



USING MULTIMEDIA FOR ELECTRICAL ENGINEERING INTO MARINE EDUCATION

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ABSTRACT

The paper presents some implementing results of the new technologies concerning electrical engineering marine education. Introduction and development of the new methods and modern techniques simultaneously with conventional education systems, represents the first step in implementing of the Open and Distance Learning in the Romanian Marine Education. Our experiment consists in the use of the audiovisual resources and information technology, to improve both theoretical and practical teaching of the electrical and electronics marine curricula. The purpose of this experiment is to create the possibility of an autonomous, independent and interactive instruction constituent, very important for the student's education. In the training process, many software programs for electrical curricula were created, intended for testing knowledge and self-testing of the students.

OBJECTIVES

The main objectives of our experiments consist in:

- The elaboration of some computer software for testing and self-testing for students from Electrical curricula using the radio communication standard vocabulary.

- Using multimedia tools to improve theoretical and practical teaching of the marine curricula for education.
- The learning of the technical English terms of radio communication, to elaborate a catalogue of international abbreviations in this field.

METHODS

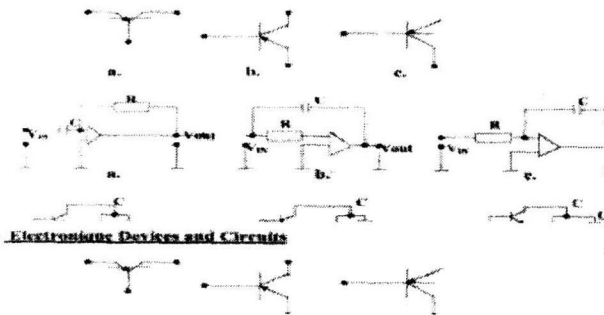
The first step in our experiment was to create a computer software for testing and self-testing in evaluation of the level of knowledge assimilated by the students. For this purpose there have been drawn up inventories for several theoretical curricula, containing the main definitions, theorems, concepts that make up the elementary knowledge that should be assimilated in order to pass to the superior level of study. Each item is evaluated specifically.

These evaluation qualifiers help students in their self-evaluation and the teachers in testing student's knowledge.

The Science Inventory has been drawn up for the following curricula:

- Electro techniques
- The G.M.D.S.S. equipments, procedures and operations

- The Microwave Techniques
- The abbreviations in English frequently used in maritime radio communication



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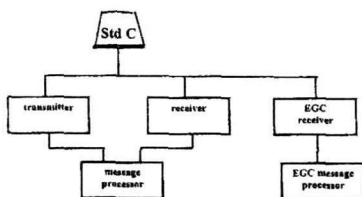
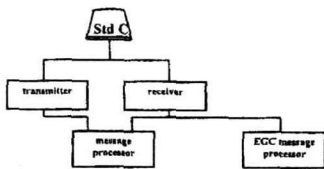


FIGURE 1. PRACTICAL TESTS - EXAMPLE

Another step consists in introduction of multimedia tools and audio-video methods in education. For more complex curricula, like the Microwave Techniques, where a sophisticated mathematical device is used, special recordings of certain lectures were made on videotapes. These videotapes can be

played or copied by those interested and can be use in Distance learning also.

Maritime radio communications and their equipment are of an outstanding importance in establishing contact within the ship itself between the ship and other ships, between the ship and shore stations, with Harbour Authorities and also with private persons, but communications at sea are essential in case of danger or distress. That is why our University has the latest simulation equipment available for the students, to supplement their training at sea, electronics navigation laboratory and a Global Maritime Distress and Safety System Simulator. The GMDSS establishes in details all regulations concerning the standards of equipping the ships, the training of the personnel and their responsibilities on board ships, the protocols used in different types of communications.

In the effort to meet this need, greater use has been made, in recent years, of instructional films, video cassettes and tape slide programs, to provide fresher and updating training on a variety of topics for students, master graduate officers and other personnel serving on board of ships.

Though the Maritime University of Constanta owns a training ship, the equipment is limited and the equipping of the ship can not be constantly updated. Further more, the graduate will be employed on ships equipped with a large diversity of navionics belonging to different generation of technologies. The graduates, especially those from the secondary marine education, should master not only the operational ways of the equipment but also their maintenance. They should be able to fix the most important and frequent damages that may occur during operation.

The assembly of the equipment is filmed on tape, as well as the way they are placed on board ship, control room, chart room, and

main bridge. Then each equipment is presented in details.

All the explanations of the component's part and their functioning are in Romanian and English language. Once again the maritime terminology being used currently and in order to test their understanding, each description of a certain equipment is followed by a set of questions, along with the correct answers and different practical skills. To sum up, we are trying to make our testing techniques a mirror of students real standard.

The videotapes registered on board NEPTUN - the training ship of the Maritime University Constanta, contain the existing equipment on board of this ship and all the explanations regarding their operation.

It is used for completing both the equipment courses and the training period on board NEPTUN. Besides the videotapes illustrating the functioning of complex marine systems, as the GLOBAL MARITIME SAFETY AND DISTRESS SYSTEM, computer animation was also used. In software production, computer animation must be as suggestive as possible and must present as accurately and simply as possible the functioning of a complex system or of an equipment.

We have developed in our department some of this software with our students, during the completion of their diploma works, based on the previous projects and English documentation.

Another target of our experiment was to develop the modern methods for teaching our students Maritime Terminology.

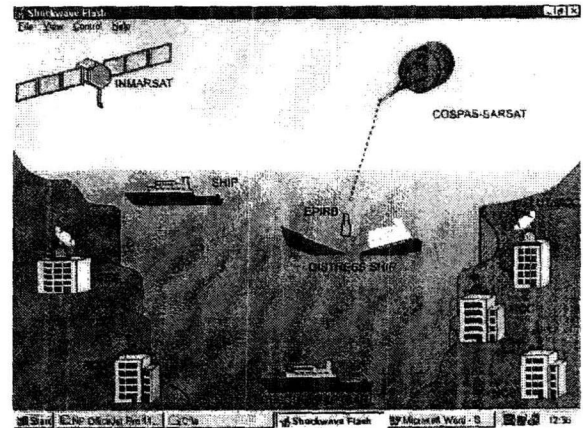


FIGURE 2. GLOBAL MARINE SAFETY AND DISTRESS SIMULATION

Responding to the fact that English is the language of all international maritime activities and a means of communication for seafarers all over the world in order to survive on their travels, the English language, as a subject, is attributed a special importance in the Maritime University of Constanta.

Consequently, as navigation and safety communications must be precise, simple and unambiguous, so as to avoid confusion and error, there is a need of standardization of language and terminology at sea. This would contribute to greater safety and the phrases and terms provided by the vocabulary would be gradually assimilated by those using them.

The endeavours of the two departments of our University, the Electronics and Computer Science Department and Foreign Language Department have as main purpose the acquirement of the technical terminology for radio communication in English by promoting a successful learning for all our students.

The knowledge and skills of a maritime officer need constant improvement. It is justified by many reasons but the most important is the safety of people working at sea. When struggling to understand a

thoroughly garbled radio message we realize the importance of a vocabulary of maritime terminology that every maritime student should master.

Starting with the final years of study during the Radio communication, Radar, Radio Electronics Equipment classes and laboratories, the abbreviations, the equipment and their component parts are defined in English.

Rapid advances in radio communication technology have led to an increase in specialist subject areas, each of which has engendered its own set of abbreviations. We have to learn the various abbreviations used in communications at sea. We have difficulties in tracing the abbreviations, as we could find no specialist reference book dealing with abbreviations used in radio communication. In order to bridge the gap we started collecting the abbreviations. We found this to be a fascinating project of unbound proportions.

The areas that we investigated here were mostly Radio Electronics and Communication. Thus for GMDSS system a table has been compiled with the abbreviations in English frequently used, and then currently practiced during the classes, laboratories and practical training.

In conformity with the International Regulations of Radio communications a Seaspeak Vocabulary in English has been made up including the abbreviations used in communications, incident messages for distress, urgency, safety or minor incidents and standard messages, dangerous cargo messages, way point messages, anchoring messages, clearance messages, change of channel messages, first contact messages, arrival messages, ETA messages, Pilot request messages and communications preceded by urgent or the safety signals.

All these are exemplified and then practiced by the students both during the seminar classes and during the practical training period in laboratories or on board ship.

Both the Seaspeak Vocabulary and other notions and texts referring to the systems and Radio communications Equipment form the object of exercises during the English classes.

In this respect the collaboration between the teachers of the above mentioned departments is very important as they have to agree when making up the analytical syllabus for the English classes.

Another way of making the students learn the specific terms concerning radio communications in English is in asking them to accomplish annual projects using English documentation. It is essential for them to master the improved techniques and methods of seamanship so that the ship can be handled more skillfully economically and safely in the future and without a proper knowledge of the maritime terminology this could not be possible. So, by individual studying our students can acquire and learn technical terms of radio communications and at the same time get accustomed with their English meaning.

Some of the projects have been accomplished by our students and our master graduates within the subject Naval Radio electronics Systems by succeeding to do computer programs, simulating radio equipments, radio beacon EPIRB and radar transponder, INMARSAT Communication Systems.

Computer programs for testing and self-testing for our students have also been carried out within our departments mainly for the use of the Seaspeak Vocabulary.

RESULTS

Audio-video methods proved to be extremely attractive for our students with very good results as both their technical and English knowledge could be tested and evaluated. These methods make learning effective and attractive.

Using videotapes to learn about some complex equipment that can not be entirely exhibited in laboratories, is an efficient and economic technical way in education. The use of videotapes and computer animation during classes and laboratories proved to be a very attractive method for the students, a dynamic improvement in education. These combined methods of presentation have increased the student's interest in attending the courses and laboratories. This has been observed in getting better grades in the final evaluation.

CONCLUSIONS

The encouraging results obtained in the final tests by our students give us the right to think that the use of multimedia tools, audio-video methods, computer programs testing and self-testing along with the self studying, regularly checked by the teachers during the electrical classes must be constantly improved, diversified, and extended to other subjects studied in the Maritime University. Also the interactive methods prove to be very efficient and they have to be developed widely in the future. These methods are in fact a first step in implementing Distance learning in our University.

So, the end result is a well-educated graduate of an interdisciplinary curriculum who meets the needs of international maritime activities.

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