the employability and mobility of European seafarers will be increased. All of the LLP projects to be valorised were developed according to international standards such as the International Maritime Organisation's (IMO) Standards of Certification, Training, and Watchkeeping (STCW). As the IMO is the United Nations specialized agency responsible for the safety and security of shipping and the prevention of marine pollution by ships, it is essential to follow the standards that they set. All the IMPACT products promote competencies specified to these standards, and some lead to internationally recognised qualifications.

The partners involved in this project have a clear vision for developing MVET in their countries and throughout Europe. TUDEV and C4FF together with other partners in this project and others established maritime education partnerships and networks called MariFuture ([www.marifuture.org](http://www.marifuture.org)) and MarEdu ([www.maredu.co.uk](http://www.maredu.co.uk)). MariFuture and MarEdu have established programmes of cooperation to improve education and training practices in Europe, and go about the harmonisation of merchant navy officers' education. The MariFuture and MarEdu networks have instigated several European and EU Funded projects to address specific deficiencies or problems in the maritime sector. IMPACT embraces these principals, and will support the development strategies that are already in place. The extensive knowledge base generated by partnerships working on maritime projects will be shared with the awarding, accrediting, and licensing bodies as well as the policy decision makers in governments and in the EU. The EU has supported many MVET initiatives and research, and it is hoped that with their continued support, the IMPACT consortium can extend its ability to address the needs of education within MVET sector.

This project addresses many European priorities, including general, specific, and operational objectives of the LLP action. The main aim of IMPACT is to gather the results of innovative 'Good practice' projects in the field of maritime vocational education and training (MVET), and encourage their use across Europe. Case studies will identify best practice in these projects, and this will be applied to identify similar projects for promotion in the future. These projects directly address current deficiencies in MVET and are developed according to international standards, and are based on the innovative use of ICT-based content and services. The

consortium has many years of experience in developing such projects. The consortium believes that ICT can improve the quality of teaching and learning in MVET, and can help raise standards and provide institutions with tools to improve the quality of their educational programmes. This way, the employability of European seafarers, and the future employability of those embarking on maritime training courses will be increased. IMPACT will identify best practice in innovative ICT based projects for MVET and promote them fully and widely to the target groups. This will support quality and innovation in MVET. IMPACT will promote collaborative projects in the field of MVET, and will set quality criteria for projects to be included in its dissemination platform. This will encourage high quality work and co-operation between partnerships and allow them to develop good working relationships with other relevant bodies working towards the same objective of improving MVET in Europe.

IMPACT is complementary to the Europe 2020 and KA4 Programmes. IMPACT will improve quality and efficiency in MVET by promoting projects which address key competencies in the sector according to international standards. Some products lead to internationally approved qualifications. Many ICT products are often both free and accessible online, which makes it possible for all interested people to take advantage of them, thus promoting lifelong learning to many different groups and facilitating vocational education. A platform for the effective exploitation of results of the LLP programme and other related sectoral projects will be created. The results of the selected projects will be disseminated at sectoral, regional, national, European, and international level. IMPACT will collate ‘best practice’ products and provide a framework of dissemination which will draw interest from the target groups, ensuring that the project results are widely demonstrated, recognised, and implemented.

The project capitalises on the valorisation experience of the partners - see for instance, [www.martel.pro](http://www.martel.pro). Many projects developed by the partners have been incorporated into MVET programmes in partner countries and beyond – see for instance [www.maredu.ro.uk](http://www.maredu.ro.uk). IMPACT will use this expertise to increase the distribution of the initially selected projects (for instance, [www.egmdss.com](http://www.egmdss.com)) , and in future the results of additional projects. The IMPACT consortium have co-operated successfully on a number of past and currently running LLP projects.

**Partners:** The partners are Centre for Factories of the Future (C4FF) – UK; TUDEV – Turkey; Satakunta University of Applied Science – Finland; National Maritime College of Ireland (NMCI) – Ireland; Spinaker – Slovenia supported by several major maritime organisations worldwide.

## 2. Project Selection Process

A review of literature shows that there are not many publications on project selection processes but there many papers reporting on performance measures (Ziarati and MacCartan, 2010).

### Quality Dimensions

Quality has been defined by many scholars (Gavin 1984; Gitlow and Gitlow, 1987 (citing the Deming Guide to Quality and Competitive Position), Mitra (1993). Quality is fitness for purpose. A product or service has to conform to specification set by the customer. Quality has

also a qualitative dimension besides its quantitative dimension like specifications and performance ratios. Generally the customers appreciate the quality of a product or service according to these dimensions. Garwin (1984) worked on the factors needed for a product or service of high quality and classified eight dimensions of quality which were subsequently revised by Gozacan and Ziarati (2002):

- Performance: performance is the basic utilization principle of a product.
- Features: the specifications are somewhat the reflection of the performance.
- Reliability: reliability reveals the possibility of defectiveness, going out of order in time, or not effectively working of a product.
- Conformance: compliance means the assurance of the defined standards relating the product or the service, and the compliance with standards.
- Durability: durability is the usage of the product until it completes its shelf life.
- Serviceability: service capability is the service possibilities, repair time, easiness of repair, determining the complaints regarding the product, and taking care of them.
- Aesthetics: aesthetics express more relative concepts, such as the appearance, smell, and colour of the product.
- Perceived quality: the perceived quality is the views and comparisons of the customer regarding the product or the service.

### **Quality Characteristics**

To make the quality measurable and demonstrable, quality characteristics should be technically grouped. At this point, customer or the consumer is to declare his expectations and the producer is to ensure quality. After all, quality is formed by the intersection of the criteria both parties (namely the customer and the producer) put forward (Siha and Wilborn, 1985).

A customer who is satisfied is the one who obtained the expected quality. Otherwise, s/he loses her/his trust in the producer's quality and product responsibility is reviewed again.

### **Quality of Design**

Establishments in search of quality have to consider certain quality types. Gitlow and Gitlow (1987) talks about three basic quality types to produce a qualitative product or service. These are: Design Quality, Quality of Suitability and Performance Quality.

Design Quality or quality of design comprises even the most trivial conditions of a service or product to meet the needs of the customer. This means that the product or service has to be designed so that it can also meet the insignificant wishes of the customer. Quality of design begins with market demand survey and sale and continues with determining a concept of quality of a product or service. Then, specifications are prepared for the concept of a product or service.

From the arguments put forward by Gitlow and Gitlow in 1987, it seems that market demand survey, what considered important then, has not been taken seriously by many companies and the design and production philosophy has been to some extent still based more on 'push' systems than 'pull' hence they must have ignored the suggestion made by scholars such as Gitlow and Gitlow.

Learning from the previous research in related areas and several papers reporting on research in academia (Gozacan and Ziarati, 2000, 2002) and using Gavin quality dimension concept, a decision was made to define good practice and developing a set of quality criteria for the selection of project for inclusion in the IMPACT platform.

### **Good Practice**

In creating a resource based on-line portal for the promotion of a number of completed maritime vocational education and training (MVET) ICT products, developing a framework for good practice is essential. In its development a number of advantages will be addressed, such as, increased accessibility, storage and distribution of resources, reliability and ease of communication. The intention is for the website to achieve a high level of educational value, in terms of assisting life-long learning objectives for the maritime community in Europe, the web portal will be tailor made to the specific needs of this user group.

In this initiative, a good practice is defined as a practice that offers solution to an identified problem or deficiency or introduces or defines a new problem or deficiency. For an MVET ICT project or product to be selected as a good practice a set of criteria needs to be met.

*NB: The term product in the following criteria means a product or a service.*

### **Good Practice Criteria**

For an MVET ICT project or product to be selected as a good practice the ten quality criteria that need to be met:

#### **a. Performance:**

How has the product been performing? Performance here for instance means how the product is viewed by the user target group or acceptance by a recognizable external body such as an awarding organization, an accrediting body or a licensing authority?

#### **b. Benefits:**

What are the tangible benefits achieved by the launch of the product?

What are the intangible benefits?

**c. Features and Novelties:**

What are the main features of the product? Features here for instance mean that is available online as well as on DVD and is it supported by learning guidelines/materials and so forth. Or, for instance, what technologies do you apply that can be considered as a special feature of your product. Identify novel aspects of the product.

**d. Reliability:**

How 'IT reliable' is the product? For instance, has it failed before for known or unknown reasons?

How 'professionally reliable' is it? For instance, if not already accepted by a recognized body, how can potential users be assured that the content is valid (correct), current (up—date) and covers the range (of topics/subjects)?

**e. Serviceability:**

How is the product serviceable? For instance, if there is a problem, is there helpline to assist? Would it be up-dated in the future and so forth?

**f. Ease of use:**

Is it easy to use? Give supporting evidence on user-friendliness of the product? What identifiable measures has been taken into consideration to make it user-friendly?

**g. Number of users:**

How accessible is the product and/or many people are using the product, or if new what is the potential number of users?

**h. Accessibility:**

How accessible is the product? What facilities have been provided to ease access?

**i. Conformance:**

How did the product conform to its specifications? For instance, comments and/or the grade awarded by the external funding body or their agent/assessors.

**j. Maintenance/Enhancement:**

How is or do you intend to maintain the product you have developed?

### **3. Submit Good Practice**

Interested parties may submit their product or service for evaluation at any time. All submissions will be evaluated against the IMPACT Good Practice Criteria as published on this website.

The criteria are graded using the Likert Rating Scale from 1 to 5 to assess each award criterion. The scoring system is defined as follows:

- |                |   |
|----------------|---|
| 1: Very weak:  | Significant deficiencies                                  |
| 2: Weak:       | Addresses the criterion but with some weaknesses          |
| 3: Acceptable: | Addresses the criterion satisfactorily                    |
| 4: Good:       | Addresses the criterion with some aspects of high quality |
| 5: Very good:  | Addresses the criterion with all aspects of high quality  |

The total score for the project is the sum of the scores given to the 10 main performance criteria. The maximum total points that a product or service may obtain is 50.

Using the good practice criteria, the minimum total points that a product or service may obtain to successfully be accepted in the IMPACT network is 30. The product should also score 3 or more from the each criteria.

### **4. IMPACT Selected Projects**

The intention of IMPACT platform is to assess and score the chosen products based on the criterion based assessment used. If the product is able to score more than 30 out of 50, then the product will be promoted in IMPACT platform as “good practice” product for the consideration of potential users.

There are currently 5 products chosen that were assessed. Those products are the ones that have already been scored highly by EU commission. They are MarTEL (2007-09), MarTEL Plus (2010-12), EGMDSS (2006-08), EGMDSS-VET (2008-10), MarEng (2004-07), MarEng (2008-10), NetOSKAR (2003-05) and MEP (2008-10). All existing products of IMPACT were studied, assessed and scored highly by IMPACT experts using the criterion based assessment and the product is now part of IMPACT platform. The rationale behind initiating each of the 5 projects and products are as follows:

#### **4.1 MarTEL and MarTEL plus: Maritime Test for English Language**

The product MarTEL was initiated in response to lack of English standards at both international and European level (IMO’s MSC 82 meeting in 2006). It was noted at IMO’s MSC 82 event that current English language standards and the maritime English model courses (IMO 3.17) as well as SMCP (Standard maritime communication phrases) were no longer adequate. According to recent researched, almost 80% of accidents at sea are caused by human error, nearly half of which are attributed to communication failures among the crew (Ziarati, 2006).

MarTEL Plus product was initiated in response to the revision of the STCW (2010); to develop a set of maritime English tests for Ratings including guidelines for teachers, more comprehensive speaking test and a mobile phone practice tests.

#### **4.2 EGMDSS and EGMDSS VET: Online GMDSS products**

IMO added the GMDSS (Global maritime Distress and Safety System) requirements on 1 February 2002 as part of changes made to STCW 95. The requirement was introduced by IMO as there was a need for many GMDSS operators certified by responsible certification bodies to ensure they are competent in using the new technologically advanced GMDSS equipment. However, there were not sufficient resources to train the seafarers with new GMDSS equipment.

In response to limited learning materials, two online platforms were developed for EGMDSS, one for Short Range ([www.egmss.com](http://www.egmss.com)) and one for Long Range (also at [www.egmdss.com](http://www.egmdss.com)). They both comprise a complete set of learning material for Short Range Certificate and Long Range Certificate respectively including a range of simulators of commonly used GMDSS equipment. With these online simulators and professionally produced tests, users can learn about VHF radio, NAVTEX receivers, SART and EPIRB. The access to e-learning material is free and available in many languages.

All mariners must obtain the appropriate type of GMDSS certificate. EGMDSS VET was targeted at MET institutions. IMPACT will build on this project by allowing it to be more widely disseminated to its target groups, allowing it to become more widely used.

#### **4.3 MarEng and MarEng Plus: Web based maritime English learning tool**

The MarEng project was initiated to develop content for Maritime English. Special knowledge for operating in the European common labour market was needed especially in seafaring where the official and widely used working language is English. The learning tool consisted of materials for only at intermediate and advanced levels.

Upon successful completion of the MarEng product, MarEng Plus project was initiated upon the feedback from the MarEng learning tool users that there should be a similar material developed for Ratings. To this end, the latter project developed learning material in line with English language need of Ratings.

#### **4.4 NetOSKAR: Assessment tools**

NetOSKAR product was developed as an assessment tool, in line with the contents of the International Maritime Organisation's STCW 95 (Standards of Training, Certification and Watchkeeping). It was created by an international network of experts from major European MET providers and Shipping companies. The NetOSKAR LLP project promotes vocational training, learning and competence evaluation for seafarers with a knowledge development and assessment tool. The feedback from this project was encouraging, and the project gained a substantial interest among international shipping communities and the International Maritime Organisation (IMO).



The product is used widely by the international training community, especially pilots and VTS operators. The product uses OSKAR-method (OSaamisen=Knowledge, KARtoittaminen=Assessment).

#### **4.5 MEP: Maritime Education Platform)**

A study by MariComp indicated that lecturers at maritime institutions need to update their knowledge continuously based on the argument that there is always room for improvement (Hundahl, 2007). IMEC Chairman stressed the need for investing in maritime training. A Dutch newspaper with a plea of Dutch minister of education suggested more structure in education by means of the internet and more cooperation between educational institutions.

The MEP initiated an improvement action for maritime education, using the internet and encouraging cooperation among the partner organisations. The MEP product includes the knowledge and skills on several maritime subjects and is available on line facilitating knowledge to be shared worldwide.

### **5. Conclusion**

The IMPACT project, as reported in section 4, is promoting several EU funded and completed Leonardo 'Transfer of Innovation' projects which are on various aspects of information and computer technology subject areas. These projects were used to develop and validate a scoring and grading system for selection projects as shown in Table 1. The table shows the grading by one of the partners only but the actual table has similar columns for other partners. There are only five projects named project 1 to 5 but there can be many more assessed one-by-one or a cluster using the IMPACT quality criteria.

The project has used the results of previous projects developed in manufacturing sector to develop a set of criteria for selected Leonardo projects. The scoring system is also based on an existing system viz., Likert Rating Scale. The collaborations among partners is very effective and all initial five projects have been rated and based on this assessment the IMPACT quality criteria are expected to be reviewed and the scaling revised.

The IMPACT project will be concluded in November 2012 and the final report will be presented at the project final group meeting and conference in November 2012.

For more information about IMPACT please refer to [www.maritimetraining.pro](http://www.maritimetraining.pro).

**Table 1. Performance Measurement IMPACT - Products and Services**

Criteria	Likert Scale 1-5	To-achieve Best Practice	C4FF				
			Project 1	Project 2	Project 3	Project 4	Project 5
<b>Performance/ Recognition</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	Users target group (s) and/or awarding body views the product positively and acceptable.	3	3	3		4
<b>Benefits</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	All tangible and intangible benefits (deliverables/outcomes) have been achieved.	4	4	3		5
<b>Features /Novelities</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	All features of the product are present and supported by guidelines or learning material or technologies used were the main features are considered state of art or novel.	4	4	3.5		5
<b>Reliability</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	Product is reliability both in IT term and content term.	4	4	3		5
<b>Servicability</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	The service issues of the product have been taken into account and the product can be serviced and up-dated.	4	3	3		4.5
<b>Ease of Use</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	There is evidence that ease of use is taken into consideration and that the product is user friendly.	3.5	4	3		4
<b>Number of Users</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	The product is used or expected to be used by the user target group (s).	5	5	4		5
<b>Accessibility</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	The product can be accessed by the user/target groups.	5	5	4		5
<b>Conformance</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	The product satisfied all its specifications and if the were variation these were justified.	4	3.5	4		5
<b>Maintenance/ Enhancement</b>	1 : Very Weak 2 : Weak 3 : Acceptable 4 : Good 5 : Very Good	There were steps and plans to make sure the product is developed and maintained.	5	3.5	3		4
	<b>TOTAL SCORE</b>		41.5	39	33.5	0	46.5

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He is the coordinator of the MarEdu and MariFuture networks. He has undertaken coordination activities for a number of EU funded projects. He is presently the project director for six ongoing EU funded projects including two Maritime English focused projects: MarTEL Plus and CAPTAINS. C4FF lead the MarTEL Plus project which intends to establish International standards for Maritime English with a total of 22 EU partners.

He has written a number of International referred papers in the area of Maritime English. He has also had written a number of articles printed in International maritime publications in the area of Maritime Communications. He is a member of the Excellence Club, represented by leading innovative companies in the region and a personal member of the EU Research and Development funding group, both established by the regional development agency.

He is a Working Group Member, MILC Technology & Innovation Group, MILC (Marine Industries Leadership Council (UK's forum for the industries' key stakeholders supporting UK Government Policy Making)

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He has written a number of International papers in the area of Maritime training and education including Colregs. He has dual Unlimited Certificates of Competency, one from UK and one from Turkey. He has two years experience at sea as merchant navy deck officer and junior officer serving Oil, Container and Bulk carriers. He has also been involved in mentoring Turkish students at Glasgow Collage of Nautical Studies, UK.

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