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Communication Skills in Engineering Higher Education with a Focus on Maritime English in MET

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Abstract. In order to prepare graduates to take on responsibility and leadership-oriented positions early in their careers, engineering curricula traditionally focus primarily on technical abilities. The selection of engineering science courses that make up most of these programs of study is consistently preparing graduates for the technical aspects of their field of study. As employers tend to hire graduates who do not require additional training, the eligibility of job candidates on the labour market is also strongly reliant on the range of soft skills attained such as foreign language competence, communication skills, appropriate mindset in teamwork, stress management, etc. Most universities throughout the world feature soft skill courses in their curricula, which are primarily targeted at building professional qualities. In the marine industry, the STCW convention's Chapter III/I code specifies standards for a marine engineer's operating competence. To be deemed competent, officers in command of an engineer's watch in a manned engine room or a designated duty engineer in a periodically unmanned engine room must be qualified to "use English in written and oral form". Therefore, instructors should focus on teaching specific terminology and communication skills as required by IMO standards and the international shipping industry in order to prepare high-quality seafarers in terms of maritime English. This paper aims to identify a method of incorporating communication skills and language proficiency into the engineering curriculum with a focus on Maritime English in MET.

Keywords: communication skills, engineering education, maritime education and training, STCW, MET, transversal skills

1. Introduction

In order to prepare graduates to take on responsibility, leadership-oriented positions early in their careers, engineering curricula traditionally focus primarily on technical abilities. The selection of engineering science courses that make up the majority of these programs of study is acknowledged as consistently preparing graduates for the technical aspects of their field of study in the pertaining curriculum. Increasing technological advancement along with the dependency on regulatory guidelines, have indicated some pressure to marginalize soft skills such as communication skills, foreign language competence, appropriate mindset toward team members, organization skills, stress management, and personal development, which, ironically, experienced engineering managers strive for in their hiring

process. Given that the eligibility of job candidates on the labour market is strongly reliant on the range of soft skills attained, as employers tend hiring graduates who do not require additional training in this area. These skills need to be regarded as essential by both scientific communities and professional companies. Fortunately, the problems posed by globalization and the ensuing expectations placed on tertiary education have reduced the relevance of exclusively technical academic excellence and, as a result, re-evaluated the importance of soft skills, raising them to an upper position in the curriculum.

First and foremost, transversal skills encompass characteristics generally referred to as "soft skills." These skills refer to an individual's capacity to engage with other people, such as effectively working in teams, effectively communicating, and effectively solving problems [1]. One of the most important sets of abilities that potential employers seek in prospective employees is a collection of competencies known as soft skills. These skills can help promote flexibility and a positive attitude, particularly in the context of collaborative teamwork, for example. For instance, listening and interacting with others are frequently at the forefront of the list of preference components on which employers place a growing emphasis. This suggests that "new graduates who demonstrate soft-skills (...) will be more competitive in the market place than those who do not" [2] (p. 695).

So, what is the best way to incorporate the humanities and social sciences into the engineering curriculum? At what level? How do students interpret the work they did in these disciplines to get their degrees? Do they acknowledge the importance of the abilities and knowledge acquired in their supplementary courses for the workforce? Do any of them have an interest in getting more exposure to the social sciences and humanities? What further approaches might be used to make supplemental studies more valuable for engineering students? Furthermore, how effective are these courses in developing soft skills like communication? Most universities throughout the world feature soft skill modules in their school curricula, which are primarily targeted at building professional qualities. Courses often include issues such as document writing (business letters, memos, resumes etc.), preparation for job interviews, taking part in meetings, delivering presentations, and so on. The rising market competition and the faster design/produce/sell cycle have inflicted a higher rhythm and raised psychological stress on both employers and employees.

The situation is no different as far as maritime education and training (MET) is regarded. Despite the fact that marine engineers make over half of all seafarers on board ships, Standard English guidelines, such as SMCP for navigation officers, meant to minimize communication barriers, are not provided for marine engineers. According to IMO norms, marine engineers must be fluent in English. The STCW convention's Chapter III/I code specifies standards for a marine engineer's operating competence. To be deemed competent, officers in command of an engineer's watch in a manned engine room or a designated duty engineer in a periodically unmanned engine room must be qualified to "use English in written and oral form". To be competent, marine engineers must have appropriate knowledge, comprehension, and fluency in English in order to be able to use engineering manuals in written form and conduct engineering activities verbally. To minimize accidents resulting from miscommunication, the maritime sector has regulations regarding both onboard and outboard communication. For example, most oil tankers are chartered from shipping companies unaffiliated with the oil industry. Vetting inspections are regularly conducted, and one of the tasks of such inspections is to assess crew members' knowledge of maritime English. As a result, it appears that all incidents caused by lack of communication or linguistic misunderstandings show that the English language is not adequately taught to marine cadets. Therefore, instructors should focus on teaching specific terminology and communication skills as required by IMO standards and the international shipping industry in order to prepare high-quality seafarers in terms of maritime English.

This paper aims to identify a method of incorporating communication skills and language proficiency into the engineering curriculum with a focus on Maritime English in MET.

2. Communication Skills in Marine Engineering Higher Education

Foreign language classes in higher education should provide cultural and intercultural elements, in addition to the acquisition of language skills in specialized fields, to enhance the education of future graduates, imbuing them with attitudes and aspirations of respect and self-respect, democratic and humanitarian ideas, and lifelong learning. Language courses for non-philological students contribute significantly to awareness and respect for various cultures, as well as favourable positioning and adaptability to cultural diversity. The objective reality of our times, characterized by diversity, by the coexistence of identities with all that they share and differ, necessitates a reshaping towards understanding, a shift in perspective, one that accepts, values, and experiences cultural differences as a source of growth and qualitative contribution rather than conflict, in accordance with the Council of Europe's desideratum of "unity in diversity." While avoiding the risks associated with unequal cultural changes or, worse, the tendency for cultures to fragment, the teacher must adopt a teaching approach that views cultural differences as an advantage, a potential source of enrichment for each student enrolled in a foreign language course, rather than a flaw that causes anxiety and complexes.

Because crew members on board ships are from various nations, they are likely to have communication issues. A strong education and training in cross-cultural differences, on the other hand, can assist crew members achieve a common basis of understanding, assuring safer and more successful ships. Communication concerns between ship's crew members from diverse nations must not be overlooked; addressing and analysing problems that may occur due to cross-cultural differences are key components to consider in any education program. Because they instruct seafarers from various cultures, maritime instructors and institutes can aid in this education and training. Such an education may be highly beneficial in establishing improved communication skills among crew members from various cultures and ethnicities. It makes sense to emphasize that maritime educators should be well-versed in differences between cultures.

This is why the pertaining syllabus should be adapted as to:
– emphasize the significance of the communicative dimensions of competency in completing operations safely and event-free;
– describe the various communication-related soft skills and the conduct patterns that go with them;
– determine which behaviours should be embraced and which should be avoided;
– define the importance of having a diverse set of soft skills and behaviours in a group of people, which when combined may boost performance.

Furthermore, it should provide a simple and adaptable tool for assessing communication skills as well as technical proficiency during routine vessel operations.

A proper syllabus should also explain why, how, when, where, and by whom this evaluation can be performed. All companies can use the system and incorporate it into their existing assessment or evaluation processes. It may also be used to aid in the promotion and recruitment procedures if correctly implemented.

The main goal is to build and strengthen future officers' technical abilities and communication skills to benefit both the individual and the crew members on board. The examination of conversational skills should be viewed as a chance to enhance everyone's behaviour. Rather than being just an additional test that officers must pass, the related evaluation would be part of a continual development process. It varies from technical competence systems such as those included in the STCW Convention in this regard. Companies would benefit from incorporating their assessors, who may include maritime and technical superintendents, in the implementation of this system, as well as educating assessors on behavioural skills and assessment follow-up. This, in turn, will bring onshore workers and sailors closer together and aid in the improvement of a safety culture. Companies who fully apply this approach will improve operational efficiency and minimize the number of issues. This technology is novel and intends to make a significant difference in maritime safety management. As a result, the function of the evaluator is critical, and specialized training is advised.

As long as the majority of scientists consider communication skills and creative thinking to be fundamental components of soft skills, engineering foreign language education can allow instructors to enhance students' soft skills through the use of communicative and engaging tasks, which can be

incorporated into an effective method of teaching a foreign language. The productive approach is the method of teaching foreign languages that employs a variety of participatory instructional technologies and online instructional materials and aims to improve not only the foreign language communication abilities of engineering students, but also their social and personal qualities, which are also facets of soft skills.

2.1. Techniques aimed at developing communication skills of future marine engineers

The European Union's emphasis on qualifications and abilities has the potential to encourage the development of skills necessary for a knowing society, as well as the learning of foreign languages, innovative thinking, and other skills that enhance the educational component [3]. These goals tackle the necessity of being able to react and adjust effectively to the shifting landscape and increasing demands that come with globalization. The subject areas related to education and transversal skills promote the significance of skills that many of us generally equate with the umbrella term "soft skills" and aim to match the needs of today's job market and globalization while also contributing to adaptability, self-determination, and proactive behavior in other aspects of lifelong learning. In other words, the topics of education and transversal skills emphasize the importance of skills that are traditionally associated with the concept of soft skills.

Different authors' definitions of the concept "soft skills" are interpreted differently, and this must be taken into account. Nonetheless, all definitions are partially interconnected, and some of them overlap. Soft skills are associated with the communicative abilities required for success in professional activities. There are numerous models of soft skills available today. However, they share similarities as well as differences. Thus, many researchers include communicative skills, decision-making skills, and time management skills as required elements of the models.

How can teachers choose which teaching and learning approaches will be most effective in conveying the many subject areas covered by the course of study? The conventional approach to education holds that lectures are the most effective means of communicating any given topic to students. Class discussions, PowerPoint presentations, and even multimedia presentations are included in some of the more advanced education programs, and some of these programs also include these educational approaches.

Writing assignments for engineers should include a scenario or an issue to solve that will provide a challenge for them and push them to produce new ideas or innovate old ones using their creativity and other soft skills. In addition, a written assignment can be completed in an online format due to the fact that information and communication technologies can now ease not only the process of writing but also the development of students' technological and numeracy abilities as well as the evaluation of students' work by teachers, therefore assisting teachers in adapting to new educational innovations.

Other techniques for developing interpersonal skills in teaching English to students at technical higher education institutions are:
- the independent study of the required information (reading books, articles, and blogs) and participation in webinars;
- obtaining feedback from peers, instructors, and employers regarding the effectiveness of the behaviour while developing a particular skill;
- the investigation of specific situations and the provision of optimal solutions, e.g. the use of case studies to develop communication skills;
- instruction through expansion of subject lines based on dichotomous thematic oppositions, i.e., the introduction in the study of required information with the aid of a brief topic, narrative, accompanied by an analysis of its emotional and personal significance;
In collaborative learning, the methods that are applied cover not only lectures and conversations in teams but also role play, simulations, structured exercises and instruments, case studies in an array of forms, and other similar activities and formats. Participative learning incorporates a wide variety of additional activities, some of which are field trips, practice sessions, competitions, self-study, video

review, and others. All of these activities are designed to maximize the learning process. The majority of courses aim to accomplish multiple goals at once, including the improvement of knowledge and abilities as well as a change of mindset. The successful accomplishment of this goal will be dependent on selecting the technique that is most suitable for each of its components as a result of finding a helpful framework for understanding which learning approaches are most suited for developing knowledge, which ones are best suited for raising awareness, and which ones are best suited for increasing competence.

2.2. The teacher's role

When conducting a class that makes use of organized experiences as the foundation for the learning cycle, the teacher is responsible for a number of distinct responsibilities:

- Deciding upon the most suitable approach: it is helpful to use the learner group's personal knowledge whenever there is a chance that the group of students will have sufficient insights among themselves on the given topic, and when there is also a possibility that the students will not feel hesitant to share their knowledge. A simulation, for example, may be employed if the reactions or feelings that need to be generated are ones that are inherent in a complex interpersonal scenario. On the other hand, games could also be employed if the context is simpler.
- Preparation: After deciding on the correct approach, such as a roleplay, a case study, or a different strategy, the teacher is responsible for keeping the content ready to be applied. In the case of images, this might involve selecting the suitable pictures; in the case of a role play, this might mean determining the tale or theme for the script; in the case of a case study, this could involve determining the appropriate case and commissioning copies to be made; and so on.
- A briefing on the project: The class is given an explanation of the assignment at hand, which is the material that it is expected to share, observe, discuss, ponder, and analyze. In addition, the necessary steps for recording and reporting are outlined in detail, and time constraints are imposed.
  Dividing the class into groups: for the purpose of more productively sharing and analyzing information, it could be essential to break the larger class up into several smaller ones according to criteria such as experience at sea, fluency in English, confident vs. introvert, etc.
- The teacher should describe in detail the process that they want students to follow in order to evaluate the material. they need to make it clear to the students whether to ignore specific details or concentrate on other facts. (Various soft skills might even be assigned to be addressed by different groups of students, and then at a later time, the various points of view may be compare and debated upon).
- Keeping Control: Although this may appear authoritarian, the teacher needs to keep some degree of control over processes like simulations, role plays, and games in order for effective learning to take place. This is necessary in order for each student to be able to acquire new information.
- Monitoring the discussion Teachers should keep a constant check on the class while the smaller groups are having their discussions. They should be looking for things as simple as whether or not order is kept, as well as for more essential things like whether or not the discourse is understandable, whether or not the talks are on the right track, etc.
- Debriefing is the process of eliciting from individuals or groups the general idea and essence of what they observed or felt.
- Summing up. The numerous reports and debriefs should be reviewed in front of the group, and different themes and threads should be pointed out in order to place the information into a framework that is understandable. It is possible that the teacher will need to add something of their own accord on many occasions.

- Providing input: it is not compulsory to solely summarize on the basis of the inputs acquired from the students themselves. It is the responsibility of the teacher to offer the students the necessary information, some of which they may not know or be aware of.

3. Conclusions

The value of learning English in a variety of contexts, particularly in the professional world, has been amply demonstrated in recent decades. Learning English improves one's chances of securing a good job in any local or international company, regardless of the company's location. Because it is also the language of communication, and because it is used both in the media and the internet, learning English is crucial not just for a job but also for socializing and leisure activities.

It is necessary for young people and those who will soon enter the workforce to have a strong command and comprehension of the English language, as it is the language of choice in virtually every industry and even more so in the maritime field where it is basically the only internationally recognized language of professional use. From their point of view, the significant role of transversal skills in the successful integration of recently graduated marine engineering students into the labor market prompts us to believe that the acquisition of soft skills, particularly in a labor market that is affected by changes in social, economic, technological, and political systems, is becoming an increasingly essential skill. Higher education institutions in engineering face a significant obstacle in the form of a crucial challenge when it comes to extending the process of acquiring transversal competencies to daily activities. This will include the improvement of the life capabilities of new graduates, contribute to their socially responsible behaviour, and effectively prepare them to deal actively with the challenges that are currently being faced by society and the environment. Possessing a strong command of the English language allows one to pursue possibilities in any aspect of one's life, regardless of the person's background. It could be in any particular line of work, in any social or political setting, or in any opportunity that requires strong interpersonal abilities. If you have the necessary communication skills, you will likely have a greater chance of having favourable prospects. This is especially true if you have obtained all of the necessary competencies.

Because the English language is widely used in shipping companies all over the world, it plays a very important role in the accomplishment of any worldwide endeavours. In light of the aforementioned, higher education institutions act as academic environments for students by providing them with comprehensive knowledge and the necessary communication skills that they depend on at that point in their professional development. Teachers are responsible both for determining whether students struggle with language and for putting the fundamental skills into practice at the same time. It has been demonstrated that students can learn second language skills more effectively and profitably when they engage in activities that are performed on a regular basis. The current rules established by the International Maritime Organization (IMO) Standards of Training, Certification and Watchkeeping (STCW Manila; IMO, 2010) for language proficiency and communication skills require standard levels for cadets' communication skills throughout the world. However, these regulations fail to suggest how to bring together standardized Maritime English (ME) training and assessment on a global scale in order to consistently fulfill these requirements. The only people who are responsible for ensuring that cadets' maritime education and training skills are evaluated in accordance with an internationally standardized system are the teachers at the numerous MET institutions located all over the world. Because of this, there will undoubtedly be disparities in the ways that various communities perceive the ME criteria. [4]

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