FORMATION OF PROFESSIONAL COMPETENCES OF FUTURE MARITIME PROFESSIONALS IN THE CONDITIONS OF INFORMATION AND TECHNOLOGICAL ENVIRONMENT

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Abstract. The article discusses the experience of usage of the immersion method while the training of students of maritime specialties by the use of various training simulators. The immersion method allows training in conditions that are close to the real conditions of future professional activity. Therefore, its use in the training of future maritime professionals is well founded. After all, their professional competences must be formed at a high level and well-developed professional skills, which can be achieved only in the process of training close to the conditions of activity in the field of marine industry. Nowadays use of simulators in the training of future maritime professionals was described. The modeling the real situations of future professional activities of maritime professionals in the educational process is of particular importance. Such training is possible through the use of special simulators with appropriate software that greatly expand the training area, including the development of those professional skills that are related to the management of the ship, in particular and in difficult conditions, providing for troubleshooting, crashes, corrections mistakes and their prevention. The need to use simulators is also due to the fact that emergencies occur relatively infrequently, and therefore appropriate skills and competences are not automated in daily professional practice. As the conclusion it was summed up that during the implementation of the developed model of distance learning technologies application in the professional training of KSMA (Kherson State Maritime Academy) cadets, the educational potential of the educational institution was revealed. It has been found that interactive information and communication tools of the

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Internet provide flexibility in the use of time and place of training of cadets and the reality of unlimited educational discourse. In practice, KSMA has proven that it is best to use a combination of synchronous («face-to-face») and asynchronous (Internet) training for the purpose of optimizing the training of future maritime specialists.

1. Introduction

Transition to the information society, expansion of human activities leads to the search for innovative forms of educational process organization. Modern river and sea transport is constantly being upgraded with new vessels incorporating state-of-the-art technology, so the requirements for training maritime professionals are constantly increasing. Traditional pedagogical technologies do not always meet the needs of training and lose their relevance. In this regard, current trends in the development of professional maritime education require individualization of the educational process, which is why the development of pedagogical adaptive learning technologies. They ensure the achievement of the optimum level of intellectual development and formation of professional skills in accordance with the natural tendencies and abilities of the individum, as well as create conditions for differentiated learning depending on the level of training and needs of students, the development of their independence and motivation in the educational process, contribute to the successful overcoming of gaps in training of specialists, through the implementation of automated control of knowledge and opportunities to form a student's individual educational trajectory.

Requirements for a modern system of training maritime professionals in higher education institutions requires the search for qualitatively new innovative teaching methods that will ensure mastery of professional competences, taking into account the practical activities of maritime professionals.

Modern maritime education is a complex system. So getting a diploma from an educational institution does not entitle you to work in a position on a ship. Before that student has to undergo additional training programs and has an appropriate shipboard qualification. For example, to obtain the first working diploma of a Master, you must have a shipboard license of one year. From which six months of watch must be on navigation bridge.

Given the continued implementation of the latest technologies in the world maritime industry and shipping, crewing companies place more stringent demands on the cadet, a future maritime specialist.

In a digital society characterized by the intensification of social processes and the increase in the geometric progression of human knowledge, traditional teaching methods do not contribute to the natural process of satisfying the thirst for cognition and effective training for future professional activity.

The International Maritime Organization (IMO) has declared the requirements for all applicants for positions on the fleet and written them in competences with a clear list of knowledge and skills, as well as methods of assessing the acquired competencies. Therefore, the formation of the competencies of future maritime specialists is one of the main tasks of modern training in educational institutions.

Compensation formation can occur in different methods. One of them is the immersion method.

2. Analysis of recent research and publications

In most theoretical and methodical scientific papers the method of immersion (immersion method) is considered in the process of learning foreign languages (V.A. Timofeev, A.D. Vyselko, A.A. Shakirova, R.A. Valeeva, A.Yu. Yurzhenko and others). As one of the methods of professional education, the method of «immersion» was considered by E.K. Hitman [1]. The study of the process of immersion in the object of cognition as a condition for the formation of cognitive and creative independence of students in heuristic learning was made by S.V. Mikhno [2]. V. Shavrovska considered the method of «immersion» as a modern model of teaching and education in different age groups [3].

The impetus for the study of the method of «immersion» in learning was the scientific study of M. Shchetinin. The initial position of the method of M. Shchetinin was the idea of a holistic perception and understanding of the student of the entire year course in the short term. Organizationally, this is achieved, firstly, by concentrated study of one subject in the shortest possible time and, secondly, by repeated four times during the academic year of such immersion, at a higher level – from orientation to creative [4, p. 632].

In modern pedagogical theory and practice, the method of «immersion» has become known as concentrated learning, which, depending on the number of disciplines studied at the same time, is proposed to group into three groups and accordingly to consider three models of organization of concentrated learning: concentric immersion – learning alone (from a few days to a few weeks); linear immersion – study of one material during the year (or the whole course of study); concurrent study of three to four disciplines forming a peculiar module [5, p. 1330-1331]. Granovska R.M. notes that in the immersion method, the focus is shifted to the further application of knowledge, and the main task for learners is understanding that automatically involves involuntary memorization. The direct purpose of learning is to encourage a «life» in a particular situation, to understand the nature of interaction in it [6, p. 577-578].

Notwithstanding that there are studies in the domestic and foreign scientific publications on the use of the method of immersion in education (A.V. Khutorskoy, M. Shchetinin, etc.), in particular professional (A.D. Vyselko, E.K. Hitman, S.M. Ovcharov, N.A. Sushkova, etc.), the rationale and description of this method in the professional training of maritime specialists have not been sufficiently investigated.

The «immersion» method allows training in conditions that are close to the real conditions of future professional activity. Therefore, its use in the training of future maritime professionals is well founded. After all, their professional competences must be formed at a high level and well-developed professional skills, which can be achieved only in the process of training close to the conditions of activity in the field of marine industry. The use of the immersion method in the training of future maritime professionals is facilitated by the use of various training simulators.

In recent decades, pedagogical science has received considerable development of research in the methodology of formation of professional competencies of specialists in various fields (I.B. Zarubinskaya, V.A. Petruk, L.E. Petukhov, O.M. Spirin, V.V. Yagupov and others), in particular in the field of sea and river transport (O.V. Gurenkova, O.O. Dendrenko, S.V. Kozak, I.V. Sokol, V.V. Chernyavsky and others). However, not all of the methods proposed by scientists find application in the training of future specialists in river and sea transport, which can be explained by their general scientific nature. The practice-oriented component remains

insufficiently developed for practical implementation in the educational process of a maritime educational institution.

In the practice of training specialists in river and sea transport, the tasks of water, fire, removal of the vessel from shallow water and other emergencies or crisis situations are solved. For this purpose, various simulators are used, in which the students' training is reduced to performing some routine operations (to train for evacuation, to extinguish a fire, etc.). However, such important tasks as the prediction of an emergency situation and its consequences are not solved, that is, the system of causation is not considered. It should be noted that these tasks can be solved by using the gamification method.

The method of gamification was studied by A. Yurzhenko, who in her writings used this method to form the English-speaking communicative competence of future ship engineers. Elements of gamification include: maps, leaderboards, gamified exercises, missions and levels, progression loops, etc [7].

We consider also one more effective method, the scenario method, as a system-building construct and a means of developing competencies in the field of navigation safety and fishing. In particular, the development of analysis skills, prediction of possible areas of emergency development and possible outcomes, the development of proactive measures to reduce the likelihood of negative outcomes.

An artificially created emergency in the dynamics of its development is a powerful motivating factor that encourages the cadet / student / specialist to obtain the necessary knowledge. The development of preventive measures and the adoption of operational decisions to ensure safety / stop the development of an emergency allows you to acquire the necessary skills. So, when considering hydrometeorological conditions as a prerequisite for the appearance of a source of emergency situation, it becomes obvious the need to predict the occurrence of storms, hurricanes, tsunamis, etc. The quality of forecasts depends on the monitoring of natural and atmospheric phenomena, therefore, the organization of monitoring and forecasting are important tasks in the context of risk assessment and management.

To determine the following priority tasks that need to be addressed in the risk management process: organization of monitoring, including the formation of arrays of statistical data in areas covering accident issues, natural and technological factors, the human factor (errors and their causes);

development of methodological approaches to the analysis of information related to the safety of navigation, natural phenomena, statistical data, etc.; forecasting the dynamics of future conditions, conditions for the occurrence and development of emergencies, consequences of accidents; development of methods and models for risk assessment etc.

3. The use of simulators in the training of future marine professionals

In the marine industry, it is important to effectively navigate a ship, which is influenced by both external and internal destabilizing factors. Internal factors include the human factor, which impact on security is very large. Therefore, modeling the real situations of future professional activities of maritime professionals in the educational process is of particular importance. Such training is possible through the use of special simulators with appropriate software that greatly expand the training area, including the development of those professional skills that are related to the management of the ship, in particular and in difficult conditions, providing for troubleshooting, crashes, corrections mistakes and their prevention. The need to use simulators is also due to the fact that emergencies occur relatively infrequently, and therefore appropriate skills and competences are not automated in daily professional practice.

One of the basic conditions of professional development is training. The rapid development of computer and information technology in the late XX – early XXI centuries promoted the growth of specialized training centers that provide practical training for the sea staff. Possibility of adequate modeling of navigation and meteorological conditions, emergencies, working out of the interaction of the crew of the vessel with the coast services, other vessels expanded the use of maritime simulators both within the educational standards in the training of specialists in educational establishments and in the system of professional retraining. Moreover, the International Maritime Organization (IMO) defined the training and introduced it into the International Convention and the relevant Code for the Training and Certification of Watchkeeping for Seafarers (STCW-78) [8]. The amendments made by the IMO to the Convention in 1995 defined the operational requirements for a number of simulators and introduced, for the first time in international normative practice, the training and assessment of competencies using

simulators to maintain the professionalism required by Part A of STCW Code. Features of this complex use in the training of future seafarers were studied by V.V Kuzmenko, I.M Ryabukha [9], the dynamics of psychophysiological functions in cadets and navigators in solving the problems of navigation on a radar simulator – by A.S. Maltsev and V.V. Golikov [10].

In the marine industry, there is a growing demand for seafarers' readiness to perform productive tasks in extreme conditions. This encourages the development and implementation of the watch cadets on a qualitatively new basis for the use of practical and training facilities. In this regard, the KSMA – Virtual Reality Vessel project was implemented into Kherson State Maritime Academy (KSMA) educational process. The current KSMA base in terms of volume and content corresponds to all components of a virtual-real training and production vessel.

The training complex «Virtual-real ship of the maritime industry» includes 19 laboratories, 16 simulators and 21 training rooms, in particular:

1. a complex navigation bridge simulator that includes electronic mapping and navigation systems, a radar pad class and a full-featured navigation bridge;
2. complex engine room simulator, which includes two engine rooms, control center and theoretical training class;
3. complex dynamic positioning simulator, consisting of a fully functional navigation bridge of dynamic positioning of a ship, a class of theoretical training and a class with separate stations of dynamic positioning;
4. GM Global Maritime Distress Safety System (GMDSS), which consists of two separate practical training classes;
5. training complex for working out water safety and fire fighting skills; laboratory of cargo operations;
6. fire station;
7. mooring station;
8. laboratory of marine power plants;
9. onboard medical aid laboratory;
10. laboratory of high-voltage equipment;
11. laboratory of electrical engineering and automated electric drive;
12. information technology laboratory;
13. water-training station;
14. laboratory of group lifeboats on board the vessel.

In order to implement training, the concept of its integration into the curriculum was implemented. For this purpose, integrated plans for conducting training courses were developed for the students to receive all the certificates required to complete the internship and obtain the first working diploma.

Training with the help of simulators in KSMA and MC KSMA is divided into two stages. The first stage is the training of cadets – shipboard practice. The cadets receive certificates of international standard, in accordance with the requirements of the Convention STCW, as amended [6], by studying the relevant courses, namely:

1. «Safety briefing, initial training and debriefing».

2. «Training of specialists in lifeboats, life rafts and rescue boats, which are not high-speed regular boats».

3. «Fulfillment of the duties of crew members for the security of the ship».

4. «Training and instruction on safety for all seafarers».

The second stage is the preparation of the documents for the students to receive their first working diploma. Students are trained to receive certificates in the following courses:

5. «Fire fighting training under the extended program».

6. "First Aid Training".

7. "Navigation training using radar, ARPA, teamwork on bridge, search and rescue at operational level" (for navigators only).

8. «Training on the use of electronic mapping and navigation information systems at the operational level» (for navigators only).

9. «Course of training or updating of knowledge on the ARPA simulator according to the training program according to the diploma of the general operator of GMDSS» (for navigators only).

The course «Introduction, Initial Training and Security Training» is integrated into the course «Life Safety at Sea». Its teaching is carried out not only by an experienced teacher, but also by a qualified instructor of the training center. The immersion method is implemented in the transition from lectures to the development of skills to comply with safety rules on board a ship. Classes are held in the training laboratories of KSMA: «Training complex for working out skills on safety», «Fire ground», laboratories «Medical assistance on board» and lab «Fire Fighting».

The training laboratory «Training complex on working out the skills of safety on the water» contains a water pool for working out skills of rescue on the water and rescue from a helicopter cabin, a lifeboat of a closed type. This lab allows students to acquire hands-on skills in personal marine survival, first aid, personal safety and community responsibilities. The laboratory includes a training class equipped with multimedia tools for presentations during training sessions, and simulators for practicing emergency helicopter abandonment using breathing apparatus, helicopter seat belts, helicopter and rafts under water through emergency exits (doors and windows).

The training ground for the Firefighter training consists of two containers (40-foot and 20-foot) that have been converted for training in firefighting. Containers are equipped with a sprinkler extinguishing system that allows you to simulate a fire in the engine room, in a living room, to conduct evacuation training from a smoky room. The simulator allows the training of fire fighting skills on the ship, the organization and training of fire parties, inspection of equipment and systems for detecting and extinguishing a fire, investigating and reporting fire incidents. It also enables practical and theoretical training of cadets with the further development of the following competencies: management of fire fighting operations on ships; organization and training of fire teams; inspection and maintenance of systems and equipment for fire detection and fire fighting; investigating and reporting fires related to incidents.

The course «Training of Lifeboat, Duty Non-Speed Boats Specialists» is integrated with the course «Comprehensive Training in Practice and Diploma Certification». The course is conducted in the training laboratory «Training complex for working out the skills of safety on the water», simulators «Free Fall Boat» and «Speed Lifeboat». This enables future marine professionals to gain hands-on immersion skills at sea, first aid, personal safety, and public duties, using the immersion method; for training and landing of people in high-speed lifeboats, safe launching and lifting of the boat on board, operation and control of the speedboat motor.

The course «Training and Instruction for the Safety of All Seafarers» and «Performing Duties of the Crew on Ship Security» is integrated with the course «Ship Security Measures» and is conducted at the Ship Security

Training Laboratory. This lab is equipped with multimedia facilities if it is possible to work out the actions of the team in case of threat to the safety of the ship. Students can use a projector and computer equipment to help simulate a particular situation aboard a ship. The cabinet contains a set of demonstration posters, which give cadets the opportunity to get acquainted with the means and methods of ship's security, possible actions of the team in case of pirates' attack, to master the plan of security of the ship.

With the courses «Comprehensive training in practice and diploma certification» and «Simalators' training» integrated course «Training in fire fighting in the advanced program». It is conducted in the training of laboratory-simulator «Fire ground». The simulator enables future maritime professionals to develop fire fighting skills on board, organize and train fire parties, inspect equipment and systems for detecting and extinguishing fire, investigating and reporting fire incidents.

The course «First Aid Training» integrates with the courses «Comprehensive Training for Practice and Diploma Certification» and «Simulators' Training», which facilitates the transition from theoretical material to the consideration of specific situations and analysis of crew behavior during emergencies. This course is delivered at the Medical Aid Ship Training Laboratory, which is equipped with multimedia tools to help students improve their health-saving skills. To train the cadets for first aid on board the vessel, the laboratory has a complete set of equipment, namely: dummy – imitation of a human figure; dummies for practicing subcutaneous and intramuscular drug administration skills; simulators of wounds and injuries; medical cabinet in which there are models of modern disinfectant solutions of domestic and foreign production; medicines commonly used in marine medicine, and ampoules of medicinal solutions, etc.

The course «Navigation training using radar and ARPA to teamwork on the navigation bridge, search and rescue at management level» is integrated into the course «Using radar and automatic radar in the ships». To implement the immersion method in order to improve the professional training of future maritime specialists training is carried out in the laboratory «Electronic navigation», which is used to train the foundations of the theoretical course of traditional methods of navigation, as well as for basic training and practical training with modern automated means of navigation. In the laboratory the place of the teacher is equipped with controls for

workplaces of students, sound system, projector and performs the function of a «virtual» navigational bridge of a controlled vessel with connection to it stations ECDIS (Electronic Chart Display and Information System) and ARPA. The laboratory confirms the requirements for class C2 DNV / IMO classrooms.

The course «Navigation Information Systems» integrates the course «Training for the use of electronic mapping and navigation information systems at the operational level». This course is taught in the training laboratories «Using Automated Radar Seal and Radar Stations» and «Navigation bridge», which allows them to be taught how to maneuver a ship, control towing and mooring operations, and search and rescue operations for specialized types, keeling and observation of the ship's propulsion system, use of the maritime communication system. Immersion in the near-term conditions of future professional activity allows students to gain knowledge, skills and understanding of navigation and electronic charts to fulfill the duties of the duty officer identified in the STCW; be able to work with, interpret and analyze information obtained from the ECDIS.

The course «Training or Upgrading of Knowledge on the GMDSS (Global Maritime Communication System during Disasters and for Navigation Safety) Simulator under the GMDSS Operator General Training Diploma» program is integrated into the training course of future maritime specialists in Global Maritime Search and Rescue. This course is taught in a training laboratory – GMDSS Simulators. The laboratory allows the training of the general GMDSS operator and the operator of the restricted area, as well as the training of search and rescue operations (SAR). The laboratory has 15 GMDSS simulators, as well as a hardware GMDSS stand, which is a full-featured copy of the GMDSS console of the modern vessel.

At the heart of the project is the task to use in full the created complex of training, practical and production base; to develop the necessary software and methodological software for this purpose and to bring into its implementation appropriately trained scientific personnel, professional sailors-specialists of high qualification and representatives of management of the maritime industry.

Involvement of experienced maritime practitioners to participate in the project will allow to simulate the extreme conditions of cadets carrying the watch close to reality, structured in the virtual reality vessel existing in

KSMA. This will allow cadets to master the professional knowledge and communication skills and to further demonstrate them while working on the ships of the international crews during the theoretical classes and practical watch on the virtual training base of the educational institution.

The implementation of the project involves the redevelopment of the educational space of the Academy and its structural subdivisions in accordance with the level of professional training of seafarers in the information and technological educational environment. Planning should take into account the required amount of professional competencies that cadets must master during their training for shipboard practice and before employment.

Depending on the level and specialty of training, weeks of hands-on cadet watch should be planned as part of full-fledged shipboard teams.

The watches will be scheduled weekly and divided into 2 periods:

– week of practical work in the conditions of watch;

– week of discussing and analyzing the quality of watchkeeping.

Watchmaking and content planning for watchkeeping tasks will be organized by teachers of professional disciplines, instructors of the Kherson Maritime Specialized Training Center (KMSTC), maritime specialists, teachers of the academy, and representatives of cluster participating companies. The cadets must personally complete a weekly training watch on a separate plan and schedule during the first week. During the second week the cadets will act as observers during the demonstration final watch. This week is a period of discussion and analysis. The watches are designed in such a way that every cadet will be able to undergo training and certification on the basis of the KMSTC prior to heading for shipboard practice. This training will take place according to a timetable incorporated into the training net. Training watches will be conducted using the offices, laboratories and training facilities of the KSMA. The project envisages the creation of a unified communication system.

It is planned to create 3 centers of management of the «virtual reality ship»:

1. Deck Command Center (Captain's Navigation Bridge).

2. Engineering Command Center Center (CPU controlled by a senior mechanic).

3. Master-mentor and mechanic-mentor center.

The team captain will comment on the overall course of the watch.

An example of one-day navigation training programs is following:

1st Day:

On the simulator, the cadets study navigation areas: the English Channel, the New York Port with passageways, the Singapore Strait, the Bosphorus Strait and the Port of Istanbul, the Hong Kong Port with the aisles, the Gulf of Mexico and the Gulf of Guinea.

They choose different types of vessels: bulkers, container vessels, tankers, motor vehicles, river-sea, offshore vessels.

Further, the competence checking is performed by SEAGULL Computer Based Training Tests: 0049 – Radar Observation and Plotting, 0066 – Basic Ship Handling, 0103 – Integrated Navigation System, 0211 – ECDIS System and Chart Types, 0213 – Passage Planning with ECDIS, 0215 – Voyage Planning – pre-departure, 0217 – Voyage Planning – Pilotage and Berthing.

The implementation of the project allowed to create the information and technological educational space of the Academy for the training of maritime specialists through the tight integration of theoretical, practical and simulators training implemented in blended learning with the application of LMS MOODLE in accordance with the requirements of STCW 78/95 with the Manila 2010 amendments the current level of demand from employers in the global marine industry. Training using a «virtual reality ship» psychologically prepares KSMA cadets for navigation practice on ships of the world merchant fleet, taking into account their position on board, as well as the functional duties they are required to perform in accordance with their positions. Simulators training of KSMA cadets and KSMA Maritime College (MC KSMA), starting in 2014-2015 conducted in the Kherson Maritime Specialized Training Center at KSMA (KMSTC). The use of the immersion method is implemented in the practical part of the course when, after obtaining theoretical knowledge, students have the opportunity to test their knowledge, to actively develop practical skills in conditions close to real professional ones. For the full immersion during the course use the latest simulators and equipment, modern teaching methods, and teachers are active participants of the command staff of real merchant vessels.

Thus, in accordance with the concept of the method of immersion, the educational process in KSMA and MC KSMA is built on the principle of constant repetition and consolidation of already passed material. After passing the basic theoretical material, students have the opportunity to undergo training with the development and evaluation of acquired competences. Prior to the start of the real shipboad practice, students are provided with a complete set of documents and hold all the certificates required to complete the shipboard practice during which they are able to apply the knowledge and skills acquired. Thus, the immersion method overcomes the traditionally established setting for learning as hard work, which generates a drop in self-esteem and initiative and, as a consequence, learning productivity. This method provides students with increasing confidence in their abilities and facilitates the transition from study to self-study. Therefore, the immersion method is used by KSMA both during the training and practical training of cadets, which provides training for highly qualified specialists.

4. Features of the use of remote technologies in the training of future maritime professionals

Modernization and reform of higher maritime education in Ukraine envisages a qualitatively new approach to its organization, which is reflected in state documents: Maritime Doctrine of Ukraine for the period up to 2035, Strategic Plan for the Development of Marine Transport for the Period up to 2020, Strategy for the Development of Seaports of Ukraine for period up to 2038, Regulation on the state system of safety of navigation management. The system of training and retraining of specialists for the marine industry is recognized by the maritime potential of the country and the condition of ensuring the safety of navigation, and conducting marine research and training and retraining of specialists in the marine industry is one of the priorities of national interests of Ukraine in the field of maritime activities [9].

During the last decade, measures have been taken in the maritime education system of Ukraine to integrate the means of information and communication technologies and scientific and methodological support of the educational process, which is caused by Ukraine's desire to form the European Higher Education Area. The Paris Communiqué (2018) [20] on further promoting

the introduction of the European Higher Education Area states that higher education institutions should train students and support teachers so that they can act creatively in the digital environment and enable better use of digital and blended education. Adequate quality assurance improves lifelong learning and flexible learning, digital skills and competences, data analysis, educational research and forecasting, and eliminates regulatory obstacles to the provision of open and digital education.

This trend leads to higher demands on the future professional skills of maritime professionals. Because technology and knowledge are constantly updated, training of maritime specialists should include not only professional knowledge, but also the formed ability to self-organized and self-directed learning, the desire to learn throughout life, the ability to socially interact with the use of modern information and communication technologies.

The use of distance learning technologies (e-learning, m-learning) covers not only individual specialties or educational programs, but is an important strategic tool for the development and positioning of higher education institutions, enhances the innovative potential of the whole organization, and as a consequence increases its competitiveness. The prevailing era of Web 2.0, an era of interactive web resources and communities that allows the user to become actively involved in the processes of their dissemination, discussion and development, as well as the creation of individual learning and social spaces, controlled even from a mobile phone, can not leave the teaching system unchanged in a static web-based academy that only reads them from your computer and doesn't allow communication or interaction. Replacing Web 2.0., Web 3.0 and artificial intelligence are coming, that is why there is a need for a rethinking of learning concepts and the development of new educational environments and strategies. The introduction of distance learning technologies should include: communication and exchange of information at a distance; take into account the individual cognitive abilities of students (personalization); interactivity; mobility and virtual collaboration. All this can be realized in the process of professional training of the cadets of Maritime Academy through the use of electronic and mobile training, virtual and augmented reality technologies in simulators. That is why today he is requesting the direction of development of distance (electronic) education.

According to the current level of development of distance learning technologies in KSMA is the creation and use of software and e-learning tools of various directions, including learning management systems, LMS (Learning Management Systems), which integrate tools for administration, communication, knowledge assessment, development and maintenance of distance learning courses. Thus, in 2019 all the subjects at the KSMA have electronic distance courses created.

In the center of distance education there is an independent learning activity. Nowadays the competence approach is the methodological basis of distance learning. It allows each student to: actively engage in the process of mastering new subject content; learn operational and technical means of performing activities; create your own learning route; independently plan and control the rhythm and tact of training; independently plan and control the level of competence formation.

The ultimate goal of KSMA cadets' training is not the acquisition of knowledge, skills and competences, but the level of achievement of these competencies (the ability to use their knowledge and skills in a particular situation, and even in emergencies). In this regard, the KSMA has chosen directions for improving the educational environment. It should be:

1) less focused on the course of lectures and the acquisition of specific knowledge and more focused on the formation of certain professional competences;

2) adapted to different levels of learning;

3) as close as possible to the individual needs of students;

4) remote materials should be accessible not only 24/7, but also from any device (personal computer, tablet computer, mobile phone) and from any networks (local, global, including satellite in navigation conditions at sea).

In order to implement these trends, a model of distance learning was developed at KSMA and an e-learning website was created (https://mdl.ksma.ks.ua).

In KSMA and the Maritime College of the KSMA (MC KSMA) for the implementation of distance learning, all structural units perform the relevant functions, which are grouped into training, teaching and resource. Educational and methodological functions are performed by faculties, departments and cycle commissions of the KSMA and the MC KSMA. The Resource Function is performed by the Laboratory of Innovative

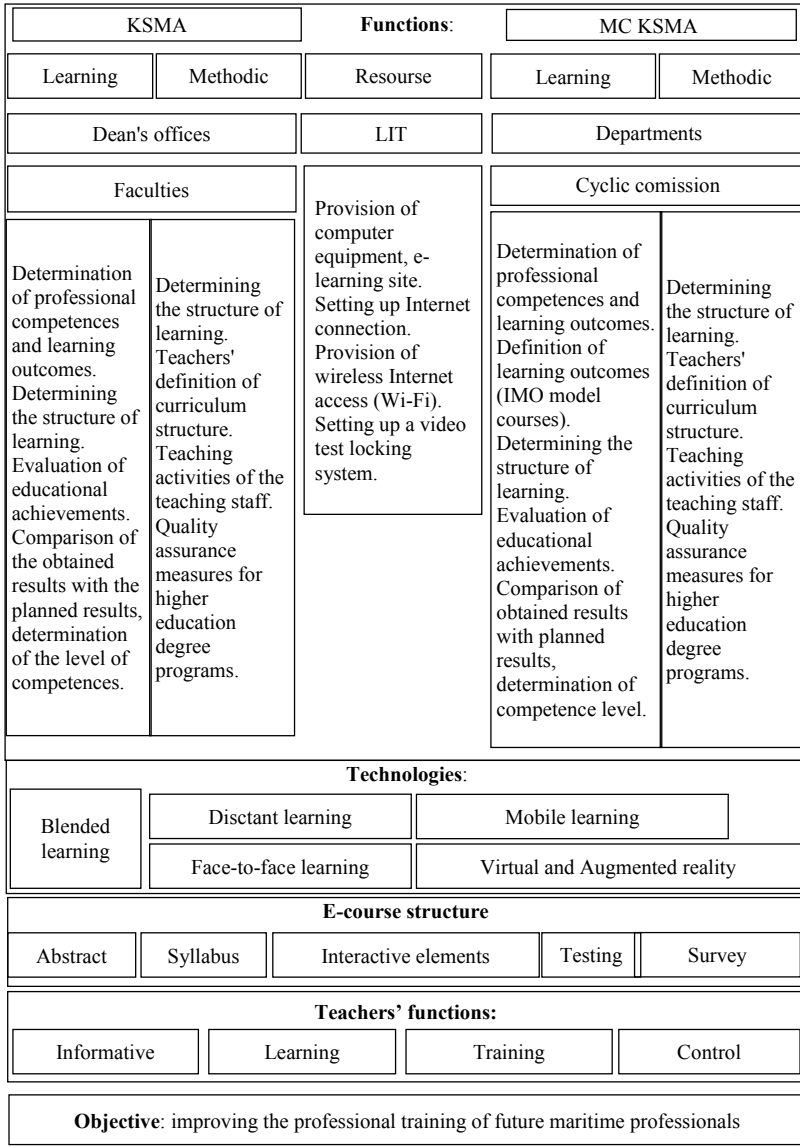

Figure 1. KSMA Distance Learning Model

Technologies (LIT), within the structure of which is the Center for Assessment of Students' Academic Achievement. In the process of training of maritime specialists (students and cadets), KSMA and MC KSMA use:

1) traditional classroom teaching activities under the guidance of an experienced teacher;

2) different ways or mechanisms of delivery of educational materials (printed materials, Internet, mobile networks) and work with them (wiki, glossary work, video making, automated testing, etc.);

3) structured self-study using the experience of direct communication between the cadet (student) and the teacher and the use of on-line educational materials.

The experience of implementation in KSMA and MC KSMA shows that the combination of the traditional system of education with distance learning, blended learning, is the most effective for the educational process, especially in terms of communication between students and the teacher. This is especially important during the dual training of cadets when they are not detached from the learning process while continuing their studies using distance learning technologies.

5. Conclusions

The experience of implementation in KSMA and MC KSMA shows that the combination of the traditional system of education with distance learning – blended learning (the most effective for the educational process), especially in terms of communication between students and the teacher. This is especially important during the dual training of cadets when they are not detached from the learning process while continuing to watch and continue their studies using distance learning technologies.

Thus, during the implementation of the developed model of distance learning technologies application in the professional training of KSMA cadets, the educational potential of the educational institution was revealed. It has been found that interactive information and communication tools of the Internet provide flexibility in the use of time and place of training of cadets and the reality of unlimited educational discourse. In practice, KSMA has proven that it is best to use a combination of synchronous («face-to-face») and asynchronous (Internet) training for the purpose of optimizing the training of future maritime specialists.

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