

## Safety Management and the Modern Teaching Environment

Utureanu Simona

*"Ovidius" University from Constanta, Faculty of Economic Sciences*

[simonautureanu@gmail.com](mailto:simonautureanu@gmail.com)

Dragomir Cristina

*Constanta Maritime University, Faculty of Navigation and Naval Transport*

[cristinadragomir.umc@gmail.com](mailto:cristinadragomir.umc@gmail.com)

Manole Ionuț-Constantin

*"Ion Creangă" State Pedagogical University from Chișinău, Moldova,*

[manole\\_ionut26@yahoo.com](mailto:manole_ionut26@yahoo.com)

### Abstract

*In this paper we aim to create a link between the pedagogical organization, educational topics and the mode that visual graphic design, aided by technological means (educational software), must collaborate to forge an attractive educational learning product for maritime safety management.*

*Maritime safety and security sectors are becoming sensitive faced with the need for the protection of goods and persons against the multiple threats and risks that are coming from the sea. The growth and diversification of maritime activities are leading to an increase and an evolution of threats. This requires the consideration of individual (accidents, navigation, immigration, terrorism, pollution and illicit traffic) and environmental (disasters and natural resources) risks, as suggested by the ISM Convention and Code.*

*Modern pedagogy proposes to organize the learning process in such a way that content and strategy issues are achieved according to the above learning objectives. The didactic tools interpose between teacher and student, enhancing the instructive-educative capacity of the educator and facilitating the student's learning activity.*

**Key words:** navigation, educational environment, maritime safety, design teacher, ISM

**J.E.L. Classification:** J24, J28, L91

### 1. Introduction

The objectives of maritime safety management are to ensure safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment and property. By properly understanding, learning and enabling safety management objectives, seafarers "should provide safe practices in ship operation and a safe working environment." (Nistor, 2009, p.397). The use of effective, eye-appealing and modern informational techniques during the educational process, might lead to highly satisfactory results.

Safety is the state of being "safe" and protected against all types or consequences of failure, damage, error, accidents, harm or any other event which could be considered non-desirable. International Maritime Organisation (IMO) – the United Nations specialised agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships – places considerations of the human element at the centre of its work. Issues of concern to seafarers such as stress, fatigue, workloads, training standards, safety, security and environmental protection are affecting the competitiveness of a maritime company. Ship owners admit the benefits from employing seafarers who are properly qualified and who have received performant, modern, education and training in order to be able to display the professional standards and technical competence needed to manage today's ships safely and efficiently. That is why seafarers can obtain

seafaring certificates only after they learn properly and demonstrate their knowledge on IMO's International Conventions on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), Safety of Life at Sea (SOLAS) or International Safety Management (ISM) Code. The managers of the shipping companies take over all duties and responsibilities imposed by IMO's ISM Code. They should develop, implement and maintain a safety management system which includes safety and environmental protection policy; instructions and procedures to ensure safe operation of ships and protection of the environment; defined levels of authority and lines of communication between, and amongst, shore and shipboard personnel; procedures for reporting accidents and non-conformities with the provisions of ISM Code; procedures to prepare for and respond to emergency situations and procedures for internal audits and management reviews. (Nistor et al., 2009, p.396-400).

In this paper we make the connection with the computer contribution in the process of creating modern educational tools for enhanced dissemination of the concepts: safety management and maritime safety. This will enable students to acquire knowledge and skills which allows them to adapt to the requirements of a knowledge society which is constantly transforming.

We speak about the design of visual graphic organization in an educational environment, and make some advices for visual design in the context of aesthetic value. We state that all multimedia resources used must be of good quality: both image resolution and sound quality will follow the standards used on the web and in web applications. The visual aspect has a significant contribution to a clear understanding of each information provided, being in accordance with psycho-pedagogical norms and considering students' particularities.

At the end of the paper we make some suggestions on how to integrate the educational means into the whole of modern teaching technologies We underline that any appeal to modern educational means must be balanced by the advantages and disadvantages.

We observe, as a conclusion, that in the maritime management domain the presence of the computer and its efficient use in organizing the training act within the educational process, will facilitate the transmission of the lesson progress made by science and technology.

## 2. Design of visual graphic organization

Good quality education is a prerequisite for ensuring a ship maintains high standards of operation within a safety environment. From the legally imposed training certificates of competence to the cadet programs of practice at the board of the ship, it is essential to understand the strategic importance of operating a vessel to the highest levels. In this paper we will try to answer how the modern teaching environment can have an useful insight in this aspect.

The didactic interaction between the program and the user /student is achieved through a graphical interface made according to a didactic strategy related to the objectives pursued. Allowing the correct interpretation of user reactions (Manole, 2015, p.37) and the adjustment of the process according to a established strategy.

To ensure quantitative and qualitative workloads on safety management (Năftănăilă, 2009, 27), educational software must have high interactivity levels, at least 50% of applications will be interactive. Navigation interactivity is not considered to be pedagogical interactivity.

The information is organized by positioning the text against the image, setting the weight of the text against the image and sound, avoiding overlapping adjacent windows, displaying information in text windows, etc.

Graphics must provide standardization and consistency in using a style.

For the consistency of the didactic process, a number of design or accessibility requirements (Oprea *et al*, 2010, p. 38) need to be standardized to ensure predictability and regularity, i.e. to ensure students' comfort on the one hand, and to help them with the learning process:

- font characteristics (size, color, effects)
- ensures the optimal legibility (at a distance of 60-70 cm from the screen)
- standardization of the interface for all objects to create a common learning environment to ensure the student's comfort organizing the information on the screen: positioning the text against the image, avoiding the overlapping of the adjacent windows, etc.

- use of colors - according to medical and psychological recommendations compliance with standard procedures for all educational software provision of a local help system.
- instructions are standardized, clear, simple, they can be understood by students with low computer skills, are briefly written in an unambiguous form.

### 3. Aesthetic value – advices for visual design

In order to be appealing to maritime students of all ages and backgrounds, graphics used within educational tools must follow some principles (Oprea *et al.*, 2010, p. 71) of web design:

- the principle of unity - all parts of a screen must form a whole;
- the principle of variety - the appearance must be varied and contrasting to defeat monotony;
- the principle of balance - balance is essential between the illustration, text, title and other multimedia resources present on the screen;
- the principle of rhythm - we can get the feeling of movement, even in the case of a static display; A simple mean is the identity of the paragraphs, the view being taken from one paragraph to the next;
- the principle of harmony - the screen must not contain troublesome or sudden contrast elements;
- the proportion principle - refers in particular to the letter body used for different widths of the text;
- color principle - can be used in graphic design, taking into account the physiological and psychological effects of colors and the sensations they create;
- the principle of accentuation - according to which, if everything is accentuated, nothing stands out; Contrast is nevertheless necessary, taking into account the other rules;

All multimedia resources used must be of good quality: both image resolution and sound quality will follow the standards used on the web and in web applications.

The visual aspect has a significant contribution to a clear understanding of each information provided, being in accordance with psycho-pedagogical norms and considering students' particularities.

- simplicity - Software authors tend to include too many details. It is advisable for a page to contain the main ideas and "for more information ..." access links. some research that compared the "dense" text and those containing only the main ideas (by removing 40% of the premiums) concluded that the level of information retention remains the same, while the duration of a work / learning session shortens significantly in the case of "processed" texts.
- positioning in order of importance - The information can be positioned on the page in order of importance and relevance, the privileged place being left, up (for individuals in European, American cultures - who are accustomed to visually viewing the Z-shaped material).
- grouping elements by significance - This principle includes some suggestions for the "topography" of the page. Elements embedded in the same idea must be demarcated by other elements or groups of elements by using free spaces, frame boxes, different colors, and other grouping-labeling methods.
- spacing - it is advisable that the actual text occupies between 25 and 50% of the total space of the page. Highlighting text units by using attributes: underlined, bold or bold. A different color highlights some important information. The spacing between the lines will take into account the size of the body.
- balance and symmetry - The text should be distributed balanced on the page and weighted by including graphics and images. The avalanche of gross, visually unprofessional information is contraindicated, leading to disorientation of users.
- proper use of colors - The finding that the use of a varied chromatic field increases the efficiency of intellectual activity has propelled and diversified research into the influence of colors on the human psyche. An adequate color combination is an important element of the presentation materials. Colors can be used at text, illustrations, and background. The use of color is primarily functional, but largely determines the aesthetics (character and keeping of materials) and, implicitly, the integrity of all software.

- at the level of the illustrations - using colors increases the significance value. The reader receives, processes and interprets a color illustration much faster and more efficiently than a grayscale image.
- indicative symbols - that visually signal the presence of a certain type of content (menu, useful information, recommended links, warnings, etc.) will better perform the orientation function by constantly using colors and taking into account the conventional meanings (yellow - caution, red - attention, etc.).
- background - The chromatic differentiation of the pages of each section or themes can prove to be very useful in general orientation in the presentation material of the software. But the most important aspect of color use for the fund refers to the color function of influencing behavior by triggering emotional feelings, intentions, and positive attitudes.

#### **4. Educational suggestions: integration of educational means into the whole of modern teaching technologies**

In the following lines we make some suggestions on how to integrate the educational means in the modern teaching technologies for maritime safety:

- inclusion in initial and continuous training for teachers of courses and training modules for their empowerment in the pedagogical (Cristea, 2011, p. 241) and computer science design of educational software;
- creating multidisciplinary teams (computer scientists, teachers of various maritime and non-maritime specialties, school psychologist, support framework, visual arts professor, as well as maritime industry representatives) at each level of the maritime education institution in order to implement specific programs for the design of didactic software (Vasilyeva, 2006, p.31), correlated to the real seafaring environment, while monitoring all teaching and learning activities assisted by computer from school;
- posting on the webpage of the maritime education institution or on the weblog, related links, of proprietary software products, shared in distinct folders by the level of education and subject created by the teachers in the institution;
- linking the classes to internet and motivating teachers to become educational software authors (Petac, 2015, p.44);
- planning meetings of methodological committees in which to analyze software products for maritime safety of their own design and teaching-learning-evaluation activities based on computer-assisted training.

Any appeal to modern educational means (Grainne, 2007, p.24) must be balanced by the advantages and disadvantages:

- advantages: They supplement verbal explanations by providing a visible, intuitive support, providing to students a hard-to-reach reality, challenging and supporting cognitive motivations, strengthening knowledge, and making learning more effective.
- disadvantages: they predispose to a standardization of the perception and interpretation of reality, embrace passive reception, sometimes cause distortions of the phenomena exhibited and contribute to the formation of artificial images about society.
- In conclusion, the selection of the means of education can be done with a lot of competence without over-requests or exaggerations.

#### **5. Conclusions**

In contemporary society a very interesting phenomenon is observed regarding the link between the progress of science and education (Storo, 2013, p.124). This connection is not new, it has manifested itself in all ages and civilizations and consisted in transmitting within the lesson the progress of science and technology. What makes this link interesting nowadays is the presence of the computer and its use in organizing training, conducting education, or teaching pedagogy.

- Computer-assisted training gives the learner the opportunity to learn through research, discovery, interact and respond to various visual or auditory stimuli.

- The computer offers a wide variety of information, questions or problems, presented in audible or visual form, through texts, photographic images, animated videos, drawings or graphics. The computer is an interactive environment that keeps the student's attention and motivation awake, regardless of the degree of difficulty.
- Like any didactic method (Neacșu, 2007, p.639), computer-assisted learning has advantages, which must be known by the teacher to be used or, on the contrary, avoided. First of all, using a computer means a great deal of time, but it is very expensive. Second, the computer stimulates some phenomena and processes, but does not replace experiments or their direct observation.
- The learning process requires a variety of qualities and contributes to their formation and development, as well as other skills and competences that can provide the student with the "keys" for successfully completing the maze of life in a complex society such as the knowledge society.
- Under the slogan: "Do not teach others what you want, you do not teach them what you know, you teach them what you are." (Jaures, 1902, p.21) it can be done any learning activity whatever the proposed form, traditional or computer aided.

Digital resources are an auxiliary support for learning maritime safety. Educational software is a response to a thorny question that concerns most teachers: "how to attract and motivate students to learn about this discipline ?"

Educational software is the flame that can rekindle the student's interest, if well graphically and pedagogically designed, can keep it burning, leading for the first time at least a rapprochement and a "friendship" of the student with the rigor of science.

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