

Research on Maritime Education and Training in China: A Broader Perspective

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ABSTRACT: China's Maritime Education and Training (MET) has been providing numerous talents for its shipping industry in the past decades. However, the traditional Chinese MET emphasized more on crew training but ignored shipping services' fields. This paper firstly redefines the concept of MET from a broader perspective, then outlines the current status quo of MET in China from the new broader angle, consequently analyzes the main problems of Chinese MET, and finally proposes suggestions for regarding governments, institutions, as well as shipping companies, aiming to offer valuable ideas during the process of decision-making.

1 INTRODUCTION

Traditionally, people defined Maritime Education and Training (MET) as an educational system which aimed to provide seafarers for merchant vessels, however, with the development of shipping industry, it is necessary to redefine the conception of MET from a broader perspective to cover more aspects such as maritime finance, maritime security, as well as some rare maritime disciplines in shipping markets.

Although MET in China has played a significant role for its shipping industry which was among the world's top five by the end of 2012, there are still some fatal shortcomings which may hinder the continuous rising of Chinese maritime economy. At the present stage, the Chinese MET focuses mainly on seafarers training, offering plenty of qualified ratings, officers, managers, as well as some teaching and researching staffs for shipping industry. However, if looking through the whole shipping industry from the broader perspective, it can be easily fixed that MET in China still at the bottom of the industrial

chain, which means that it still has a long way to go to fill the gap between the demanding and supplying especially in maritime services' fields. For the purpose of solving this problem, regarding departments including government, educational institutions and shipping companies should on one hand carry out their own duties respectively, and on the other hand try to collaborate with each other as much as possible. Only in this way can keep triggering the engine of Chinese shipping industry, making it from big to real powerful.

2 THE DEFINITION OF MET

It was traditionally suggested that the first school of MET was established by Infante Henry in 1419 [1], since then, MET was gradually developed and provided enormous talents for shipping industry. In the early stage, the function of MET was to train ratings and officers for naval and merchant ships; afterwards, with the continuous expanding of

shipping industry, MET was required to cultivate high-quality maritime manpower at all levels, it meant that not only qualified seafarers who had excellent ship handling skills were needed, but also people who had good theoretical foundation, as well as strong adaptability and potential which made them outstanding personnel in maritime teaching, researching and management, should also be included [2]; presently, shipping markets are no longer limited to transportation and management as before, but has progressed to be a giant industry which covers more aspects including maritime finance, brokerage, law, insurance, etc, in this case, it's better to broaden the conception of MET to meet the demands of talents for shipping industry. This paper redefines the conception of MET as an educational system whose objective is to cultivate people to be competent in areas of ship building and maintaining, ship operation, maritime management and services (including maritime finance, maritime brokerage, maritime law, maritime insurance, etc), as well as maritime teaching and researching, etc.

3 MET IN CHINA

The Chinese shipping industry has been surging in the last three decades with the speedy developing of economy, together with the corresponding MET which provided qualified maritime human resources. As per the new definition, the Chinese MET generally comprises three parts: typical MET which focus on seafarers' education and training, maritime services' education, and other education and training on rare subjects such as maritime archaeology.

3.1 Typical Chinese MET

The typical Chinese MET is responsible for educating people to be qualified seafarers and maritime managers in shipping companies, as well as some teaching and researching staffs in regarding maritime colleges and institutes. In the past decade, typical Chinese MET cultivated about 195 000 maritime graduates at different levels [3], by the end of 2012, registered crews educated by the typical Chinese MET has reached up to 1039552 which covers 10.3% of the world's ship officers and ratings [4]. During the process of expanding, the typical Chinese MET has gradually developed to be a multi-level educational system which generally comprises the following types.

- Higher MET which integrates vocational MET with degree education. It is normally a four year's "consistency" program compared to the "sandwich" mode. Students are expected to develop an understanding of elements of maritime theory and the expertise of maritime practice by going through basic courses such as mathematics, computer skills, maritime English, etc, and specialized courses, accompanied by STCW (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers) training for ship officers. During the process of cultivating, the school takes responsible for teaching, training, and courses examination,

while MSA (China Maritime Safety Administration) for supervision and evaluation of STCW training. Only if those who finish with all courses and training, as well as on board practicing which lasts for about one month provided by the school and MSA are eligible to take exams of Ship Officer's Certificates of Competency before graduation. People who pass the exam will not only get their diploma and bachelor's degree in maritime sector, but also a qualified testing score paper to indicate their qualifications to be a ship officer. By holding this paper, alongside with more than 12 months cadet experience on board ship after graduation, they will finally get the real Ship Officer's Certificates of Competency issued by China MSA. Most of the graduates are expected to be ship officers, managers in shipping companies, while others may become teaching and researching staffs after a higher level study in master or doctor program. Presently, there are 15 higher MET colleges and institutes [5] in China, providing hundreds of senior shipping professionals for shipping industry, table 1 shows the recruitments in the past five years.

Table 1. Number of Recruitments from 2008 to 2012 (Higher MET)

Year	2008	2009	2010	2011	2012
No.	4604	4589	4475	5723	5271

Data Source: China MSA

- Senior Vocational MET which concentrates on ship officer's training. Different from the Higher MET, Senior Vocational MET aims to train individuals to be ship officers who are going to rely on the expertise and professionalism of navigation, It will take 3 years to finish this program during which students are mainly focus on ship handling and management, as well as STCW training, but not too much basic theory learning. Likewise the Higher MET, China MSA is responsible for supervising and assessing the quality of education and training to make sure the future officers meet the demands of STCW. Individuals who finish with their courses and STCW training are able to apply for the examination of Ship Officer's Certificates of Competency before leaving school, once passing, the passing result, combined with above 12 months cadet's sea experiences will reward them of real ship officer's certificates. According to statistics released by China MSA, the number of Senior Vocational MET colleges and institutes scattered across China was 25 at 2010, becoming the main source of Chinese ship officers, table 2 shows the statistics:

Table 2. Number of Recruitments from 2008 to 2012 (Senior Vocational MET)

Year	2008	2009	2010	2011	2012
No.	9182	11026	12829	13050	9683

Data Source: China MSA

- Junior Vocational MET which focus on training of ship ratings. Chinese Junior Vocational MET is the main source of ratings which are very essential for

ship handling. The entry qualification for this program constitutes two elements: one is physical requirements of STCW; the other is 9 years' compulsory education in which the 3 years high school studies are not included compared to the previous two types of MET. The 3 years program will equip individuals with detailed knowledge and activities of crews working on board ships. To achieve this objective, they will firstly conduct regarding STCW training, then go through some basic ship operation theories, and finally exercise their professional skills in corresponding subjects such as steering practicing for helmsman. Similarly, only if those who successfully pass the examination of Rating's Certificates of Competency, are eligible to apply for Rating's Certificates of Competency after practicing on board ships more than 6 months [6]. As the main supplier of ship ratings, Chinese Junior Vocational MET schools increased with the number of 28 at 2010 and delivered lots of ratings. Table 3 describes the situation:

Table 3. Number of Recruitments from 2008 to 2012 (Junior Vocational MET)

Year	2008	2009	2010	2011	2012
No.	15472	18318	23324	15767	7349

Data Source: China MSA

Besides the three major Typical MET modes mentioned above, there are still some other MET modes which include two-years' MET for becoming ship officers quickly without diploma, one-year's quick training to be officers for those graduates from universities, and correspondence MET for promoting diploma in maritime fields (e.g. from junior college to undergraduate), etc. In 2012, there were 40 schools across China to provide such form of MET. Table 4 illustrates the number of recruitments in the past five years:

Table 4. Number of Recruitments from 2008 to 2012

Mode	2008	2009	2010	2011	2012
2 Years MET	7876	5240	5017	4804	2799
1 Year Graduates	1524	1417	1353	1025	485
Correspondence MET	5652	5588	6971	3544	2573

Data Source: China MSA

In addition, Further MET which provides further training for both officers and ratings are also must be included. It is compulsory for seafarers to promote their maritime knowledge and skills periodically to meet the requirements of STCW, hence making the Further MET to be one of the major mode. It supplies individuals with maritime trainings at all levels from rating to captain who will decide the very level to participate as per their experiences and further career development demands.

3.2 Chinese Maritime Services' Education

China has made great achievement in shipping hardware construction such as ships, ports, cargoes, etc. Specifically, by the end of 2012, Chinese fleet (owned and controlled) has increased to 10.1% of

world total, and global seaborne trade share including import and export reached 19% all over the world [7], making 7 ports in China to be world's top 10 throughout ports at the same year [8]. To keep developing shipping industry in a healthy and stable way, there must be some strong supports from maritime services' education whose function is to cultivate talents of maritime services in maritime finance, maritime brokerage, maritime law, as well as maritime insurance, etc. Generally, Chinese maritime services' education performs as the following modes:

- Higher Education for Maritime Services

Higher education has always been the major source of high-level talents, the maritime services' sector are with no exception. Presently, there are approximately 30 colleges and institutes in China providing students with maritime finance, maritime law, and maritime economy studies at different levels [9]. Take Shanghai Maritime University (SMU) as an example, it sets up some relevant maritime services' programs for individuals based upon its historical maritime reputation. More precisely, BSc (Bachelor of Science) Shipping Management offers students with knowledge and specialist skills in areas like shipping economy, international trade, international legislation, as well as shipping operation, etc [10], those from this major are expected to work in the field of brokerage; BSc Maritime Finance originated from 'BSc International Finance' which was established in 1994 and changed to the present one in 2001 to cultivate talents for shipping finance; LLB Maritime Law are expected to provide excellent foundation for a career in international maritime law, commerce and related industries, etc.

It will take three to four years to complete each programme based on the credit system through which students will get their degree once they acquire enough course credits required by a particular major. Generally, the first year is for foundation courses, and the remaining two to three years are for specialized courses, people have the right to decide how many courses they are going to be engaged in each semester as per their timetable, but all have to pass the final thesis defense on the basis of enough course credits. Table 5 displayed the recruitments of each major mentioned in this section of SMU in the past five years.

Table 5. Recruitment of Maritime Services' Education of SMU

	2009	2010	2011	2012	2013
Shipping Management	220	206	227	195	231
Maritime Finance	90	89	81	Unavailable Temporarily ①	
Maritime Law	158	160	146	97	141

Data Source: Recruitment Office of Shanghai Maritime University

(Note ①: Students are categorized as the main class of 'Economy' until the end of the second year during which they can choose their own major to be 'Maritime Finance' or other major included in 'Economy'.)

- School-Enterprise Joint for Maritime Services' Education

In recent years, it's hard for higher education of maritime services to meet the growing demands for higher shipping talents brought by the boom of Chinese shipping industry both in quality and quantity, hence the government encourages more enterprises to train their own maritime services' manpower, which results in the School-Enterprise Joint model. On 24th March 2010, Shanghai Jiao Tong University and Baltic Exchange signed a Memorandum of Understanding on cultivating higher professional personnel in maritime brokerage and maritime finance, aiming to provide qualified people for the establishment of Shanghai International Shipping Center by means of "International Experiences, Chinese Requirements, Real Case Study and Bilingual Teaching" model [11]. Besides, on 25th Nov. 2011, Dalian Maritime University collaborated with Far East Horizon Company to nurture maritime financial talents at a master level, trying to offer higher shipping financial personnel [12].

- Further Maritime Services' Education

One of the most reasonable factors which restrict the development of Chinese higher maritime services' talents is the high threshold. To be a real international maritime services' talent, the four elements must be required: (a) adequate maritime knowledge and background; (b) English proficiency; (c) global perspective; (d) worthy experiences. And to achieve these goals, one must study continuously both in working and spare time. Correspondingly, further study colleges and institutes such as Shanghai Advanced Institute of International Shipping (SAIIS) were established for those who are eager to be outstanding in maritime services' sectors. Founded in 2012, SAIIS launched Shipping Financial EMBA (Executive Master of Business Administration) Course with its first phase of approximately 30 students on 6th Dec. 2013, and will release more programmes in the near future. Teachers in SAIIS are globally recruited from some distinguished universities and institutes such as Cambridge University and Cass Business School [13].

3.3 Rare Maritime Discipline Education in China

Chinese maritime regarding education currently focus on many common areas including typical seafarers training, maritime law education, and shipping management, etc, yet, those rare but significant disciplines such as maritime archaeology, maritime sports, and hydrographic surveying, etc, are rarely involved. Fortunately, few colleges and institutes are conscious of the adverse situation and start establishing such kind of majors to meet the demands of markets. For example, Wuhan Institute of Shipbuilding Technology launched a programme named Yacht Design and Production, offering knowledge and skills in a wide range of sectors related to yacht including yacht materials and manufacture, yacht engineering systems, yacht design and production technology.

4 MAIN PROBLEMS OF CHINESE MET

Although Chinese MET made great contribution to the shipping industry both in China and overseas since its first modern shipping discipline established at Shanghai in 1909, there still some issues should be concerned.

For one thing, from the typical Chinese MET aspect, the average enrollment of students is numerous, reaching 43334 singles annually in the past five years, which is strongly contrary to the lack of funding, experimental facilities and teaching staffs, leading to a relatively lower quality of graduates. Take the teacher-student ratio in SMU for example, it steps over the bottom line of 1:18 to a level of approximately 1:25. According to a survey for 48 maritime schools carried out in 2011, and taking 10% annually growing rate into consideration, the present average government funding for maritime students are 250 pounds per each every year, among which the amount of higher education are 580, with the senior and junior vocational education 140, 20 respectively. If plus the tuition, the number is going to be 870 on average [14]. For another thing, the curriculums are apparently heavy on theory and light on practice especially for on board practicing procedure during which the school is only responsible for little proportion but leave over more to the company after graduation, it consequently leads to an increasing of time consuming of the cultivating circle, even to some extent result in an incomplete crew education process for those who have no chance to work on board ships, causing a huge waste of maritime educational resources, as well as maritime talents. Moreover, there are sorts of further educational programmes for seafarers, but almost all of them are concentrate on direct promotion of crew rankings from lower to higher level, few working on a transitional career development from sea to shore, which is really a great loss to crews and shipping companies because the extraordinary experiences they obtained from sea are quite valuable for both themselves and shipping firms on land-based position.

Viewing from the maritime services' education dimension, problems are more complicated. In the first place, the quantity of regarding schools, disciplines and corresponding students is quite far small compare to the huge shipping market of China, reasons for this phenomenon are multiple, one is because the Chinese national maritime strategy focus more on the hardware construction than software circumstances in the past several decades, the other is the lack of historic maritime culture which would have brought more individuals understanding and getting into shipping industry. Secondly, the quality of maritime services' educational components including teachers, students and curriculums does not really meet the requirements of the speedy developing of shipping market. For teachers, the characteristics of maritime services require a globalized perspective and relevant field background which they don't really have more; and for students, English has become the biggest obstacle for their career development no matter how hard they are doing; as for the curriculums arranging and implementation, almost all schools are trying to make their courses all-embracing in every major, aiming to

produce omnipotent graduates in maritime fields, which finally leads to a opposite consequence.

In the particular rare maritime discipline education area, China plays an infant role all over the world and still has a long way to go.

5 SUGGESTION AND PREDICTION

- 1 To resolve those problems mentioned above, not only should all regarding units including government, schools, enterprises, as well as the whole society perform their duties correctly, but also some measures or reforms should be taken.
- 2 Increasing Funding. As can be seen from the statistics listed before, although the government is gradually aware of the important of maritime sector year by year, funds for maritime education whose particularity determines more money than other normal majors still remain at a very low level. Thus the government should take the reality into consideration and allocate more capital to this field in order to bring more facilities and more chance of practicing which may improve the quality of graduates directly.
- 3 Adjusting Strategy. The development of Chinese shipping industry needs strong support from maritime services' talents, but maritime education in China are staying in operating-centered level, hindering the balance of maritime manpower markets in which seafarers are far more than enough while higher maritime services' people are short. Based on this situation, the government ought to change the maritime educational strategy opportunely to fulfill the demands of shipping industry. Specifically, on one hand, lowering the ratio of typical Chinese MET , on the other hand, raising investment of maritime services' education both on personnel and financial resources.
- 4 Modifying Curriculums. The curriculums of Chinese MET focus more on theory learning but less on practicing which is critical to educating shipping talents. It is necessary for schools to reform their course structures, and to penetrate more experimental sections into routine teaching and learning. In addition, providing teachers with more opportunities of front line to accumulate their practical experiences should be a good solution.
- 5 Accelerating Cooperation. School-Enterprise mode has been recognized as an efficient way in maritime education. In the first stage, regarding companies should propose their conception of demands for maritime talents regularly in order to deepen schools' understanding of qualified people, at the same time providing schools with more funding and practice opportunities. In the second place, schools should perfect the cultivating proposal and strengthen teacher's professionalism gradually as per enterprises' suggestion, so as to enhance the qualities of graduates. Moreover, both sides can even try the 'ordering' mode to accelerate collaboration between each other.
- 6 Improving Further Education. Well further maritime educational linking system is unique for improving the quality of shipping talents. On one

hand, it provides seafarers who are willing to work ashore with better choices, maximizing the usage of their sufficient sea experiences; on the other hand, it becomes an important talents source of maritime services' field whose threshold are higher than normal subjects. Therefore, the government and society should set up more further maritime educational institutes to fulfill the maritime educational system, and exiting colleges and institutes should also design and launch more proper programmes for further maritime education according to the requirements of shipping market.

- 7 Disseminating Culture. To large extent, people's interest in the culture of a particular field determines the will of joining, but it seems that people in China know little about maritime sector unless they participating in occasionally. It's vital for government to produce maritime videos and other types of advertising, demonstrating more details about shipping industry to the whole society. Furthermore, by utilizing some particular festivals such as Chinese Navigational Day celebrated on 11th July every year, people can organize a variety of activities, aiming to disseminate maritime cultures to individuals across the country.

6 CONCLUSION

This article attempts to provide a comprehensive overview of maritime education and training in China from a broader viewpoint by redefine the concept of MET. By illustrating its present status from different dimensions, and describing disadvantages from different views, we can acquire that Chinese MET is still remain at the first stage of maritime educational system. To alter this unfavorable phenomenon, government and school, as well as the whole society should on one hand implement their duties cooperatively and on the other hand to carry out reforms in defective aspects including funding, strategy and teaching mode, etc, triggering Chinese MET developing to be more comprehensive with high quality.

REFERENCES

- [1] Wikipedia. (2014) *Henry the Navigator*. [Online] Available from: http://en.wikipedia.org/wiki/Henry_the_Navigator. [Accessed: 18th January 2014]
- [2] Dong, F. (2005) Some Observations on the Undergraduate Maritime Education in Chin. *Maritime Education Research*. (3).p.1-4.
- [3] Liu, Z. J. (2013) Improve the Quality of Maritime Education by Grasping the New Trend. *Maritime Education Research*. (3). p.7-12.
- [4] China MSA. (2012) *Seafarer's Annual Report of China* – Beijing: China MSA.
- [5] Education Online. *Universities Carrying Maritime Education*. (2014) [Online] Available from: <http://gkcx.eol.cn/soudaxue/querySchoolSpecialty.html?zycengci=%E6%9C%AC%E7%A7%91&bkzytype=&zkytype=&keyWord1=%E8%88%AA%E6%B5%B7%E6%8A>

- %80%E6%9C%AF&form=form&x=28&y=4. [Accessed: 16th November 2013]
- [6] Ministry of Transport, P. R. China. (2012) *Regulations on Examination and Certification of Competence for Seafarers of the People's Republic of China*. [Online] Available from: http://www.moc.gov.cn/zhuzhan/zhengwugonggao/jiaotongbu/jiaotongbuling/201201/t20120119_1187249.html. [Accessed: 18th December 2013]
- [7] Scott, R. (2013) *Maritime Policy in Developing Countries: China*. [Lecture] Maritime Policy. Greenwich Maritime Institute. Room QA10, 13th November 2013
- [8] China Shipping Database. (2013) *Top ten Throughout Ports in the World*. [Online] Available from: http://www.shippingdata.cn/index_gkmt.html. [Accessed: 16th November 2013]
- [9] Wang, H. W. (2011) *A Study on Training Mode of International Shipping Talents in China*. A Thesis Submitted to Shanghai Jiaotong University in partial fulfillment of the Requirement for the Degree of Master of Engineering. Shanghai: Shanghai Jiaotong University.
- [10] College of Transport & Communications, Shanghai Maritime University. (2013) *Major of Shipping Management*. [Online] Available from: <http://www2.shmtu.edu.cn/cct/otherView.asp?id=46>. [Accessed: 8th December 2013]
- [11] Shanghai Jiaotong University. (2010) *Shanghai Jiaotong University cooperate with Baltic Exchange to Cultivate Talents for Maritime Services Fields*. [Online] Available from: <http://news.sjtu.edu.cn/info/1002/84000.htm>. [Accessed: 12th December 2013]
- [12] Dalian Maritime University. (2013) *Overseas Teachers Start Teaching in Shipping Finance Major*. [Online] Available from: <http://202.118.83.98/dlmu2/html/2013/03-26/4956.html>. [Accessed: 15th December 2013]
- [13] Shanghai Maritime University. (2013) *EMBA of Shipping Finance Established in Shanghai Advanced Institute of International Shipping*. [Online] Available from: <http://www.shmtu.edu.cn/spotlight/da-zao-hang-yun-jin-rong-ren-cai-zhi-ku-zhu-tui-chan-ye-sheng-ji-qiang-li-yin-qing-shang>. [Accessed: 18th December 2013]
- [14] Liu, Z. J. & Wen, Y. Q. (2013) *Analyze on "Some Suggestions for Improving the Quality of Maritime Education by Ministry of Education and Transport"*. Dalian: Press of Dalian Maritime University.