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Strategies for Engaging Maritime Students in Case Study-Based Learning

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Abstract: This paper provides insight into an interdisciplinary methodology developed for maritime students to engage them in the learning process, considering that learning through a real professional experience provided by case studies brings along more thorough results. As per the Preamble of the Fifth Amendment of the IAMU Basic Agreement, human resources are the critical element in the shipping industry. The paper addresses the manifold aspects of case studies utilized by MET institutions in the teaching process with a beneficial effect on the learning outcomes. The case-based methodology helps students understand the most relevant facets of the maritime profession and activities on board ships alongside the diverse equipment functionality, maintenance, components and failures thereof. The authors use case studies to motivate students and stimulate their involvement, to help them learn from one another while encouraging them to ask and answer questions and develop maritime professional knowledge and skills.
Maritime case studies analyse real-life events that occurred on board or during the ship-to-shore communication process. Depending on the academic subject and considering the IMO model courses, case studies are used as teaching accessories to develop hard skills and/or soft skills for problem–solving, and as such they often focus on external factors, situational context and circumstances.

Keywords: case study; maritime education and training (MET); global maritime professionals; maritime safety

1. Introduction

As recognized in the Preamble of the Fifth Amendment of the IAMU Basic Agreement [1], human resources are the critical element in the shipping industry. In order to support the quality education of global maritime professionals, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) with its amendments encourages the maritime education and training (MET) instructors to constantly upgrade their teaching skills and methods and to keep pace with the trends in the maritime industry. This paper provides insight into an interdisciplinary methodology developed for maritime students in order to engage them in the learning process, taking into account that learning integration through a real professional experience provided by case studies brings along more thorough results.

The paper addresses the manifold aspects of case studies drawn upon by MET institutions in the teaching process with a beneficial effect on the learning outcomes. The case-based methodology helps students understand the most relevant facets of the maritime profession and the pertaining activities on board ships along with the diverse equipment functionality, maintenance, components and failures thereof. The learning objectives of a course are the starting point in the compilation of a case study methodology meant to create a productive learning experience. The authors use case studies to motivate students and stimulate their involvement, to have them learn from each other while encouraging them to ask and answer questions and to help students develop maritime professional knowledge and skills.

Case-based teaching texts and materials are depictions of real-life events. A good case study is *"…the vehicle by which a chunk of reality is brought into the classroom to be worked over by the class and the*

instructor. A good case keeps the class discussion grounded upon some of the stubborn facts that must be faced in real life situations" (Lawrence, 1981). Maritime case studies present and analyse events that took place either on board or during the ship-to-shore communication process. Depending on the academic subject and its objectives and at the same time considering the IMO model courses, case studies are used as a valuable teaching accessory to develop hard skills and/or soft skills for problem–solving, and for this reason they often focus on the external factors, the situational context and circumstances.

2. Maritime education and training

A lack of well-trained human resources on the maritime labor market is cause for the expedited advancement of maritime professionals. This is the primary reason why the time required for cadets to acquire the necessary seafaring skills is beginning to decrease. The Baltic and International Maritime Council (BIMCO) and International Chamber of Shipping (ICS) report for 2021 shows that the global merchant fleet will keep expanding and that the expected demand for seafarers, as well as the trend toward a general absence of seafaring officers, are likely to continue. The world's merchant fleet will require an additional 18,000 officers annually until 2026, according to estimates. If the educational program is effective as well as suitable, maritime education and training, often referred to as MET, can be considered a crucial line of defense in the event of an accident. Because the STCW convention is the benchmark for education and training, it naturally plays an important part in the effort to establish a culture of safety. MET is responsible for attending to the training requirements of the industry as part of its mission. A more comprehensive approach to education would lead to the empowerment of seafarers by making them more equipped to meet the challenges of modern shipping and also preparing them for employment in the shore-based marine industry. In addition, this form of education would make it easier for them to take on leadership responsibilities.

The level of education received by seafarers is unique among professional educations due to the fact that the whole global economy, and the maritime sector in particular, as well as the protection of people and the environment, are dependent on it. Because of the importance of the maritime industry to the global economy and the fact that about 90% of all international trade is conducted by merchant ships, the standard of education in this field is a key factor in determining the state of the world economy. Hence, strong training requirements, together with current and cutting-edge technological advancements, are essential components of a dependable and risk-free shipping sector. The rules of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as revised in 1995, and later on in 2010, serve as the foundation of the educational process for marine professionals and were established to guarantee that seafarers are held to a certain level of competency. During an investigation into the factors that lead to human mistakes, it was discovered that an inadequate level of education, training, and practical experience on the part of human resources was responsible for more than 40% of all cases (Sánchez-Beaskoetxea, 2021). Consequently, the International Maritime Organization (IMO) established a Sub-Committee to deal with the Human Element, Training, and Watchkeeping (HTW) issue, therefore designating maritime education and training as one of the primary goals of its operations.

Education and training of a high standard in the maritime business are essential to the industry's continued growth, both at sea and ashore. Only in this way can the safety and effectiveness of navigation be maintained. The characteristics and complexities of the technical processes involved in the movement of products by sea do, in fact, call for the incorporation of contemporary approaches to simulator training into the educational process. In the maritime education and training, where students frequently have to deal with abstract notions that do not have any objective representation, the combination of all of these factors provides a substantial incentive for employing novel pedagogical strategies when training in the maritime industry. During the classical education process, maritime cadets are provided with ready-made generic information in the form of textbooks, lectures, and specialized manuals. On the other hand, it is safe to say that such training does not necessarily provide the most desirable outcomes. Cadets are coerced into creating mental representations of abstract ideas and principles. A great deal of the time, such ideas incorporate connections and ideas that are nebulous or elusive. In the end, it is not always the case that the cadet has an exact and clear knowledge of the training content. Traditional methods of instruction make it difficult to circumvent errors, and that in turn makes it difficult to completely comprehend and apply the appropriate scientific models.

3. The case study method in MET

3.1. The case study method

The case study is a teaching strategy that involves presenting trainees with descriptive scenarios that encourage them to make decisions. The objective of using the case approach in training is to encourage trainees to apply what they have learned and come up with new ways to manage a situation or find a solution to a problem. The accent lies more on the technique the student uses rather than on the solution. As a teaching tool the case study approach can be used to promote decision making abilities, improve collaboration, foster better communication and interpersonal skills as well as boost the critical thinking abilities of students.

In spite of the fact that the phrases "case study" and "case method" are sometimes interchanged with one another, these two research approaches are not the same. A case study is an account about a circumstance or occurrence that incorporates a problem or issue, and the situation is almost always based on real life. Typically, the case study will include not only information about the issue at hand, but also details regarding the approach adopted to deal with the dilemma, as well as the outcomes of the measures made to resolve the matter. The case method also involves presenting a predicament or a problem area, but these do not have to be based on real-life situations. However, it does not explain the learners "What was done", and neither does it supply any remedies at all. The learners are responsible for thinking of potential solutions that might be applicable to the case facts. The latter method engages learners in a more meaningful way and compels them to engage in proactive problem solving, in contrast to the former method, which treats the analysis as more of a post factum kind of exercise.

3.2. Preparing for a case study discussion

The case study method typically consists of three stages, which are individual preparation, small group discussion, and big group or class discussion. These stages are utilized regardless of the subject matter that is being studied. Although the instructor and the student begin with the identical information at each of these stages, their roles could not be more different from one another.

Stages	**Trainer**	**Trainees**
Before class	Elects and assigns case	Receive case and assignment
	Prepares for class	Prepare individually
During class	Manages the class in the reading activity and familiarization with the case	Raise questions regarding readings
	Leads case discussion	Participate in discussion
After class	Records, evaluates and grades student participation	Compare personal analysis with their colleagues' analysis
	Evaluates materials and updates teaching notes	Review class discussion for major concepts learned

Figure 1. Teacher's and students' roles in case study-based learning (after Leenders, 2010)

3.2. The case study method in MET

Over the course of the last few decades, the marine industry all over the world has come under a growing amount of stress as a direct consequence of a number of changes that have been made to the environmental regulations, the digitalization of the sector, advancements in technology, and the increasing internationalization of the business. These developments have all taken place in direct correlation with one another. In many shipping businesses, marine professionals need to carry out many more tasks than merely standard duties and are rather involved in non-traditional ones such as strategic thinking and telecommunications and information technology initiatives. This is the case because of the growing importance of information and communications technology in the shipping industry.

Being a successful seafarer requires more than simply adhering to the rules and regulations that are in place. Because it involves more creative and imaginative thinking, it frequently necessitates the application of professional judgment when there is no technological solution accessible. This is due to the fact that it requires more creative and imaginative thinking. The necessity for graduates of maritime programs to develop soft skills such as communication, teamwork, critical thinking and problem solving, ethics, and so on has been identified as being of fundamental importance by international maritime bodies. These soft skills can be seen of as transferable skills that can be used in a variety of contexts. A significant number of maritime educational institutions have identified a gap in the ways in which they teach their students to provide graduates with the broad soft skills demanded by the sector. Therefore, in this context, MET should focus on providing the appropriate educational and training material in order to bridge this gap and better prepare students for their professional life in the shipping industry.

The shipping sector should work together with the higher institutions involved in maritime education and training to help them identify the case studies that should be used. These should therefore form cohesive educational material that is aimed at tackling existing soft skill gaps while additionally offering teachers helpful content with respect to the subject matter and the teaching methods. This integrated educational material should be geared to address current soft skill gaps.

4. Strategies for engaging maritime students in case study-based learning

4.1. Preparation for classroom delivery

In order to engage students in this type of teaching and learning method, teachers need to not lose sight of the main objectives of the case study method, i.e., to engage students in authentic application of knowledge, to help them assimilate further knowledge about procedures and strategies, to promote collaboration and to develop their critical thinking and problem solving / decision-making skills.

It is recommended to have students fill out cards listing their educational backgrounds, employment histories, and hobbies, depending on the teaching setting (whether it be during the academic year with regular classes of students or on an irregular basis during a spring or summer school course). These cards should include information on the students' interests. Before the beginning of class, teachers should go over these flashcards and compile a list of the four or five individuals in each group who are most likely to offer anything insightful to the conversation. In the second scenario, it is essential for the students to develop a sense of familiarity and confidence with one another. If students do not feel that the classroom is a secure environment, then they will not participate in the conversation. Assist them in becoming familiar with one another by providing name tags or cards for their workstations.Have a conversation with the students about the process of case studies and the appropriateness of using them for the development of soft skills. Make clear the connection between the learning objective served by case studies and the expected level of participation on the part of students.

In achieving said objectives, a good strategy is first of all to create a positive atmosphere by setting out ground rules for participation. It is also essential to underline that the study will be a a collaborative endeavor, that no one will be criticized for bringing naive questions or uncertainties, and that everyone should actively collaborate with the other members of the team on the study. In the absence of a distinct sense that they are free to explore assumptions, students have a tendency to keep quiet until they have the impression that the correct response has been established.

Instead of being the central figure and feeding students the most appropriate answer, the teacher should ask question as to guide students through the activities and elicit answers. For the case study method to be successful, one must be familiar with their students and link the material with the people who are there, e.g. *Who has already been at sea (as a cadet)? Who has worked in the maritime field?* or questions like:

- *If you could talk about a time when you had to lead your team through a challenging scenario, what was it like?*
- *When you have a number of different due dates to meet, what method do you use to prioritize your work?*
- *Describe an instance in which you were required to make a judgment without the oversight of managerial personnel. What strategy did you use to approach this matter, and with whom else did you discuss it?*
- *When was the last time, if ever, that you attempted to do something without any prior experience?*

- *Describe the biggest professional setback you've ever had. What kind of lessons did you take away from this experience?*

To this end, another successful strategy is to:

- separate the students in the class into groups according to several characteristics, such as whether they are outgoing persons or more reserved, how well they speak English if the case study method is used in Maritime English classes, or how much sailing experience they have. Additionally, it is essential for students to be familiar with and trustworthy of one another. Students will be reluctant to participate in the conversation if they don't think the classroom is a secure environment for them.
- briefly present the case, provide some instructions for how to approach it, and clarify how students are expected to think about the case.
- provide an outline of the process that students are to follow when evaluating the case. If the teacher would like students to ignore or concentrate on specific facts, he or she should express that as well; alternatively, he / she might assign certain soft skills to be considered by different groups of students, and then, at a later time, exchange points of view.
- advise the students to watch and listen closely, and to concentrate on the reactions of the characters engaged in the case that is being depicted.
- give the students instructions to take notes.
- give students enough time to think about the case. If the case is long, it may be assigned as homework with a set of questions for students to consider.

4.2. Evaluation

How will the teacher know if the learning objectives were met? After the study case, teachers analyze exactly what the students have acquired and determine whether or not there are methods to make it more effective. Throughout the duration of the class, it is important to evaluate whether or not the students are independently achieving meaningful progress in the subject matter. Are they putting into practice what they discovered in the initial discussion? Students improve their ability to communicate both orally and in writing, as well as their capacity to work effectively in groups and collaborate, while using the case study method. This is why teachers need to pay attention to how the students behave during the discussion in order to determine how they apply their hard and soft skills and which of their skills are most likely to be demonstrated during the exercise. There are a variety of different tasks that can be given out in class when the case study method is utilized. These assignments are determined by the academic subject that is being studied.

After participating in an experiential learning activity, participants need to engage in debriefing and consolidation activities. If the students have just been through an emotional experience that was anywhere from mild to extreme, it is imperative that the instructor give them some time to move out of that emotional framework; otherwise, they risk being overly absorbed and carried away with the activity. When doing a debriefing, it is important to elicit from the individual learner or the learner group their ideas, emotions, and observations, as well as anything else the trainer may deem necessary. The knowledge that was debriefed needs to be written down and made public so that it can be related to learning in actual life circumstances.

Debriefing questions are a final important part of the case study strategy. The teacher may alternate between different points of view by asking questions such as, *Now that we've seen it from character A's standpoint, what's happening here from character's B's standpoint?* What kind of evidence could B present to back up their claim? To what extent do the two positions interact with one another? Also, the debriefing can go on by changing the level of abstraction: if the response to the issue that was asked is "It's just a bad situation for her," using quotations can be helpful. When character A says "_____," what does B assume he/she means? The teacher can look for more specific explanations to the question, *Why does that character in the case study have such a viewpoint?* or change the time frame to include more than just *what's next?* but also to the question of how a different outcome may have been achieved given the circumstances by inquiring about students' input by questions such as *What steps could have been taken earlier to head off this disagreement and ensure that it led to a positive result?*

5. Conclusions

Teachers and academicians have also developed with the case study method, doing so while thereby maintaining an eye on the broad benefits that the case study may provide as a learning tool. The manner in which it is applied, the level at which it is used, the additional materials that are used with it, and the activities that come before or after the case analysis can all be considered new developments.

Teachers are generally fully conscious of there is no one definite way to ensure that their classes are beneficial to their students. Because the trainer has an awareness of the many approaches he employs in a variety of settings, he is able to influence trainees to participate and learn in a manner that is both more fascinating and unique. However, even before a teacher makes the decision to use an advanced training technique, he or she should first consider the following questions:

- Is there a sufficient amount of time? How many hours does it take the teacher to prepare it before the class, and how long does it take to use it? During the course of the training period, are the teacher and participants allotted that amount of time?
- Does the method of instruction require the teacher to have certain specialized abilities? Does the teacher have these skills at their disposal?
- Is it necessary for the students to already have a specific set of background knowledge or abilities in order to use this method?
- Do students have sufficient motivation to engage themselves in such complex methods and put forth the extra time and effort required to participate?
- As they are more loosely organized than other methods, case studies demand a significantly more mature level of participation from their participants. Do students have such an advanced level of maturity?
- Does the method appear to be capable of meeting the requirements of the program? Is the approach appropriate for the goals to be achieved?
- Is the approach suitable for the number of trainees or students who will be participating?

As for marine students, also the integration of soft skills is something that people employed by the maritime industry need to recognize as important. Because of this, consequently, the working environment onboard will be strengthened, which will lead to better efficiency.

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