

TRENDS IN DEVELOPING MODERN CURRICULA IN MARITIME EDUCATION

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ABSTRACT

In a rapidly changing world and a swiftly evolving technology, ideal education curricula are impossible to achieve. What education can do is to provide the basics and teach a methodology of self-development. It is extremely important to find ways to meet the requirements of the new economy.

In other papers, I argued how modeling method in maritime education could be a scientific solution to a better understanding and, of course, for best solutions of the problems arise. For example, I obtained very good results using modeling in maritime transportation (Constantinescu, 2000).

In this paper, starting from an existing maritime education modeling chart and in accordance with the future needs of the maritime education, we define and analyze the main steps in maritime education modeling: description of actual curricula, identification of goals, correlation with general educational models, recognition of job requirements, development of a local curricula which individualizes maritime education, development of aid curricula, development of initial and continue training, prepare for life-long learning. Then we analyze the stages of the development of a new system and also maritime educational measurement and evaluation.

In order to obtain a better standard of maritime education, some important measures have to be undertaken to ensure that more modern curricula are developed. Our proposed model allows the development of new education structures or the restructure and modernization of existing curricula. Its chain structure provides also very important feedback information.

1. Introduction

Generally, curriculum development in education has become one of the most important issues for academic institutions concerned about the quality and effectiveness of their courses in an era of rapidly changing technology and production processes. The modeling method, which has been successfully used in diverse activities, could have a strong impact on maritime education. While the broad technological progress, which has taken place over recent years, has caused a great need for technology education, the existing educational structures have not developed at the same rate. Therefore, the modeling method in maritime education could be a scientific solution to a better understanding and, of course, for best solutions of the problems arise.

In many applications models are necessary. The term "model" is usually used for a structure, which has been used purposely to exhibit features and characteristics of some other objects. Generally only some of these features and characteristics will be retained in the model depending upon the use to which it is to be put.

The modeling method is built upon a mental activity, which allows one, through several logic operations, to process previously obtained information in order to create a theoretical model. This developed model is then reproduced as a practical model with which to experiment. The practical model reflects all theoretical functions and interactions, which can be easily performed, controlled and measured during an experiment.

The experimentally obtained results are essential to assess the practical model and to develop further or improve its status and features. After this process, the improved material is ready for next trial, which in this case is a large-scale experiment. This process can be repeated satisfactorily for several consecutive steps. After a number of iterations the final version of the model is reached.

Some models are concrete, but more often are abstract models, especially in operational research. These models will usually be mathematical in that algebraic symbolism will be used to mirror the internal relationships in the object (often an organization) being modeled.

There are a number of reasons for using modeling:

- a) The actual exercise of building a model often reveals relationships, which were not apparent to many people.
- b) Having built a model it is usually possible to analyse it mathematically to help suggest courses, which might not otherwise be apparent.
- c) Experimentation is possible with a model whereas it is often not possible or desirable to experiment with the object being modeled. It would clearly be politically difficult, as well as undesirable, to

experiment with unconventional economic measures in a country if there was a high probability of disastrous failure. The pursuit of such courageous experiments would be more (though not perhaps totally) acceptable on a mathematical model.

The essential feature of a mathematical model in operational research is that it involves a set of mathematical relationships (such as equations, inequalities, logical dependencies, etc.), which correspond to some more down-to-earth relationships in the real world (such as technological relationships, physical laws, marketing constraints, etc.).

2.The Dynamic of Maritime Education

Under the 1995 Amendments to the STCW Convention, all candidates for certification as deck or engineering officers are required to complete what is described as "approved education and training" and meet the standard of competence specified in the relevant section of the part A of the STCW Code.

The maritime education can be defined as a set of interdependent processes such as teaching, learning, researching and resources including human, material and information that function harmoniously to achieve specified educational objectives. This content can be analysed in four categories: knowledge, know-how, wisdom and the character (Bloom, 1996).

Knowledge enables the people to understand what they learn in relation to what they already know. Knowledge is both practical and theoretical. Know-how differs significantly from knowledge and enables people to put knowledge to work. Wisdom is the ability to distinguish what is important from what is not. Wisdom enables people to set priorities on how to use resources of time, energy and emotion. Character is a combination of knowledge, know-how and wisdom coupled with motivation. It is up each educational organization to identify what to include in each of these four categories. It appears that in maritime higher education, attention is given only to the first of the four categories, with the last two not even given lip service.

In maritime higher education, the lecturers often believe that at the university level their sole duty is to develop knowledge and pass it on to the next generation. The development of the students' character is none of their business. The list of knowledge that the students are expected to acquire is usually a composite of what is required for accreditation and what the faculty decides itself. In general, the accrediting authorities have to pay attention to either wisdom or character in accordance with the goal of the maritime education.

The educators involved in the development of modern curricula in maritime education tend to characterize the curriculum as the complementary relationship of a syllabus and its related teaching and learning processes (Chandler, 1992). Moreover, they have recognized that the teaching/learning process is a highly dynamic one.

We must point out that the curriculum process in maritime education is extremely complex and particular, with many components and interactions. It demands the involvement in naval course programme and syllabus development of those who possess an intimate knowledge of both maritime and educational processes. It is essential that curricula comply not only actual and future maritime sector needs, but also possible changes on labour market regarding job requirements.

2.1 Analysis of Actual Maritime Education System

To achieve a better standard of maritime education, some important measures have to be undertaken to ensure that more modern curricula are developed. Using modeling, we can improve maritime education. The method appears to be extremely efficient in planning a modern curriculum and, even more importantly, its chain structure provides an opportunity for further system development. It allows for the restructuring and modernization of existing study systems without undesirable disturbances and heavy expenditures.

To build a new model in maritime education, firstly we have to analyze the actual educational system in order to identify all disfunctionalities and also the components to be improved. This way, according to Pudlowski (1995), we can see the maritime education system as a chart. Therefore, we must investigate every link because, as a dynamic process, it's better to do changes priority into the main cells. In consequence, the following actions must be undertaken:

- definition of goals
- description of knowledge, skills and attitudes to be developed during the study
- recognition of students' demands from, and expectations of, the subjects taught in the curriculum
- investigation of the interaction between the structured subjects and those based upon it
- examination of teaching methods and their effectiveness
- evaluation of the subject's content
- observation of the teaching process within the subjects
- examination of teaching aids and their usefulness
- analysis of current teaching results.

These actions are essential in evaluating the study system under investigation and may be extremely valuable and helpful in the modeling of a new education structure.

A team including both educational and professional specialists may better carry out the analysis of the actual system. It is known the difficulty to compatibility these two directions for an objective point of view.

Also we consider to be very important that both teachers and students are costumed with a double perspective: investigated and investigator.

2.2 The Need of a New System

A new maritime education system has to be adapted to the reality of the 21st century. Its final goal must be a relational one, according to play an important role as an information processor and distributor on maritime market.

The development of a new educational system is based on the dynamic of the actual maritime world. The main influence factors could be:

- a) Society's demands
- b) Social changes
- c) New tendencies in the world

For more details we recommend the paper by Fukuoka (2000).

3. Future in Maritime Education

3.1. How to Build a New Model

As we have already mentioned, there are two possible situations in developing a new system. The first involves the development of a completely new system, which cannot be related to any existing system, so the entire process is carried out from scratch. As we have already mentioned below, this is not an adequate solution for education. It may, however, be encountered when developing entirely new specialties, where many envisaged subjects are completely original. Frequently, the development of a new education structure is based upon the examination of the existing system.

We have to take into account the other two important components of the building process, such as educational methods and teaching aids. Therefore, the main steps in modeling maritime education could be:

- a) description of actual curriculum
- b) identification of goals
- c) correlation with general educational models
- d) recognition of job requirements
- e) development of a local curriculum, which individualises maritime education
- f) development of aid curriculum (English language and computer science)
- f) development of initial and continue training, prepare for life – long learning
- g) according between theoretical and practical formation.

Every of the above-mentioned steps could be interpreted as a subsystem with inputs and outputs, but all of them are interdependent processes based on teaching, learning, researching. For this model the process variables are both the human resources (teachers and students) and material / information resources (equipment, computers, others aids). These resources must be harmoniously used to achieve specified educational and/or maritime objectives.

In order to test the efficiency of the model, it's necessary to experiment the practical reproduction of the model. The including activities must be easily controlled, measured and assess. On the other side, a major difficulty regarding experimental results is determining of control groups and experimental groups, taking into account the great importance of maritime work.

3.2. Globalization vs. Curriculum

The globalization of the world economy and commerce determine economical and political changes and the opening of international markets. These have made it possible to establish closer economic, industrial and business relationships between countries. In this context, maritime economy, however an international sector developed this dimension. International companies currently recruit foreign national able to practice their profession on the international level. Maritime academic institutions must respond to this trend by preparing their graduates for this new role.

Therefore, in designing modern curricula special care should be taken to ensure that essential qualities and knowledge are included in all courses to form a modern professional profile adapting for the international requests. The curricula in maritime education must include:

- Technical knowledge and skills;
- Intellectual skills;
- Excellence in computer proficiency and in the application of computers;

- Attitudes;
- International standard of practice;
- International business practice;
- International cultural background;
- International maritime law background;
- Foreign language proficiency.

The internationalization of maritime education offers the opportunities for academic institutions to break down cross-cultural barriers, thereby promoting international collaboration, trade, goodwill and development.

4. Conclusions

Everyone accept that maritime education modeling is a real difficult process. On the other hand, in the globalization context, the educational changes are absolute necessary.

To improve the maritime education, we may consider the modeling method. This means time and effort and we are not sure about results, but we have to try.

As we have shown above, the modeling method allows creating and developing new educational structures. Also, its chain structure provides also very important feedback information.

Curriculum reflects the educational policy of academic institutions. Therefore, any changes according to a specified model affect both the structure and the content of curricula. But curriculum changes are not enough. New methods, strategies and teaching aids must be consider.

A new educational system also supposes a new educational management, which needs a great effort from academic staff.

Finally, we conclude that an inter-academicals collaboration could promote important potential in maritime education and it could also be useful in creating a new educational system.

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