The Application of E-learning in Maritime Education and Training in China

X. Chen, X. Bai & Y. Xiao
Shanghai Maritime University, Shanghai, China

ABSTRACT: E-learning brings the third wave to Internet applications. E-learning is a new training mode with the open characteristics, which is completely different with traditional training. E-learning teaches students the specialized knowledge of theories, work experience and technology by information networks and computer hardware equipment. Students can through a variety of terminal equipment to learn anytime and anywhere, so as to improve student learning results. Maritime education and training must conform to the trend of times to explore E-learning training to improve the training performance. In this paper, based on the theory of E-learning, comparing the advantages and disadvantages of E-learning training. By analyzing current status of maritime education and training, using E-learning to establish China's maritime education and training of the lifelong education system, using E-learning to promote the internationalization of navigation education and training.

1 INTRODUCTION

E-learning is mainly a kind of learning and teaching activities through the Internet. It has been applied in basic education, higher education, vocational education and so on, and it shows good prospects. Maritime education and training has the characteristics of internationalization, specialization, standardization and sustainability. E-learning also can be applied to the navigation education and training, which helps to solve the problem of Chinese maritime education. This paper analyzed preliminarily.

2 E-LEARNING OVERVIEW

2.1 *The concept of E-learning*

The concept of E-learning was originally proposed at the 1999 Online Learning Conference in the United States. Kekang He, who is a famous education technology theory scholar in China, summed up it as: E-learning refers to a kind of learning and teaching activities mainly through the Internet. It makes full use of learning environment which is provided by the modern information with new communication mechanism and rich learning resources, E-learning implements a new way of learning.

Integrated the above definition, this paper defines the concept of E-learning as follows: E-learning is a new training learning mode, which is completely different from the traditional training and learning. The information network such as the Internet or LAN network is the important foundation of E-learning

training. Through the information network and computer hardware equipment, E-learning teaches professional knowledge theory, work-study experience or technologies and skills to students. Students can study anytime and anywhere through a variety of terminal equipment, thereby enhancing the effectiveness of student learning. It also encourages students make full use of knowledge and skills in their work, and ultimately improves the overall performance of the entire organization or department.

2.2 *The advantages and disadvantages of E-learning*

Compared with traditional learning methods, E-learning using technology advantage, provides students with abundant learning resources, improves the flexibility of learning, to reduce the learning cost, to meet different levels, age, and geographic location of the students' individualized learning needs. Anyone anywhere at any time can study through the E-learning. E-learning represents a kind of more and more advanced education mode that has the rich connotation.

2.2.1 *The advantages of E-learning*

According to IDC statistics, since the 21st century, the E-learning market in America annual growth rate is 83%. Growing so fast, because E-learning as a training mode has its unique advantages.

1 It can reduce the learning cost of various types of training organization or department. According to statistics, the E-learning model compared with traditional classroom model can save nearly 50% of the cost. In training, 40% of the traditional training model expenses is used to transport and accommodation, 7% is used to teaching equipment. E-learning absolutely can save these costs. E-learning can not only greatly reduce the cost of classroom infrastructure, but also reduce travel expenses, shorten the training time. On the other hand, students can attend training and study while working through in-service training. This will not affect the work, but also save a lot of cost, and improve the efficiency.

2 It has strong pertinence, and be able to support personalized learning. E-learning can provide more independent learning space for different learning style students. According to their working time, study habits, learning needs and learning capacity, students can independently adjust learning style, and they can learn the knowledge and skills over and over again, thereby, to improve their efficiency of learning. In addition, the E-learning learning system could be combined with the characteristics of adult training, emphasizes students don't have to learn step by step. They can flexibly choose between autonomous learning and collective learning, to make learning become more freedom and more flexible.

3 It can greatly enhance learning effect. E-learning training system can not only through a simple document infuse traditional theoretical knowledge to students, but also can provide a lot of pictures, audio and video files to make training courses becoming lively and interesting. Let students feel fun in learning, for them creates a relatively relaxed learning environment and atmosphere, To some extent, E-learning training system can reduce student learning and work pressure, which is conducive to the improvement of student learning outcomes.

4 It is beneficial to exert the principal role of students, stimulate the learning enthusiasm of students. Friendly learning interface, human-based service, audio-visual image, these are features of E-learning training system. It can stimulate the students take the initiative to find problems, actively explore the ways to solve the problem. What's more, its rich content and humanized design can more effectively stimulate students' learning enthusiasm, correct their learning motivation.

5 E-learning has the characteristics of resource sharing and rapid updating. Enterprises can use E-learning to develop their own training courses, and put the enterprise accumulated experience and knowledge in the server that all the staff can use the network to learn. At the same time, enterprises can also introduce the world-famous enterprises and authorities, such as the American management association or the Wharton school of business, to develop the classic training course, so that enterprises can learn to the world's leading enterprises the most advanced concepts and skills, easy to update the training content and resources to accelerate the pace of learning new knowledge.
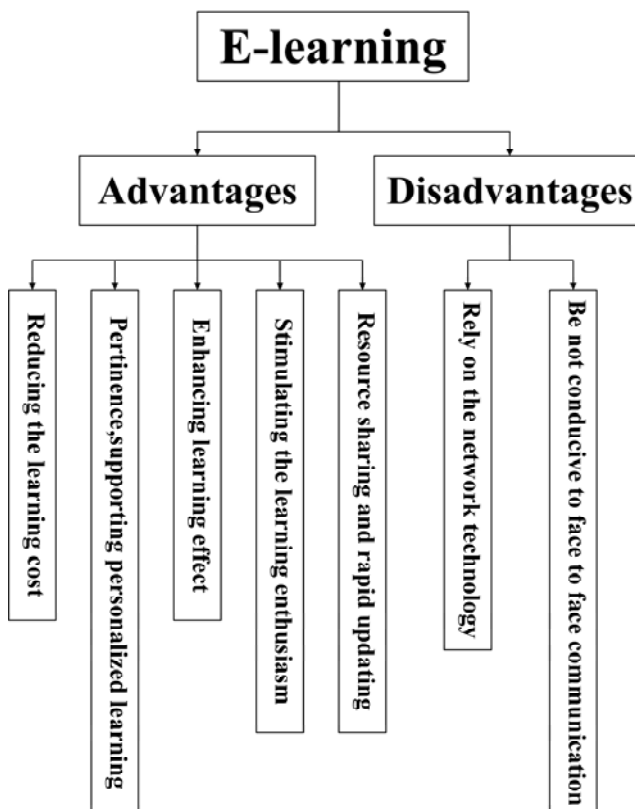

Figure 1. The advantages and disadvantages of E-learning.

The above characteristics of E-learning make it have incomparable advantages over the traditional learning mode. It breaks the unitary structure based on teaching materials in traditional teaching, and eliminates the drawbacks of traditional teaching content lagging behind social development. It has

changed the situation of traditional teaching being restricted by time and space, and made up for the lack of passive acceptance and the lack of awareness of self-construction. It is these advantages give E-learning with infinite vitality that make it become a kind of new learning mode which is worth to be in-depth discussed and extensive promoted.

2.2.2 *The disadvantages of E-learning*

E-learning has many advantages, but it is not perfect. Because of E-learning excessive dependence on network or information equipment, it inevitably has some disadvantages.

1 Network, information equipment is the supporter of E-learning. The existence, development and using of E-learning relies heavily on the construction of information infrastructure. Whether the infrastructure is complete or not directly determines the development level of E-learning, which reflects the dependence of E-learning on the vulnerability of information network technology. If the network paralysis, servers can't response or student's personal computer malfunction, it will directly bring greatly negative influence to the E-learning. In severe cases, it will lead to E-learning cannot continue to use or develop.

2 E-learning goes against face to face communication between teachers and students or students with each other. From the technology development and application, E-learning has been realized the technical interaction, such as telephone conference, network video and so on. However, compared with the traditional face-to-face interaction, E-learning is still lack of direct emotional communication, more reflects the "human-computer interaction". Without the face-to-face communication between teachers and students or students with each other, the effect of study will be influenced. Related studies have shown that when students are in a team learning environment and atmosphere, their learning effect will be better, learning efficiency is also higher. Now, more and more organizations or departments have been aware of this. They began to accept blended learning theory, which still emphasize traditional face-to-face training methods besides using the E-learning for network training and learning.

3 THE SUITABILITY OF E-LEARNING IN MARITIME EDUCATION AND TRAINING

3.1 *The characteristics of maritime education and training*

Maritime education and training undertake an important mission of cultivating navigation specialized personnel. In the developmental process of shipping industry, Maritime education and training plays a fundamental, overall and important role. Due to the characteristics of shipping industry, maritime education and training has the characteristics of internationalization, specialization and standardization. Meanwhile, seafarers have the characteristics of dispersion, big fluidity while it is difficult to massed learning.

The characteristics of the internationalization of navigation education and training is decided by the internationalization of navigation and shipping industry. Seafarers manipulated the ship which is built according to the standards set by the International Maritime Organization (IMO). According to IMO navigation rules, the ship can sail around the world. Sailors from different countries can apply for a job in the international shipping talented person market. The same boat crew may have come from different countries, in addition to language communication problems, cross-cultural integration and communication are put forward new requirements for the internationalization of maritime education and training.

Maritime education and training also has the characteristics of specialization and standardization. In order to ensure ship navigation safety and efficient transportation, to prevent marine pollution, maritime education and training, strictly regulated by the STCW convention and the rules and regulation of the national authorities. STCW convention as well as demonstration tutorial provide a guarantee for maritime education and training of specialization and standardization.

In addition, the continuous improvement of shipbuilding and maritime technology as well as constant revision of the convention, make continuing education occupies an important position in the maritime education and training. From the GPS, GMDSS, ECDIS, AIS and other new technology and equipment training to update the content of new convention, amendment and rules, all seafarers need to continue to receive further education and knowledge update that be able to have the work of competency.

3.2 *The E-learning suitability of maritime education and training*

In the field of maritime education and training, there are problems that shortage of qualified teachers and relatively high cost of training in the world. E-learning can hire highly experienced instructors to provide high-quality and relatively inexpensive courses that address both the high level of teacher shortage and the high tuition fees that students in school learning and become a win-win Learning model.

E-learning model can provide more convenient learning conditions to meet the needs of the crew in different parts of the world free to arrange time to learn. For the rapid development of technology and the continuous revision of the Convention, E-learning can better meet the needs of seafarer knowledge update.

E-learning has highly internationalized characteristic, higher education and innovative talent training advantage, the applicability of the vocational education and continuing education and so on. These are perfectly compatible with the modern maritime education and training needs.

In addition, a series of demonstration tutorials developed by IMO provided the conditions for the standardization of the course. The STCW

Convention's Manila amendment recognizes distance learning and E-learning, laying the foundation for the application and development of E-learning, which is a new teaching model for maritime education and training.

4 THE E-LEARNING STATUS OF MARITIME EDUCATION AND TRAINING

Nowadays, more and more schools, classification societies and enterprises are participating in the development and application of maritime education and training E-learning. Some maritime colleges and universities have launched network courses, such as: California Maritime Academy developed the E-learning "maritime security" and other courses; Singapore Maritime Institute and Tele data Maritime Solution cooperation using online teaching and in-school training to provide appropriate E-learning courses required by the competency certificate; the University of Plymouth in the UK has done a lot of research in E-learning, and opened a number of E-learning courses. In addition, classification societies and regional organizations, such as the Baltic Shipping Council, Lloyd's Register, launched a series of e-learning network training courses. Some shipping companies, such as OOCL and China Shipping Group, provide some continuing education E- Learning courses. E-learning courses have also been introduced by a number of commercial maritime education and training institutions, which have played a significant role in the continuing education of seafarers and knowledge renewal. Such as the Aliquot Training & Consultancy Service, which is headquartered in the UK, offers several STCW-compliant training courses. Seagull AS, headquartered in Norway, provides training courses and assessment tools for seafarers in compliance with the STCW, ISM and IMO conventions, as well as traditional classroom courses, onboard courses emphasizing skills training. It is convenient students from all over the world to learn remote E-learning courses. Many of the courses have been recognized by the authorities of the flag State.

Although some of China's maritime education and training colleges in the campus network have constructed network teaching platform and introduced E-learning courses, using the platform has the MOODLE, Sakai or Blackboard, but overall at an initial stage, the current situation is to provide E-learning curriculum is limited, and there is no complete curriculum resources from the test to test all the links, and some only pages, there is no substance, the overall behind abroad in the E-learning aspects of hardware and software construction.

5 COUNTERMEASURES AND SUGGESTIONS

As an important component of the shipping industry, maritime education and training has a crucial impact on the development of the shipping industry. China owns the largest number of seafarers around the world. But the quality and competitiveness of Chinese seafarers still need to improve, and there is a certain gap to be a power country in seafarers' number.

The current problems in China's maritime education and training are: some colleges and training institutions only pay attention to assessment examination, The exam-oriented education is more and more obvious; professional navigation construction, teaching reform and innovation is slow [6]; short of professional teachers in quantity and the level of teaching to be improved [7]; the quality of specialized personnel and international level are not high, lack of competitiveness in the international seafarer market [8].

E-learning as a new teaching model, embodies a new educational philosophy. It utilizes the latest technologies to provide low-cost and high-quality teaching resources, that will be helpful in solve the problems facing in maritime education and training. In order to promote the application and development of E-learning in Chinese maritime education and training, the author puts forward the following countermeasures and suggestions:
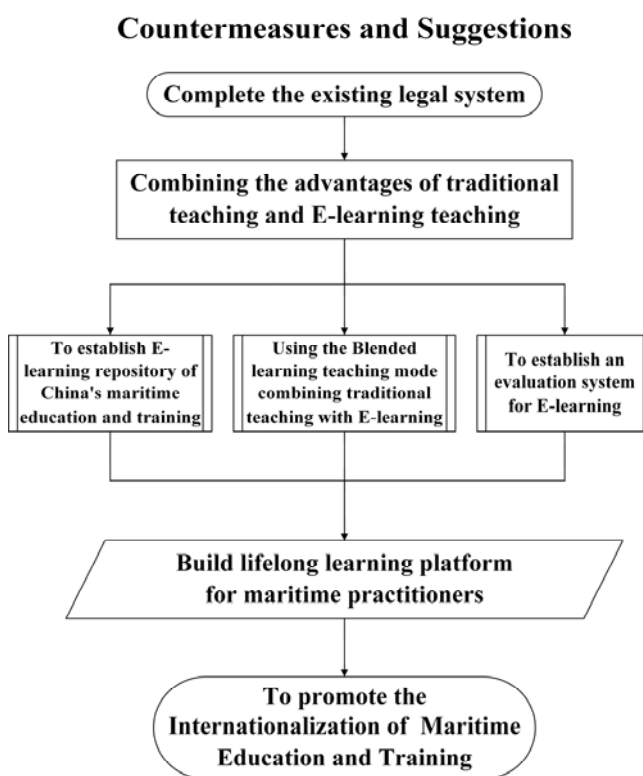
Figure 2. The flow chart of the countermeasures and suggestions of E-learning.

5.1 *Complete the existing legal system*

March 1, 2012 The newly revised People's Republic of China crew education and training quality management rules and People's Republic of China seafarer examination assessment and certification of quality management rules, come into effect, the implementation of these rules requires maritime education and training institutions and institutions to establish Quality standard system, and take effective process control to ensure the quality of teaching. April 1, 2014 the newly revised Regulations of the People's Republic of China crew training, come into

effect, and the implementation of the rules take a detailed provision on the types and projects of crew training.

The Manila Amendment to the STCW Convention endorsed modern methods of seafarers' education and training, including distance learning and E-learning. Provisions of the competent authorities may according to A–I/6 chapters and the substantive guidance contained in convention, recognition seafarers training, by means of distance learning and E-learning, seafarers shall confirm with the competent authority of the training methods, and verify the related facilities that the company can provide.

It is suggested that the relevant Chinese authorities, in accordance with the Manila Amendment to the STCW Convention, clarify that distance learning and E-learning have become one of the methods of maritime education and training by revising or improving existing Chinese laws and regulations, and applying E-learning to create conditions in maritime education and training.

5.2 *Combining the advantages of traditional teaching and E-learning teaching*

In accordance with the requirements of STCW Manila Amendment, on the training goal, professional and curriculum construction, combined with the advantages of traditional teaching and E-learning teaching, integrating traditional teaching and E-learning on teaching resources, learning mode and evaluation mode.

5.2.1 *To establish E-learning repository of China's maritime education and training*

The establishment of maritime education and training E-learning repository can achieve the integration of teaching resources. The content of maritime education and training E-learning repository is rich and varied, the database should also be multipath. Therefore, it is difficult to make an E-learning resource library by just one school, a teaching department or a few teachers.

With the development of Internet technology and educational concept, the emergence of large-scale online public courses MOOC has caused widespread concern in the global education community. On the basis of E-learning, MOOC has more powerful and multi-functional support platform, more perfect education and educational technology concept. Some of China's top universities have made use of foreign MOOC platform or independent platform to build online new education curriculum, and promote the opening and sharing of quality education resources, to provide a wider range of education services for higher education, and even the whole society.

For the navigation education and training repository, teachers and students should play the initiative to take the inter-school, school-enterprise joint construction, resource sharing. China's maritime education institutions and training institutions can use the quality of maritime education and training E-learning resources at home and abroad, to achieve leapfrog development. To build China's maritime education and training E-learning repository to enhance the overall strength of China's maritime education and training, when conditions are ripe, we can output China's maritime education and training E-learning resources abroad.

5.2.2 *Using the Blended learning teaching mode combining traditional teaching with E-learning*

Blended learning is combined the advantages of traditional teaching and the E-learning, both to play the guiding role of teachers, but also to fully mobilize the students' learning autonomy and enthusiasm. Using a variety of teaching methods of Blended learning, students can learn knowledge after the class, and in the class for questions and answers, skills training, teacher-student interaction and finish homework. The use of limited time to meet the needs of theoretical teaching and practice. On the one hand, it can improve students' self-learning ability and comprehensive skills, on the other hand, it greatly promotes the students' innovation ability.

5.2.3 *To establish an evaluation system for E-learning*

In view of the characteristics of maritime education, such as job orientation, international universality, legal stipulation and professional standard, maritime education quality and professionalization should be combined organically. Education authorities and transport departments in the joint development of navigation professional standards and norms, should develop an appropriate assessment examination mechanism for the applications of E-learning in maritime education and training, make navigation education not only conform to the requirements of the Manila Amendment to the STCW Convention from the professional, but also improve the overall quality of students as navigational professionals.

5.3 *Build lifelong learning platform for maritime practitioners*

The rise of E-learning model helps students to learn any knowledge they want to learn at anytime and anywhere. It has positive significance for the establishment of continuing education and lifelong education system and the construction of learning society.

Due to the professional needs of seafarers and shipping industry practitioners, continuous learning and knowledge renewal are required throughout their careers. E-learning mode is free from time and geographical constraints, providing the most convenient way for the professional needs of continuing learning and lifelong learning. It is suggested to set up the distance education system of maritime education and training, make full use of E-learning, improve the E-learning curriculum resources and assessment system, and build a platform for continuing learning and lifelong learning for maritime practitioners.

5.4 Using E-learning to promote the internationalization of maritime education and training

Internationalization of maritime education and training includes both the introduction of advanced international teaching ideas and teaching resources, including exporting China's outstanding educational resources. Ministry of Transport and the Ministry of Education issued a joint statement clearly pointed out that they support maritime college to recruit overseas students to carry out overseas education. It is recommended that maritime academies establish an E-learning platform or cooperate with renowned international maritime education and training E-learning companies to transfer the Chinese nation's excellent culture and China's high-quality maritime education and training E-learning resources to the world.

6 CONCLUSION

As a new learning model, E-learning has advantages of rich learning resources, flexible learning time and independent choice of learning methods to provide a good learning platform for students. Efficient and convenient personalized learning model favored by the more and more students. The application of E-learning in maritime education and training will help to solve the current difficulties in maritime education and training, and create conditions for the improvement of maritime education and training in China. China's maritime education colleges and training institutions should seize the opportunity to actively promote the development of maritime education and training.

REFERENCES

He,K.K. 2003. The deepening reform of E-Learning and higher education. *China Educational Technology* 02(2):8-9.

Pan,Y.L.2011. E-learning training research in Xiamen maritime bureau.

Wang,Y.M & Jin,Y.X. 2011. Internationalization of maritime education through institutional collaborations: A case study of Shanghai Maritime University. *International Conference IML*A19.

Zhang,J.L.2011. Current situation and countermeasure of maritime professionals continuing education. *Maritime Education Research* 11(4): 274-275.

Lu, X.Y. E-learning in the application of the maritime education and training. *Maritime Education Research* 15(1): 16-20.

Meng, X.W. Impacts of the Manila Amendments of STCW Convention on Chinese seamen 's education and training and countermeasures. *Maritime Education Research* 10(3): 3-4.

Li, K.S. 2013. Problems and suggestions on education and training of current seamen.

Ma, Q. & Song, X.G. 2013. Construction and application of international talents for navigation specialty. *Maritime Education Research* 13(4):21-24.

IMO.2013. International transport Workers' Federations: A guide for seafarers Taking into Account the 2010 Manila Amendments. London: 13: 49.

Chen, Z.H. 2009. Constructing the characteristic teaching resource database to promote the education and teaching. *China Edu Info* 09(13) :31-33.

Papachristos. D, Nikitakos. N, Lambrou. M.A. A Neuroscience Approach in User Satisfaction Evaluation in Maritime Education. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 7 No. 3 - September 2013.

Kadioglu. M. Information and Communication Technology (ICT) Training Application for MET Institutions. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 2 No. 1 - March 2008.

Papachristos. D, Nikitakos. N. Evaluation of Educational Software for Marine Training with the Aid of Neuroscience Methods and Tools. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 5 No. 4 - December 2011.

Sirris. I, Nikitakos. N. Game Based Learning for Seafarers. A Framework for Instructional Game Design for Safety in Marine Navigation. *TransNav, the   Journal* Vol. 1 No. 3 - September 2007.

Doyle. E. The Public Private Partnership Model on Which the National Maritime College of Ireland Was Conceived and Delivered. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 1 No. 4 - December 2007.

Bao. J, Xu. M. Examining and Promoting Chinese Seafarer Education and Training. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 2 No. 1 - March 2008.

Cicek. K, Er. I.D. Economic Constraints on Maritime Training and Education in Turkey. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation* Vol. 2 No. 2 - June 2008.

Ali. A. Maritime Education – Putting in the Right Emphasis. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 3 No. 2 - June 2009.

Hanzu-Pazara. R, Arsenie. P, Hanzu-Pazara. L. Higher Performance in Maritime Education through Better Trained Lecturers. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 4 No. 1 - March 2010.

Doromal. A.C. Standard for Quality Assurance: the Case of Philippine Maritime College. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 4 No. 1 - March 2010.

Dong. W.H. Research on Maritime Education and Training in China: A Broader Perspective. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation,* Vol. 8 No. 1 - March 2014.