Developing a System for Recognition of Work-Related Skills and Learning Outcomes

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Abstract: Formal and non-formal education is subjected to continuous research for providing effective ways for improvement and recognition of competences. Several recommendations are formulated by decision makers for encouraging researchers to provide solutions for promoting education focused on learning outcomes and the recognition of work related skills. This paper aims at developing a blended learning system and analyzing the opportunity of implementation for vocational education and training. The system was developed for the marine sector and comprises modules created for soft and technical skills' improvement and assessment. The survey was conducted to identify the set of skills required by the end-users. The survey was developed with questionnaires tailored for particular categories of respondents. Following the survey, the focus groups with marine professionals were organized to identify methods for skills recognition. The results concluded in an E-platform for Blended Learning constructed to allow participants to improve their knowledge and gradually self-assess the level of achievements. Becoming acquainted with the particular skills and competencies, the participants could apply for the final test. On successful completion of the course, a certificate would be awarded in recognition of the achievements. The results of the study represent a validated instrument that can be multiplied for recognition of the work-related skills and learning outcomes in various knowledge areas.

Keywords: *employability; soft skills; marine technical skills; skills recognition; e-learning.*

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1. Introduction

According to the European Commission (2012) publication “Rethinking Education Initiative”, in order to build skills for the 21st century, efforts are needed to develop soft skills to enhance employability. Soft skills acquisition appears to be essential for flexibility and security of current and further employees. The right skills offer people the potential and confidence to carry out good quality jobs. As pointed out in the communication from the European Commission (2016), “New skills agenda for Europe”, 40% of European employers have difficulty finding people with the skills they need to grow and innovate.

Training institutions concern about providing the most appropriate curricula that will respond to the trainees’ needs. For this purpose, researchers care about updating the teaching curricula to offer teaching materials focused on learning outcomes. Cooperation with business/industry brings value by ensuring relevance of methods and technologies used in training, as specified in European Commission’s (2012) staff working document, “VET for better Skills, Growth and Jobs”.

Continuous professional development (CPD) is also considered by the employees a success factor for their career. During the “Maritime Skills Roundtable Discussions” organised by professional association IMarEST, Institute of Marine Engineering, Science and Technology and the global recruiters MatchTech (2015), for the purpose of “mitigating the skills gap in the maritime and offshore market”, the participants discussed “employees’ receptivity to professional development”. The results shown that 86% of the individuals viewed CPD an important factor for the development of employees. According to the same study, 92% of organizations agree that professional development is important for the development of staff. Professional associations counsel the members to plan and record their actions to demonstrate how they improved their skills while working. The use of templates, simple or more complex, is highly recommended and encouraged. These are used for guiding professionals to plan structured and unstructured activities to achieve their goals. Although, people still appreciate a diploma certificate rather than work experience over the years (Soenarto & Mardapi, 2017).

The aim of this study is to analyse the requirements for developing a blended learning system for skills improvement and recognition of work-related skills and learning outcomes.

The importance of developing a collaborative research among key stakeholders in education and learning is emphasised through this research.

2. Research Methods

Acknowledging that the “set of right skills” is the key for further development, this study included the identification of the required skills for marine sector. For this purpose, the research started with defining the target group and later on, the main categories of marine professionals:

- Learners (students, trainees) with or without sea time experience, Marine personnel (employee, marine professionals) working onboard or ashore,
- Lecturers (professors, instructors, trainers) teaching marine specific subjects or fundamental subjects,
- Career advisors,
- Recruiters,
- Employers.

Questionnaires have been designed according to each category of respondents and comprised of filtering questions, multiple choice questions and open ended questions. This approach allowed collecting opinions on the same topic as perceived by different stakeholders; e.g. motivation factors for employees, skills to increase chances of employability, etc.

3. Findings

The survey consists of a total of 211 completed responses from Netherlands, Romania, Bulgaria, Portugal, Greece, Italy, UK and unknown as depicted in the figure 1.

Fig 1. Distribution per country

The distribution per group of respondents is presented below:

Table 2. Distribution per category of respondents

Group category	No
A1 Learners with sea time experience	54
A2 Learners without sea time experience	35
B3 Marine personnel working onboard	18
B4 Marine personnel working ashore	34
C5 Lecturer teaching marine specific subjects	40
C6 Lecturer teaching fundamental subjects	14
C7 Career advisor	0
D8 Recruiter	6
D9 Employer	10

The results of the survey have been collected between 14th of February – 10th of March 2017. The responses have been analysed and the results were summarized in the DivSea Marine Survey Report, (Acomi, Saxton, & Krock, 2017).

Three topics were selected from the detailed findings as appropriate to respond to the target group needs. These refer to:

- knowledge areas that would help in future career progress, figure 2.

Considering the significant percentage of respondents and the attractiveness of marine engineering sector, the following areas have been selected: Marine environment – Ships energy efficiency, Marine and cargo survey and Ballast water system operation.

Fig 2. Attractiveness of marine sectors

• the most relevant soft skills for coping with the career, figure 3. According to the skills reported by the majority of the people surveyed, the selection included: Effective communication, Leadership skills, Team working skills and Problem solving.

Fig 3. The most relevant soft skills

• factors that could increase the chances of employability, Figure 4. A large part of the people surveyed stated that they needed assistance for preparing for an interview, and properly write a CV & Cover letter.

- CV & Cover letter writing
- Preparing for interview
- Job research (including online social media)
- Networking
- Mentoring
- Career guidance/consultancy
- Professional behavior

Fig 4. Factors that increase employability

The next step of the research was to organize focus groups aiming to agree on the methodology for elaboration of learning and assessment materials. In this scope, the “Training course for instructors” elaborated by the International Maritime Organization (2001), was considered for structuring the course framework.

3. Discussions

The partial results of this research are represented by the identification of marine professionals’ needs for diversification of career pathways. This approach allowed researchers to develop relevant learning materials, for the following subjects of interest: career guidance tools, soft skills and technical skills.

Researchers collaborated to adopt a unitary system for developing the learning materials. The courses and assessment tools have been integrated in an E-Platform for blended learning <http://divsea.cmu-edu.eu/>, presented in Figure 5.

For the attractiveness of the presentations, several types of versions were taken into account. Therefore, Power Point Presentations, text

documents in Word, presentations in Beamer and Prezi presentations were analysed from advantages and disadvantages perspectives. The power point presentations were considered suitable, easy to be used by trainees and compatible with Moodle platform.

The evaluation system has constituted a subject for debates. The choice of Moodle platform as instrument for online learning, influenced the decision made with regards to assessment. Based on trainers' experience to elaborate tests and considering the facilities provided by the Moodle platform, the multiple choice questions have been selected as appropriate. Guidelines and recommendation for the construction of multiple choice questions (Clay, 2001; Kim, Patel, Uchizono, & Beck, 2012), have been taken into account for the elaboration of intermediate and final tests. The summative assessment allows self-evaluation of the level of knowledge at the end of each unit.

Fig 5. Moodle E-Platform for Blended learning

Courses were designed to gradually allow trainee to view the learning materials. It means that the trainee has access to the first module, then to the associated test. Figure 6 highlights the conditions set for the availability of learning materials:

The test would be available only if the previous module has been completed by the trainee. Continuing in the same manner, further modules would be available only if the trainee achieves a required score.

Fig. 6 Conditions set on E-platform

Fifty percent passing score will make available the next training module and associated test, then gradually to the next modules and tests. There is no time limit for reading. The trainees are invited to read at their own pace, even to close it and re-open when they are prepared for studying.

On completion of the modules and intermediate tests, there is a final test. The passing score for the final test is 60%. Achievement of this score would provide an understanding of the subject, the final test comprising 40 questions selected from various modules.

The platform has been set up to award the certificate in recognition of acquired skills and competencies and the trainee to be able download it. Moodle allowed designing the certificates and assigning individual codes for the issued certificates.

5. Conclusions

The process of developing the model for recognition of learning outcome and work related skills was fundamentally based on the expertise of researchers and trainers. The survey conducted for this study constituted the key factor for further development. The data collected revealed the expectations of different categories of stakeholders involved in the marine sector. Analysis of needs directly impacted the relevance of the E-platform for blended learning. Therefore, the modules were chosen to address those skills considered by stakeholders to improve the employability. Teaching

approach and competencies of trainers to designing course modules and associated tests give the measure of the quality in education.

The developed model can be implemented for vocational education and training in various sectors, other than the maritime sector. The efforts to involve the main factors as employees, employers and trainers offer a clear identification of needs that will impact to the relevance of the final result represented by the E-platform for blended learning.

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7. Disclaimer

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