

THE FACTORS AFFECTING THE MET INSTRUCTORS' EFFICIENCY

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The instructors who teach professional courses at maritime education and training institutions play an important role in the process of acquiring new and/or upgrading existing competences of seafarers. Both the instructors' and the seafarers' standards of competence must meet the requirements of the STCW Convention. The implementation of the education system that complies with these requirements is responsibility of each Party of the STCW Convention. If there are discrepancies, the maritime education and training system will not deliver intended learning outcomes, with highly probable negative impact on the motivation of learners and teachers participating in the process. The IMO has identified the problem and supported development of the different IMO Model Courses to help the instructors at MET institutions to deliver the curriculum in accordance with expectations.

The main goal of the research presented in this paper was to identify the current situation and the key factors that influence the learning outcomes in different countries. The research lasted one year, from January 2019 through January 2020. It included 113 MET instructors from 26 countries. All the data were collected by means of a questionnaire.

For the purpose of this paper, the key factors affecting the intended learning outcomes have been divided into two main categories: the factors referring to the MET instructors and those referring to the trainees. The organisational segment (duration, costs of education process, etc), although indirectly influencing the intended learning outcomes, has not been analysed in this paper.

The key factors identified as relevant for instructors' competences are sea service time, and additional training (both professional and educational). The factors referring to the trainees' competencies are their personality and cognitive abilities of a person or a group, motivation and communication skills. The last part of the research deals with opinions of the MET

instructors regarding the usability of the IMO Model Courses as a practical tool in MET processes.

The paper presents the findings of the research but also indicates the most important conclusions and recommendations supported by the findings.

Keywords: STCW, IMO Model Courses, Competences, MET instructors

1. Introduction

The International Unification Standards of Maritime Education and Training (MET) programs is vitally important for the seafarers' knowledge, skills, and competence. Training and assessment requirements for the qualification of instructors and assessors in MET are specified in the STCW Regulation I/6 of Chapter I – General Provisions, and Quality Standards in the STCW Regulation I/8. The mandatory technical standards are contained in Part A of the STCW Code STCW 78/95 [6]. Guidance regarding training, assessment and quality standards is specified in the non-binding Part B of the STCW Code that provides effective suggestions for member states in terms of best compliance with certain requirements. The requirements of the STCW convention are quite general, thus it is on each Party to assess the instructor's competences. The same applies to the choice of the quality standard model.

The Administration of each Party shall decide which model to apply, but should incorporate quality policy, quality management, quality system coverage, quality control, quality assurance processes and periodic external quality evaluation. Quality standard system requirements shall apply to all the stakeholders involved in the implementation and activities of the STCW Convention including MET institutions, administrations, ship operators, assessment of competences, certification, endorsement or revalidation of certificates [3]. In accordance with the principle of autonomy, each higher education institution can choose a quality assurance system suitable to their needs [15]. The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) form a specialised system for standardisation. They collaborate with national bodies in the particular fields of activity and set the standards for institutions [11, 12, 16]. Most MET institutions use a quality standard model according to or related to a certain ISO quality model [14]. Quality assurance in MET consists of the following three elements: 1) the proposed curriculum 2) teaching methodology and assessment and 3) adequate resources [13]. A comprehensive and

proper adoption of IMO Model Courses could help to effectively implement the STCW Convention and support training providers and competent teaching staff in designing and delivering new training courses. International Maritime Organization (IMO) enforced model courses as an aid to instructors and trainers in their work [5, 16, 17]. IMO Model Course 6.09 includes planning and preparation for effective teaching, methods and instructions, and evaluation of the teaching and learning process or responsibility of instructors. Specific IMO Model Courses (1.30, 3.12, 6.10) could help instructors prepare and conduct the official assessment of seafarers' competence [3, 4, 7, 8, 9, 10, 16]. To investigate crucial factors affecting MET instructors and current global requirements for maritime university and training centres, the authors prepared a survey questionnaire entitled "Assessment for adequately qualified instructors in MET institutions".

2. Research Methodology

The authors conducted a survey to determine the current situation and the factors affecting the MET instructors' efficiency within institutions. The data were collected by means of a survey questionnaire designed by the authors. It was based both on literature review and authors' experience and expert opinions. Participation in this study was anonymous and voluntary. Before the final survey, a pilot survey was prepared to avoid response bias. The authors did not offer any incentive since it could result in speed runs of some respondents. All questions within the survey were as neutral as possible to avoid stereotype bias. A survey questionnaire was available at Google Forms, through various on-line channels, social media networks, and in a paper form. It was disseminated to different MET institutions with the aim to compile answers from as many institutions as possible. The questionnaire was available from January 2019 through January 2020. The questionnaire contained a total of 20 questions designed to gain insight into the MET instructors' opinions and attitudes. The respondents for this study were instructors working at MET institutions. The survey questions were demographic, open and closed-ended, simple yes and no/I do not know questions and five-point Likert scale questions. The first 5 questions were demographic to determine the general profile of participants. The other 15 questions (Q1 to Q15) were designed to obtain information on respondents' experience and observation regarding courses, training and the teaching process. To pool opinions relevant for the discussion in terms of gaps occurring within institutional procedures or the reasons for potential problems arising during the training process, the authors based their questions on the practical aspect and the quality method tools.

Most of the academic and non-academic ranks represented in the survey were aged between 35 and 55 (59.3%). Academic ranks were Full Professor, Distinguished Professor, Associate Professor, Assistant Professor, Lecturer and Assistant employed at different Faculties of Maritime Studies or Universities. Non-academic ranks in the maritime training centres were Training instructor in the maritime training centre and Marine training development superintendent working in maritime training centres.

3. Results and Discussion

This section contains the main findings obtained for each question along with the related discussion. The authors presented the results in a group of questions to facilitate the presentation and understanding. Table 1 presents respondents' demographic data.

Table 1. Demographic questions

Questions	Offered answers	Percentage
Age of respondents	<i>24 and younger</i>	0%
	<i>25 – 34</i>	14.2%
	<i>35 – 45</i>	34.5%
	<i>46 – 55</i>	24.8%
	<i>56 and older</i>	26.5%
Academic rank or position	<i>Maritime lecturer</i>	23%
	<i>Full professor</i>	19.5%
	<i>Assistant</i>	16.8%
	<i>Assistant professor</i>	15.9%
	<i>Training instructor</i>	15%
	<i>Distinguished professor</i>	6.2%
	<i>Others*</i>	3.6%
Course trainer or assessor at	<i>Faculty of Maritime Studies</i>	82.3%
	<i>Maritime High School</i>	13.3%
	<i>Maritime Training Centre</i>	30.1%
Certificate of Competency (CoC)	<i>Master</i>	38.9%
	<i>Chief Eng.</i>	11.5%
	<i>Chief Off.</i>	9.7%
	<i>OICNW (Officer in charge of navigation watch) (OICNF)</i>	17.7%
	<i>Other**</i>	11.5%
	<i>No rank***</i>	10.7%

* Relatively small sample of participants (PhD research fellow, Marine training development superintended, Associate Professor) does not significantly change the results of survey.

**Relatively small sample of participants (Electro Technical Officer, Second Engineer, Officer in charge of an engineering watch (OICEW)

***Non response

A total of 113 instructors of different nationalities and ranks working in MET institutions responded to the survey. The nationalities of respondents were the following: Croatian, Turkish, Montenegrin, Panamanian, Singaporean, British, Latvian, Indonesian, Polish, Italian, Russian, Spanish, Japanese, Georgian, Filipino, Swedish, Vietnamese, German, Canadian, Peruvian, Egyptian, Bangladeshi, French, Dutch, Norwegian and Indian. As shown in Table 1, from the total number of participants (26 countries), 81.4% were scientific or academic ranks in MET institutions, 15% were the training instructors in MET and 3.6% were others. The

age distribution of 34.5% of instructors was between 35 and 45. As for employment, 82.3% were employed at the Faculty of Maritime Studies, 30.1% in Maritime training centre and 13.3% in Maritime High school. The capacity in which the holder of a certificate is authorised to serve showed that the majority of respondents held CoC Master Licence.

Respondents sea experience and additional education are presented in Table 2.

Table 2. Sea experience and additional education

Questions	Offered answers	Percentage
Q1: How long have you been holding classes?	<i>Less than a year</i>	1.8%
	<i>1 – 5 years</i>	25.7%
	<i>5 – 10 years</i>	28.3%
	<i>More than 10 years</i>	44.2%
Q2: Do you have any navigational experience?	<i>Yes, more than 10 years</i>	37.2%
	<i>Yes, 5 – 10 years</i>	18.6%
	<i>Yes, 1 – 5 years</i>	21.2%
	<i>Yes, less than 1 year</i>	5.3%
	<i>No</i>	17.7%
Q3: Have you sailed on ships of 3000 GT (3000 kW) or more in last 5 years and how long?	<i>More than 1 year</i>	24.8%
	<i>6 months – 1 year</i>	9.7%
	<i>Less than 6 months</i>	8%
	<i>I have not</i>	57.5%
Q4: Have you received any additional training on other institutions since the day of your employment? How long?	<i>More than 1 year</i>	31%
	<i>6 months – 1 year</i>	7%
	<i>3 – 6 months</i>	8%
	<i>Less than 3 months</i>	23.9%
	<i>No</i>	30.1%
Q5: Have you attended any of the courses for seafarers since the day of your employment?	<i>Yes, more than 5</i>	32.8%
	<i>Yes, 5 courses</i>	5.3%
	<i>Yes, 4 courses</i>	9.7%
	<i>Yes, 3 courses</i>	11.5%
	<i>Yes, 2 courses</i>	10.6%
	<i>Yes, 1 course</i>	5.3%
	<i>No</i>	24.8%

As shown in Table 2, the question *How long have you been holding classes* (Q1) illustrates that 44.2% of respondents have held classes for more than 10 years, 82.3 % of respondents had prior sailing experience, while 42.5% of respondents have had sailing experience in the last 5 years (Q2 and Q3). Responses to the question *Have you received any additional training on other institutions since the day of your employment* (Q4) show that MET institutions tend to send their teaching instructors (69.9%) to other institutions for additional training, while 30.1% do not do that. This corresponds to answers to the question *Have you attended any of the courses for seafarers since the day of your employment* (Q5), where respondents stated that 24.8% of them have never attended any courses since the first day of their employment.

In the questions *Have you noticed any problems during the courses (e.g. attendees disrupt the classes, etc.)* (Q6) and *Can you guess the reasons for that kind of behaviour* (Q7), presented in Figure 1, respondents were asked to tick if they had noticed any problems during their courses in terms of disruptions and to tick the possible reasons for that.

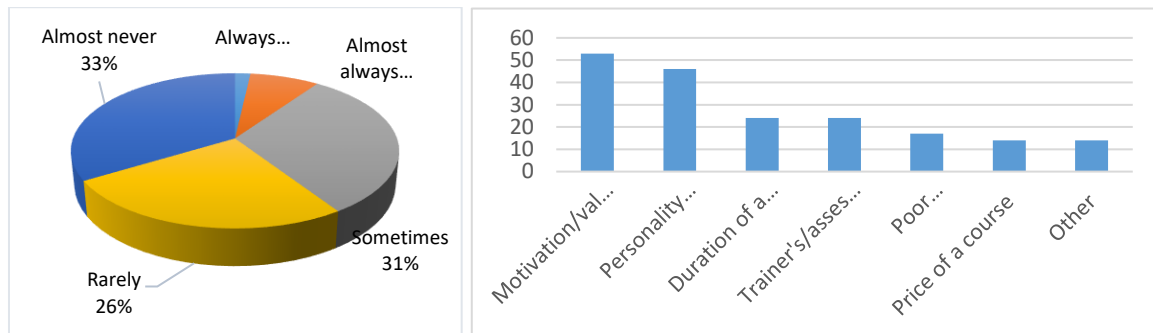


Figure 1. Problem notification (Q6 and Q7) during the courses and the most frequent causes

Figure 1 shows that 67% of maritime instructors have noticed some problems. The main causes of disruptions during courses were first of all motivation, then personality and cognitive abilities, duration of courses, instructor's competence, poor communication skills and the price of courses. It can be proposed that each institution has to look into other factors affecting motivation and try to find the best solution for improvement. These factors can be prejudice, instructor's (in)competence, insufficient education in teaching and practice methods, long duration of the courses and high prices etc. It is well known that all topics covered by the STCW Convention Part A have to be presented to trainees, but the time frame depends on each Party. Part B of the STCW Convention recommends the adequate use of IMO Model Courses with a recommended time line for each topic.

IMO Model Course(s) could serve as a tool and thus assist in the preparation of training courses. The model course programs are neither mandatory nor supposed to be a *blindly followed teaching package* that instructors must abide by. The reason for this lies in the fact that educational systems vary in each country with different cultural background. The following courses include the teaching methods and factors relevant to the efficient teaching process. IMO Course 6.09 includes the planning and learning environment, training aids, teaching activities, subject related planning strategies, teaching and learning evaluation, and assessment techniques (IMO 2017c) [7]. IMO Model Course 6.10 provides necessary knowledge and skills in instruction techniques using simulators. The importance of teaching and evaluating using the approved simulators was specified in the STCW 2010. The simulator

instructor should be a facilitator, dedicated teacher, manager, flexible and adaptable, learning strategist and organiser, motivator and native psychologist [8]. IMO Model Course 1.30 On board assessment and 3.12 Assessment, examination and certification of seafarers could be directly relevant for experienced shore-based instructors with sufficient on board experience and for the MET staff who hold examinations for Certificates of Competency (CoC) and other documents [9, 10, 16].

Responses to question Q9 referring to IMO Model Courses will be presented in the following part. The first question was: *Please tick the courses you have attended* (Figure 2). As analysed and presented in Figure 2, from the total number of 113 respondents, 49 (43.4%) of them never attended any of the courses above. IMO Model Course 6.09 was attended by 54 (47.7%) respondents, while 22 (19.4%) respondents attended only that course. IMO Model Course 6.10 was attended by 36 (31.8%) respondents and 13 (11.5%) respondents attended only 6.09 and 6.10 Courses. Furthermore, IMO Model Course 1.30 was attended by 9 (8%) respondents and IMO Model Course 3.12 by 21 (18.6%) respondents. The second question pertaining to IMO Model courses was the following: *Do you use adequate IMO Model courses when organising and holding training* (Q10). As shown in Table 3, the highest number of respondents (42.5%) use adequate IMO Model Courses when organising and holding training.

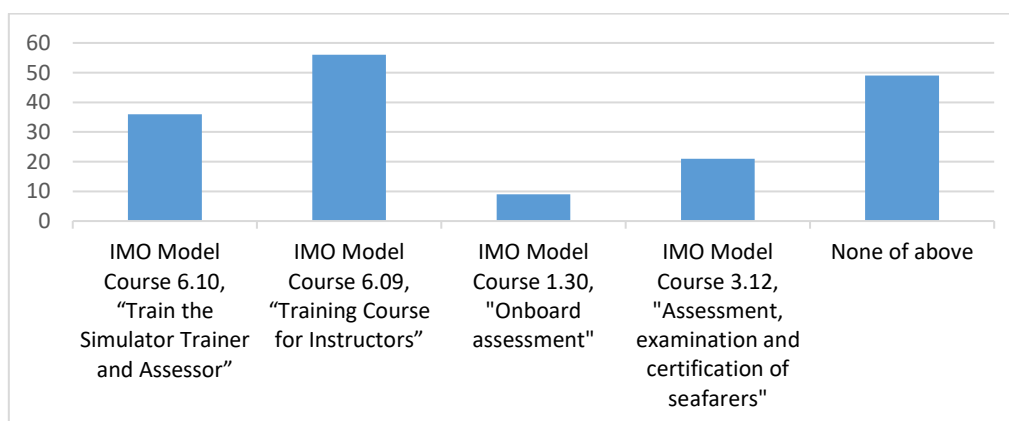


Figure 2. Instructor attendance to IMO Model Courses (Q9)

Table 3. Survey results Q10-Q14

Question	Offered answers	Percentage
Q10: Do you use the adequate IMO Model courses when organising and holding training?	<i>Always</i>	42.5 %
	<i>Often</i>	27.4 %
	<i>Sometimes</i>	21.2 %
	<i>Never</i>	8.8%
Q11: Have you ever used a simulator as a necessary part of the teaching program?	<i>Yes</i>	82.3 %
	<i>No</i>	17.7 %

Q12: Are you satisfied with the available teaching materials you use?	<i>Yes</i>	72.6 %
	<i>No</i>	27.4 %
Q13: Do you think that trainers should be more familiar with the implementation of IMO Model Courses prescribed by the STCW Convention and its annexes?	<i>Yes</i>	81.4 %
	<i>No</i>	18.6 %
Q14a: Do you evaluate your teaching?	<i>Yes</i>	94.7 %
	<i>No</i>	5.3 %

As for the question *Have you ever used simulator as a necessary part of the teaching program* (Q11), 82.3% of respondents use a simulator when teaching. Since only 36 respondents (33% of the total number) attended IMO Model Course 6.10 (pertains to simulator training), this should be introduced as a teaching aid. In their answers to the question *Are you satisfied with the available teaching materials you use* (Q12), respondents stated they were generally satisfied (72.6%) with the teaching materials. For those who were not (24%), it is highly recommended to elaborate on their problems. Responses to the question *Do you think that trainers should be more familiar with the implementation of IMO Model Courses prescribed by the STCW Convention and its annexes* (Q13) suggest that IMO Model Courses should be more straightforward so that those who use them become easily familiar with them. IMO model Courses propose teaching aids, IMO references and Publications to provide a competence based course. Furthermore, IMO Model Courses welcome users to provide feedback to keep the training programme up to date.

To meet STCW Requirements, every Party will propose the standards of competence for instructors. These requirements are defined under Regulation A-I/6 (Training and Assessment), A-I/8 (Quality standards), A-I/12 (Standards governing the use of simulators). Recommended guidance regarding proposed requirements in section B (STCW Code) can be helpful to Parties in the implementation of these requirements.

As for the question *Do you evaluate your teaching* (Q14a), the majority of respondents (94.7%) stated they evaluated their teaching process. In the following question *Please tick the box(es) with method(s) you use for evaluation* (Q14b) most of respondents (74.3%) said they used written questionnaires, followed by oral questionnaires (37.1%), and assessment by supervisor (25.6%). A small percentage of instructors (13.2%) reported they used other means of evaluation. Hence, it is evident that MET instructors use various methods to assess their work and receive useful feedback from their trainees and thus improve the weak points of the teaching process.

In the final question *For the courses prescribed by the STCW Convention (including the course that includes work on a simulator), my institution requires (circle all the answers that refer to your institution (Q15), respondents were asked to tick all requirements that refer to their institution. Results are presented in Figure 3.*

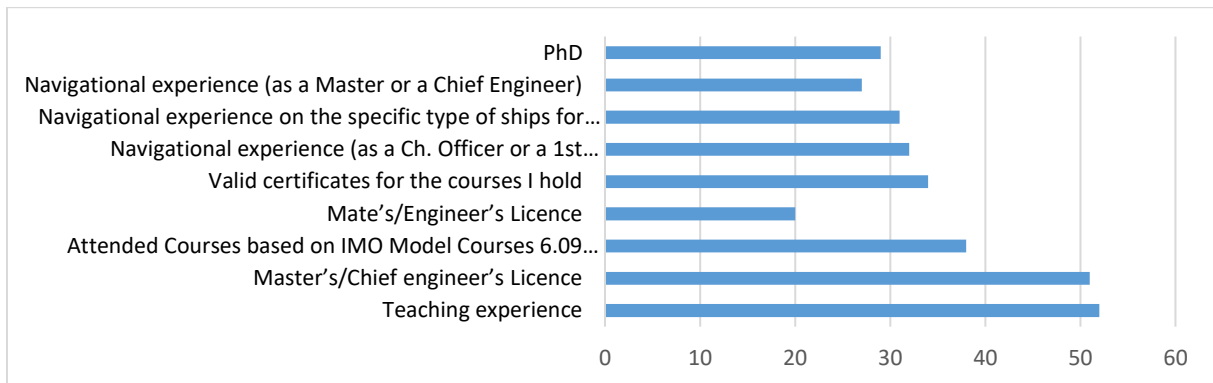


Figure 3. Competences required by MET institutions (Q15)

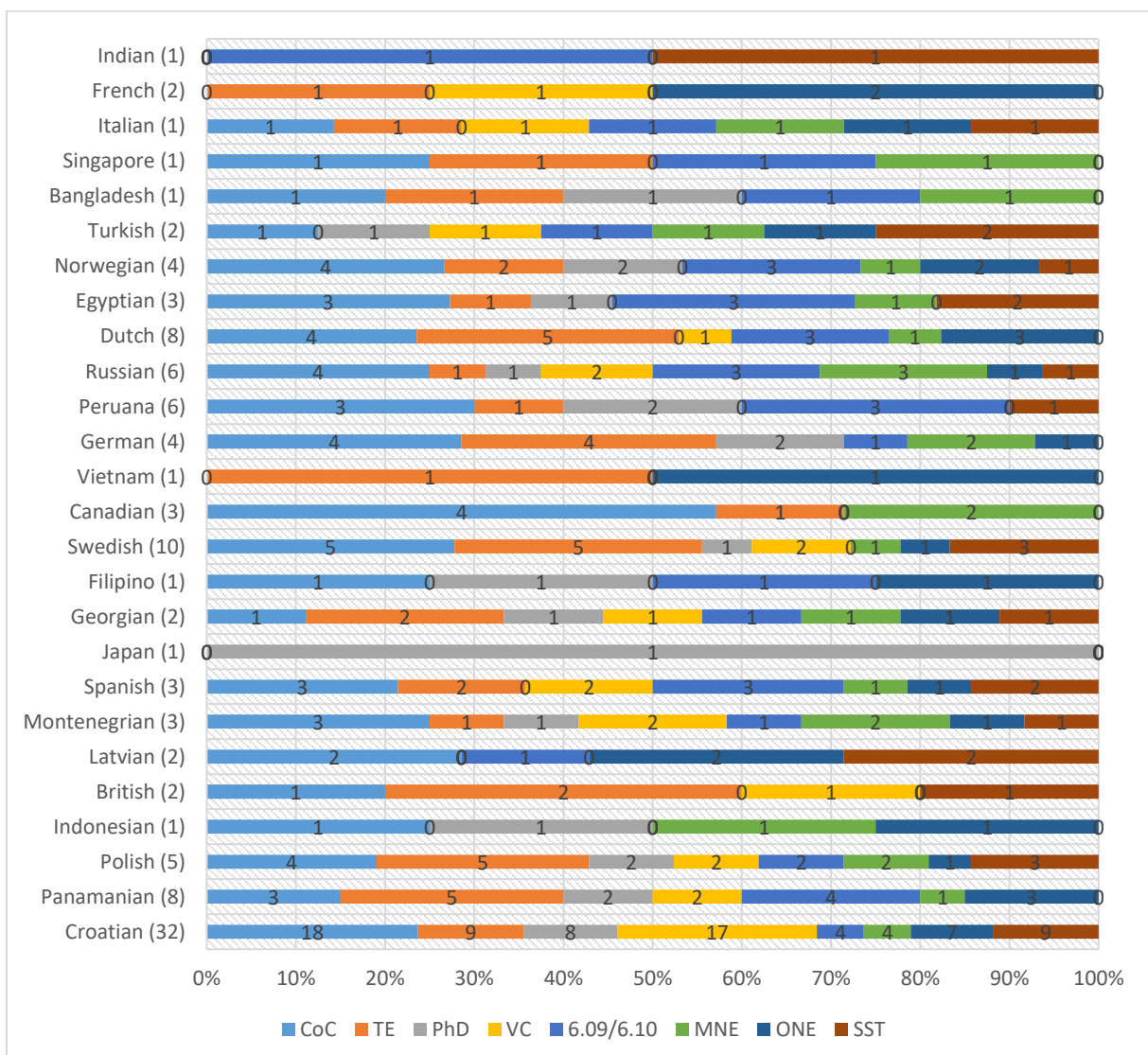


Figure 4. Competences required by Parties according to nationality

Finally, the authors made a thorough analysis (Figure 4) to get more information on the competences required by MET institutions and organised them according to respondents' nationalities. Unfortunately, there is no equal number of respondents from each Party. Numbers next to nationalities represent the number of survey participants, while numbers in bar chart show the number of participants who selected the elements from a list required by their MET institutions.

It is visible from Figure 4 that CoC (Certificate of Competency) is the most important factor, followed by the teaching experience (TE). Many institutions require the proposed IMO Model Courses and valid certificates (VC) for the specific courses. Practical navigation experience (MNE – Master with navigational experience and ONE – Officer with navigational experience) is on the same footing as academic positions. Specific ship type (SST) experience is one of the competences that has been required by some Parties when their instructors delivered specific type courses. From a total of 26 countries included in this study 84.6% require Certificate of Competency (CoC), 65.4% Teaching Experience (TE), 61.5% PhD, 50% Valid certificates for the courses they hold (VC), 73 % IMO Model Courses 6.09 and 6.10 (6.09/6.10), 69.2% Master's/Chief engineer's experience (MNE), 69.2% Mate's/Engineer's experience (ONE) and 50% Navigational experience on the specific type of ships for the courses they hold (SST).

4. Conclusion

This paper presents survey findings and results conducted to investigate the main factors that affect teaching in MET institutions. Efficient teaching in any MET institution requires elimination of all possible factors with a negative influence on the teaching process. Students' or seafarers' motivation, engagement in various tasks, good instructor's interaction with students by implementing reflective teaching practise, or appropriate transformation of instructor's practice could be a key to success.

Some limitations of this research should be noted. Proper and objective assessment of a MET instructor's competence is a sensitive and difficult task not only for Parties to the STCW Convention, but also for any MET institution. It is particularly difficult to draw conclusions without a statistical analysis that would determine the correlations between individual responses and the demographic profile of respondents and/or their competencies.

Research results point to the importance of IMO Model courses in the instructors' education, especially in terms of competence requirements presented in this research and prescribed by the majority of Parties. It is evident that STCW Parties mostly require CoC, IMO Model Courses 6.09 and 6.10, and experience on board as a Master or a Chief Engineer and/or deck or engine officer. An objective assessment of the instructor's competence can only be obtained if the quality standards system provided for in the STCW Convention is implemented in the best possible way. Factors affecting the process of knowledge transfer and the acquisition of new skills cannot be generalised as they are diversified. However, the authors suggest that those who do not have teaching experience attend courses that help acquire new knowledge regarding teaching and effective group work.

Our next step in further research shall be data analysis using adequate statistical software for descriptive statistics and Chi-square test. The research will focus on the correlations among specific groups of respondents and among specific questions.

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