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REVIEWING SPECIFIC FEATURES OF MONITORING MARITIME STUDENTS' LEARNING OUTCOMES

Визначені основні особливості організації моніторингу навчальних досягнень студентів у морських ВНЗ, основні нормативні документи та організації, що регламентують моніторинг навчальних досягнень студентів у морських ВНЗ.

***Ключові слова:** навчальні досягнення студентів морських спеціальностей; Міжнародна морська організація; моніторинг; Міжнародна конвенція з підготовки, дипломування моряків; морська освіта та навчання; оцінювання; компетентність; модельні курси.*

Introduction. Globalization has emerged as one of the most powerful socio-economic and political forces shaping the world today. With the rapid growth of globalization in world maritime trade, standardization of maritime education and training has become more important to achieve better service quality. The impact of globalization on shipping has been most phenomenal. International and regional cooperation and integration has become a policy instrument for attaining accelerating economic development all over the world. The world merchant fleet is improving both in quality and quantity to meet the demands and requirements of the shipping industry.

As a consequence, the level and the extent of automation and human element in the use of automation have also increased for both economic and efficient use of well qualified and competent manpower. It is now clearly understood that to ensure safety at sea, in addition to technical measures, the studies on human element are also deemed necessary. However, the world is still facing shortage of qualified and efficient officers. This shortage of officers is likely to severely affect the future of shipping. The International Maritime Organization (IMO) in cooperation with maritime community has started initiative to overcome the lack of the qualified seafarers' problem. Furthermore, with the application of new and advanced technologies, ship crews are kept to minimum levels. Therefore highly qualified seafarers are required to run these advanced ships. In this context the process of monitoring maritime students' learning outcomes is a key problem of Maritime Education and Training.

Theoretical framework and research methods. The problem of monitoring maritime students' learning outcomes is multifaceted and multifaceted. A number of studies have been conducted to discover the monitoring learning outcomes influences on effectiveness of Maritime Education and Training, its peculiarities regarding maritime specification.

The research done by V. Andreev [1] indicates that monitoring of education quality is effective in terms of high quality learning with a high level of taxonomic knowledge among the students. A study by S. Bauk, T. Dlabač and Ž. Pekić [2] describes monitoring in a positive way as a method in final assessment of competence certification.) I. Boychuk [3] clarifies in his study the importance of quality monitoring of modern specialist's training.

E. Gholamreza, M. Wolff [4] defines main contradictions in the practices of training for seafarers and assessment of professional competency. In the context of our research the thesis of M. Kadioglu [5], who reviews the main specifications of Maritime Education and Training institutions. These studies describe the monitoring of as an effective tool, both in learning and competence evaluation perspectives. However, the problem of monitoring maritime students' learning outcomes in Ukrainian institutions hasn't been discovered.

The aim of the research is to describe the main peculiarities of monitoring maritime students' learning outcomes.

Main part. Nowadays everyone recognize the importance of quality for any institutions. So, the maritime education and training organizations came into situation to recognize the national standards and the special maritime requirements. So the creation and implementation of quality management systems in maritime higher education institutions is provided in accordance with international standards, ISO 9002: 2000 quality standards. However, the training of marine specialists is also guided by the requirements of the International Maritime Organization, such as Standards of Training, Certification and Watchkeeping for Seafarers Convention (STCW) an IMO Model Courses for operational and management levels, which states, that one of the effective ways to reduce the risks associated with human error in the vessel navigation is to implement the highest standards of training, certification and competence of seafarers into the education process. This hierarchy is shown in the figure 1.

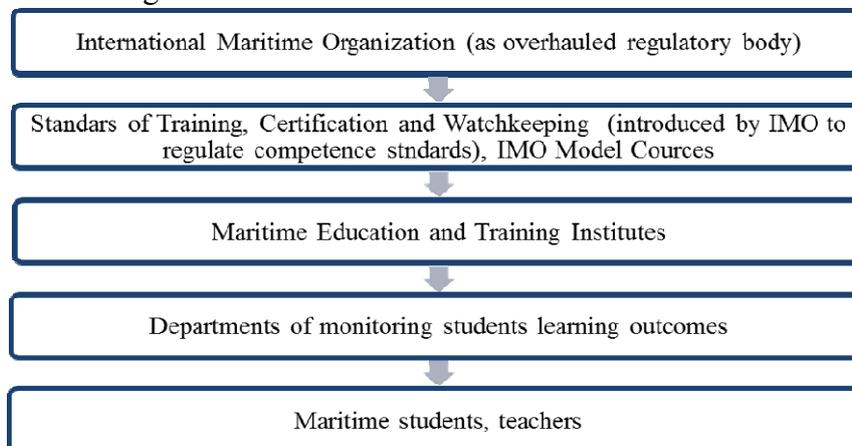


Figure 1. The scheme of monitoring maritime student's learning outcomes

In the context of our research we will describe the elements of the monitoring system more detailed.

The International Maritime Organization (IMO) was established in 1948 as a specialized agency of the United Nations and, in the process, has been charged with the regulation of international shipping from the safety, security and environmental protection points of view. It has 173 Member States, three Associate Member States, some 400 staff and is based in London, United Kingdom. During its existence, IMO has established a comprehensive body of international conventions, supported by hundreds of recommendations governing every facet of the shipping industry. This organization as overhauled regulatory body complies different conventions and codes, model courses.

In the context of our research, the most significant are Model Course 3.12 – Assessment, examination and certification of seafarers. S. Bauk, T. Dlabáč and Ž. Pekić describe it so as participants, upon successful completion of the course, should be able to:

- apply the international provisions concerning the training, assessment, examination and certification of masters, officers and ratings of merchant ships;
- interrogate the provisions of the STCW Convention and Code with a view to optimally implementing these provisions in the national context;
- analyze national assessment, examination and certification needs;
- determine appropriate assessment procedures and methods;
- organize, administer and conduct assessments/examination;
- issue and control certificates [2, p. 253].

The STCW has been revised in 2010, the amendments, to be known as The Manila amendments to the STCW Convention and Code are set to enter into force on 1 January 2012 under the tacit acceptance procedure. It is aimed at bringing the Convention and Code up to date with the developments since they were initially adopted in 1978 and further revised in 1995; and to enable them to address issues that are anticipated to emerge in the foreseeable future.

There are a number of important changes to each chapter of the Convention and Code, as follows:

- improved measures to prevent fraudulent practices associated with certificates of competency and strengthen the evaluation process (monitoring of Parties' compliance with the Convention);
- revised requirements on hours of work and rest and new requirements for the prevention of drug and alcohol abuse, as well as updated standards relating to medical fitness standards for seafarers;
- new certification requirements for able seafarers;
- new requirements relating to training in modern technology such as electronic charts and information systems (ECDIS);
- new requirements for marine environment awareness training and training in leadership and teamwork;
- new training and certification requirements for electro-technical officers;
- updating of competence requirements for personnel serving on board all types of tankers, including new requirements for personnel serving on liquefied gas tankers;
- new requirements for security training, as well as provisions to ensure that seafarers are properly trained to cope if their ship comes under attack by pirates;
- introduction of modern training methodology including distance learning and web-based learning;
- new training guidance for personnel serving on board ships operating in polar waters;
- new training guidance for personnel operating Dynamic Positioning Systems [6].

Seafarers can acquire professional competence in workplace settings on board ships and in METs under academic guidance as the training structure of a seafarer is divided into college and sea-based training. In the seafaring industry, global, minimum competence standards were established through STCW by the IMO. The IMO is the over-arching regulatory body that, together with national maritime regulators, enforces the requirements of STCW on maritime nations (or States) that have ratified the convention.

As E. Gholamreza, M. Wolff noted, countries fully complying with the provisions of STCW and its training and education practices are listed as the 'white list' of nations in the maritime industry. IMO has authorized the national maritime regulators to grant approval to METs for conducting STCW-approved courses if, after a thorough inspection of their facilities, they are found to be in full compliance with the provisions of STCW [4, p. 261].

Figure 1 describes the roles of the key stakeholders in the implementation of STCW. The STCW applies to seafarers who are working or intending to work on commercial vessels on domestic (coastal) or international voyages but not to those serving on naval vessels, Government-owned or operated vessels engaged in non-commercial service, fishing vessels, pleasure yachts not engaged in trade and wooden ships of primitive build.

In his research M. Kadioglu states, that STCW provides guidance to stakeholders about the competence that needs to be developed to safely operate ships, with an aim to create consistent and uniform competence standards in a global industry. STCW has been revised twice (1995 and 2010) since it was concluded in 1978. Currently, the revised STCW is referred to as STCW'95 including 2010 Manila Amendments [5, p. 111].

The references made by STCW Convention to quality standards are related to quality assurance: all training; assessment of competence; certification; endorsement; revalidation activities. All the above have to be continuously monitored through a quality standards system to ensure the achievement of defined objectives, including those concerning the qualifications and experience of instructors and assessors. In keeping with the requirements of IMO – STCW and Vocational Standards applied by maritime nations for higher qualifications, Kherson State Maritime Academy as an example of Maritime Education and Training Institute employs Quality Management processes and procedures. Quality Standards developed by International Professional Institutions are included for both the students and teachers.

Kherson State Maritime Academy (KMA) promotes itself as a leading maritime education institution in Kherson, with well-educated teachers possessing extensive practical experience as marine officers. Although traditional teaching methods such as lectures, group assignments and ordinary theoretical exercises still form a large part of the education, there is now a greater part that is related to simulators than previously, which demonstrates the harmonization with the new requirements of STCW. This is now done to provide the students not only with theoretical considerations but also to provide them with a better knowledge, understanding and skills in problem-based learning situations. It should be noted that monitoring process in KSMA has some peculiarities of its organization. Students have to demonstrate competence by compulsory tests in different forms, both written tests and simulator tests, throughout the year. If they pass the tests they will be permitted to sit the final exam. The final exam form consists only of a one-hour and twenty minutes computerized test where the students have to demonstrate their total competence in the function. A passed or failed exam result determines if the students are ready to start their seagoing career, and finally are allowed to be issued with certificates. The reason for using this exam form may be related to economic reasons, logistics, availability of simulators during the exam period, or simply that the teachers' opinion are related to a computerized exam form as the best solution to demonstrate competence.

The requirements for organization of monitoring students' learning outcomes are found in STCW minimum standards of competence for assessment. (See the extract in Table 1.)

Table 1

STCW minimum standards of competence for assessment (extract)

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Carriage of dangerous goods	International regulations, standards, codes and recommendations on the carriage of dangerous cargoes, including the International Maritime Dangerous Goods (IMDG) Code and the International Maritime Solid Bulk Cargoes (IMSBC) Code Carriage of dangerous, hazardous and harmful cargoes; precautions during loading and unloading and care during the voyage	Examination and assessment of evidence obtained from one or more of the following: 1. Approved in-service experience 2. Approved simulator training, where appropriate 3. Approved specialist	1. Planned distribution of cargo is based on reliable information and is in accordance with established guidelines and legislative requirements 2. Information on dangers, hazards and special requirements is recorded in a format suitable for easy reference in the event of an incident
Respond to a distress signal at sea	Search and Rescue Knowledge of the contents of the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual	Examination and assessment of evidence obtained from practical instruction or approved simulator training, where appropriate	1. The distress or emergency signal is immediately recognized 2. Contingency plans and instructions in standing orders are implemented and complied with convention

The extract shows that competence for carrying out an effective search and rescue at the operational level can be assessed without identifying and testing for essential underpinning skills, such as: the ability to report information without distortion or filtering; the ability to prioritize according to urgency of the situation, and so on. Competencies are skills distinct from technical and work-related skills which, when used singularly or in various combinations integrally with the technical skills, support the performance that defines competence. Investigations into shipping accidents have often indicated seafarers lacking such skills. The assessments designed should ensure that such underlying competencies are identified and suitably assessed in a unit of competence to develop the skills in the seafarers. The extract above also highlights that STCW encourages assessment for individual competence units and not a holistic approach to assessment. Students should be able to integrate the competence gained from individual units in STCW into a successful performance reflecting workplace standards. Using the example from Table 1, the competence to respond to distress signals at sea should be simultaneously assessed with the ability to carry out routine duties of navigation and vessel passage monitoring, as may be required at the workplace.

Conclusion. Monitoring maritime students' learning outcomes is a significant component of education along with learning and teaching. It can be conducted at various stages of the learning cycle with its outcomes providing feedback about: a student's progress and achievements; the effectiveness of the teaching and instruction methods; and the course outcomes while fulfilling the overall goal of improving student learning. In the context of professional education and training, such as seafaring, monitoring also provides feedback about the achievement of professional standards by students that are essential for the workplace. Attainment of such standards provides evidence of an ability to combine knowledge, skills, values and attitudes into behaviour required to perform in the real world which defines the maritime student's professional competence.

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Abstract. *Introduction. Maritime education is one of the key factors for the stable development of the state. The fundamental task of Maritime Education and Training institutes is effective seafarer's education in a way that they acquire applicable knowledge, skills and competencies. Such results cannot be done without monitoring of students' learning outcomes. Comparing to other institutions maritime education and training institutions have special peculiarities of monitoring students' learning outcomes which should be review for better understanding of this process.*

Purpose. The aim of the thesis is to describe the main peculiarities of monitoring maritime students' learning outcomes.

Results. The creation and implementation of quality management systems in maritime higher education institutions is provided in accordance with international standards, ISO 9002: 2000 quality standards. However, the training of marine specialists is also guided by the requirements of the International Maritime Organization, such as Standards of Training, Certification and Watchkeeping for Seafarers Convention (STCW) and IMO Model Courses for operational and management levels, which states, that one of the effective ways to reduce the risks associated with human error in the vessel navigation is to implement the highest standards of training, certification and competence of seafarers into the education process. The references made by STCW Convention to quality standards are related to quality assurance: all training; assessment of competence; certification; endorsement; revalidation activities. All the above have to be continuously monitored through a quality standards system to ensure the achievement of defined objectives, including those concerning the qualifications and experience of instructors and assessors. In keeping with the requirements of IMO – STCW and, Vocational Standards applied by maritime nations for higher qualifications, Kherson State Maritime Academy as an example of Maritime Education and Training Institute employs Quality Management processes and procedures. Quality Standards developed by International Professional Institutions are included for both the students and teachers.

Originality. Author analyzes the main peculiarities of monitoring of maritime students' learning outcomes.

Conclusion. Monitoring of students' learning outcomes will allow finding optimal ways of training highly skilled and competitive specialists in the maritime sphere in accordance with requirements of maritime documents and techniques required for the modern on board ship management, but also to be prepared for the development of global shipping as a whole.

Key words: maritime students' learning outcomes; IMO; monitoring; STCW; Maritime Education and Training, assessment; competence; Model Courses.

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