Work in progress: E-Learning Impact on Romanian Maritime Education

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Abstract - The introduction of modern technologies in the education system has been a main concern of all Romanian education institutions. This paper describes the preliminary developments of a Leonardo da Vinci European project that involves creative pilot programs for junior officers on board tankers. The paper discusses also the project plan and the main steps in which distant learning are being implemented in the maritime training modules. Finally, the paper outlines the preliminary results regarding web enabled simulation as a new tool for learning, training and assessment of students.

Index Terms –Distant simulation, e-learning, Maritime simulators, Maritime Education and Training (MET).

1. INTRODUCTION. PROJECT OBJECTIVES AND OUTCOMES

The development of simulation techniques makes apprenticeship of the cadets very close to reality. As in other technical work systems, expertise of workers in the maritime domain is declining as a consequence of true apprenticeship experiences. While the complexity of work processes on board have enormously increased due to factors like:

- Automation of ships functions;
- Reduction of crew sizes and
- Multinational crew composition,
the performance of nautical and also technical officers draws on a considerable amount of procedural and conditional knowledge. Nevertheless the listed factors above obstruct both direct and indirect experiential learning, that is, in other words, learning by doing and learning by communication as keys to practically acquire the procedural knowledge of “good seamanship” and to attain conditional event knowledge derived from personally experienced (possibly social shared) action episodes.

The aim of the European project with a running time of 30 months is the development and implementation of a solution strategy for the lost apprenticeship dilemma of entry-level nautical officers in Europe [1]. Although the problem increasingly concerns the maritime transport industry in all of its branches, the main emphasis in the project is focused on tanker operations where seafarers must handle explicitly dangerous cargo. The solution strategy which shall be achieved has to consider the three components of experiential learning (on board), advanced distant learning technology (on board and ashore) and formal teaching or training in the classroom or in the simulator, respectively (ashore).

The main idea of the project is that maritime education and training has to be anchored and (re)located in the work process on board. On this background the establishment of networks for cooperative knowledge and experience management (between maritime training institutions and shipping/tanker companies) is of great importance and will be recognized in the national project syndicates.

A central effort in the project will be the implementation of an internet based infrastructure for distant learning and tutoring that can be used for the distribution of courses tailored to offer guidance for investigative learning but also theoretical reflection of personally experienced tasks and events. Central to the project is also the identification or creating of practical authentic tasks with high experiential learning potential for newcomers in the domain.

The outcome of the project will be a total package of e-learning programs for Tankermen. These programs will be certificated courses based on e-learning or web-enabled simulation. The project consortium consists of four Universities in Germany, Portugal and Romania, one Norwegian simulation company and seven tanker shipping co.

2. PROJECT PLAN AND MAIN STEPS

The work program is derived from IMO model courses. The instructional design will be accomplished for three courses:

- Tanker familiarization (TA 101E)
- Specialized Training for Chemical Tankers (TA 104E) and Training for Oil Tankers (TA 102E)
- Specialized Training for Liquefied Gas Tankers.

In production oriented perspective the total work steps will be divided into 6 phases:

1. Preparation
2. Instructional design Tanker Familiarization
3. Instructional design Oil/Chemical
4. Instructional design Gas
5. Online-assessment
6. Certification/ Transfer

In the instructional design process (steps 2, 3, 4), courses will be based on theory, simulation and on-board-practice. Furthermore, within each instructional design process (steps 2, 3, 4) five sequential tasks have to be executed (milestones):

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• Need analysis: Determination of relevant on board experience, formal instruction and simulation training contents. Here the participation of experienced job experts working for the ship companies in the project consortium will be necessary. Their experience knowledge is addressed by expert workshops, written questionnaire or interviews.

• Conceptualization: The conceptualization of courses involves intense cooperation between institutional partners, ship companies and the training simulation technology enterprise in the project.

• Realization: Each institutional partner will carry out the instructional design of one model course. CMU will have the technical leadership for the developing of the Chemical/Oil tanker course.

• Testing (formative evaluation): This means checking the constitutive components of the instructional system and the net based simulation training. Formative evaluation considers:
  i. Validation through experts (user conferences, members of the board etc.)
  ii. Peer evaluation (other member of the consortium)
  iii. Competence and performance measurement
  iv. Comparing evaluation (control group design).

• Optimization: This will be fulfilled depending on results of testing. Here products and concepts are submitted to optimization and adjustment.

3. CURRENT PROJECT STATUS AND RESULTS

Our current developing phase is the Oil/Chemical instructional design process/conceptualization and realization tasks. Some of the project recent results are as follows:

• Need analysis reveals hints that the identified experiential learning tasks are valid;
• All partners have got Neptune Liquid Cargo Handling desktop simulators licences for Product carrier/Chemical/LPG/LNG and also the e-Coach software for running the simulator exercises with assessment features (see Figure 1).
• The menu/content of the familiarization course and the simulator based exercises are completed.
• The decision about Learning Management System (LMS) has been taken by the Norwegian partner. The project consortium will use the ILIAS open source software.
• After installation of LMS, next step in the near future will be the implementation of the files and testing the content (theory and exercises).
• Finally, the assessment of the technology effectiveness being implemented and also how the technology will affect the students’ learning.

FIGURE 1
EXAMPLE OF POP-UP E-COACH MESSAGE DURING AN E-LEARNING EXERCISE

FIGURE 2
EXAMPLE OF EXERCISE RESULTS FOR TOPPING OFF EXERCISE

4. CONCLUSIONS

The paper describes some of the technologies and tools that have been incorporated into the maritime training program. In spite of there is no assessment of the impact of the project on students’ learning, on our view, distant learning combined with simulators makes a new and flexible training approach possible. Therefore, we can finally consider that e-Learning has a positive impact on Romanian maritime education and moreover learning combined with training will be by far the most effective way to increase skills and competence in the near future.

REFERENCES

