

Putting People First – The Increasing Importance of Human Capital in the Green Transition

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Abstract

The nature of the maritime industry is changing rapidly as companies and stakeholders try to cope with the challenges of the green transition. This theoretical discourse seeks to highlight the role of human capital in this regard; the seafarers, shore-based personnel or the educators in promoting decarbonization agenda. While the paper emphasizes the need to train in new areas, namely, the application of new types of fuel and energy, digital knowledge, and environmental management, it exposes various issues, including the existence of skill gaps, training opportunities inequality, and resistance to change. The paper also explores the preparedness and contribution of MET institutions in shaping human capital for new emerging demands and explores the policy and governance framework for a just transition. From the outcomes of our review and analysis, it can be concluded that apart from the technological progress it should be noted that the success of green transition in the sphere of the maritime industry is determined by the opportunity to reveal and develop human capital, by upskilling, reskilling and investing in training.

Introduction

In this theoretical paper, which completes our decarbonization series, we delve into the evolving landscape of the maritime industry, emphasizing the imperative of addressing human factors in relation to decarbonization—a new and pressing reality for the sector. That being the case, it is to point out that in the process of coping with these challenges on the way to achieving “net zero” goals, **the emphasis on technology or infrastructure alone will not be enough**. The people linked to the marine environment, at sea, onshore, and in classrooms, are critical in making the industry not only environmentally conscious but also forward-leaning in a dynamic world.

The shift towards more environmentally friendly shipping practices requires a holistic approach that cannot envisage human capital only as a participant, but as an actor carrying out the change. Maritime decarbonization goals require that the relevant workforce be trained on the measures needed for decarbonization, that the seafarer and shore-based teams work in unison, and that there is good buy-in into the process due to the structural rigidities in the industry (Kenney,

2023). This paper aims at discussing how human capital in the maritime sector is managing to embrace these changes, the part played by education and training in enabling this transition, the skills necessary for embracing sustainability and the overall impacts on the sector as it seeks to transform into a “green” industry.

The Role of Human Capital in Maritime Decarbonization

Decarbonizing the world’s shipping fleet is not just about technology or management – the human factor that links ship as an asset to the business side of the operations is as vital (Kenney, 2023). With the adoption of the new technologies like the use of the new forms of energy such as the alternatives fuels and energy efficiency measures, the element of human capital becomes more pronounced. **What is required is a competent, knowledgeable and flexible workforce to support the implementation of these technologies.**

Realizing this change, the seafarers need not only training in technical aspects of their jobs but also invaluable knowledge of the consequences that their work entails upon the environment – which calls for a mindset shift. Such comprehension creates the need to embrace goals necessary for the industry’s green transition and new practices more effectively. That being said, there is usually a disparity between the technologies come up with in the shores and the experience of the seafarers out at sea. It is important that seafarers are aware of these innovations and are well informed and actively participating (Staal, 2023).

However, our experience indicates that great resistance exists in the maritime community toward embracing swiftly changes, being considered traditional in nature, and thus the importance of undertaking an anthropocentric approach towards decarbonisation cannot be overemphasised. Part of this resistance is due to concerns of the nature of the change, as some of these occupations, due to their demanding and otherwise rugged nature, are seen as more than a profession but a way of life. To this effect, there is a need for the application of tradition and innovation in that shipping companies will need to embrace changes for such reasons yet at the same time retain the status that is considered appealing to the current and future workers (Kenney, 2023).

Skills Needed for the Green Transition

The green transition in the maritime industry is leading to great demand for new types of skills and competencies (reskilling). As the industry shifts towards decarbonization, driven by the need to meet global environmental targets, the workforce must adapt to handle new technologies and operational methods. The following key skills have been identified as crucial for the maritime sector's green transition:

- **Technical Skills in Alternative Fuels:**

In a process that is still ongoing and that will most likely continue for years to come, the specific knowledge that seafarers and shore-based personnel will be required to comprehend and learn are those affiliated to the new fuels which include (but are not

limited to) hydrogen, ammonia, and methanol. This includes the specific properties of each fuel, safety and operational measures & protocols, and procedures connected with these new fuels.

- **Digital and STEM Skills:**

Digital technologies as smart ships and automated systems in maritime processes engender the need for workers with adequate STEM skills. These are important fundamental skills to enable the employees to operate, manage and troubleshoot sophisticated digital systems that are being introduced in the industry (World Economic Forum, 2024).

- **Environmental and Sustainability Knowledge:**

To enable mindset change, there is a require for employees to have a clear understanding of environmental laws, policies on sustainability, and the effects of maritime operations on the environment. It is important to note that such knowledge is necessary to improve the efficiency and decision-making process in accordance with the industry's decarbonization objectives. This means that training programs must also contain a range of relevant and extensive cases on environmental responsibility and sustainability (Global Maritime Forum, 2024).

- **Safety and Risk Management:**

New fuels and technologies increase the emphasis on safety and risk management skills. New operation practices require employees to be trained on how best to assess the risks as well as how to minimize them. This involves revising the safety measures emergency management in light of the hazards associated with the onset of alternative fuel types, as well as the use of automated systems (Maritime UK, 2024).

- **Organizational and Change Management Skills:**

This is therefore not just a technical change but also organisational. Employees especially managers require skills in change management to enable them facilitate change within their teams. This includes encouraging openness to change, willingness to learn, and cross-boundary cooperation at multiple levels within the organisation (World Economic Forum, 2024).

Education and Training: The Cornerstones of a Green Transition

Maritime Education and Training (MET) institutions play an important role in developing the human capital needed for the decarbonization of the industry. **A survey run by Maritime UK (2024) highlighted that the main barrier currently existing in acquiring skills related to the green transition is the lack (non-availability) of training opportunities.** MET institutions have the responsibility of preparing future maritime professionals with the knowledge, skills, and attitudes needed to operate within a decarbonized industry. This is critical also under the lens of 'People-Centred Clean Energy Transition' proposed by Kitada and colleagues (2023), which emphasizes the importance of education in supporting a socially sustainable transition.

In other words, METs also have a responsibility towards equipping modern seafarers with the right Knowledge, Skills & Abilities (KSAs), as the current setup of many training facilities lacks the necessary infrastructure, and their delivery methods are outdated. While this may have

served the industry so far and reflects the industry's traditionally conservative nature, METs must critically assess whether their training concepts and setups are truly adapted to meet the current and future needs of the industry (Manuel et al., 2019). The rapid advancements in maritime technology and the increasing complexity of environmental regulations demand a more dynamic and forward-thinking approach to education and training. This involves not only updating curricula but also investing in modern training facilities and adopting innovative teaching methods that align with the evolving demands of the global maritime industry.

An initiative towards updating METs standards, which is worth mentioning, is the International Association of Maritime Universities' (IAMU) Global Maritime Professional (GMP) Body of Knowledge which was established to identify the gaps and describe the competencies needed for efficient maritime professionals operating in the modern society. Although the GMP framework has incorporated environmental awareness and sustainability as competencies, there is a necessity of enhancing this framework to indicate the particular competences needed like the understanding of the alternatives of fuels and the management of energy (Manuel et al, 2019; Kitada et al. , 2023).

As with most higher learning initiatives, technical knowledge is important, but cognitive and affective learning areas including the need to consider the larger sustainability ecosystem is equally important for the institution's success. MET institutions must thus transform to delivery training solutions that will fit current decarbonization demands as well as future demand scenarios. This entails the updating of curricula where there is new discoveries in green technologies so as to offer practical training which is in line with the new technologies & alternative fuels (Kitada et al. , 2023).

Ensuring a Just Transition

Just transition is an important concept that should not be negated in the maritime sector while making ways towards "net zero". A just transition guarantees that such a change will not disempower workers and will allow them to participate in the creation of a green economy (Baumann, 2024). This is a significant task that must be accomplished step-by-step with the inclusion of policymakers, industry stakeholders, and the workforce.

A major concern when endeavouring to integrate the concept of a just transition is the question of the skills shortage in the maritime sector. Again, with the recent advancements in technologies, there is a probability that those members of the workforce who are not trained on the new technologies may lag behind. To counteract this, there needs to be a consistent and accessible supply of continuing professional development and lifelong learning to all the elements of the maritime workforce. This approach does not only encourage the individual career advancement, but the overall capacity of the industry to adapt and sustain itself during transformational processes (Baumann, 2024).

As it is well recognized, IMO is the main institutional player behind international regulation setting when it comes to maritime policy making. However, the process of developing policies in the IMO is both multilayered and chaotic due to various geopolitical factors and the participation

of many stakeholders, which can hamper the process of implementing proper decarbonization policies, leading to a “cloudy landscape” in training standards. To mitigate these factors, it is crucial to push for a collective solution that would involve seafarers and other marine workers (Baumann, 2024).

Conclusive Thoughts

The increasing importance of human capital in the maritime industry’s green transition reflects the critical role that people play in the successful adoption and implementation of new technologies and practices. But there are challenges nonetheless: this shift is not without its difficulties. This debate underscores the fact that the transition to more sustainable patterns and processes is a complex process that requires specific skills, and which can potentially widen existing economic and social disparities, involve resistance to change and is shaped by policy and governance systems.

The fact that skill development is a highly complex process is even more revealing, it not only entails the acquisition of new skills by the people working in the maritime industry, but it also needs to be done in a manner that is commensurate with the rate of growth in technologies. Thus, issues may arise in terms of relevant skills that could lead to the poor implementation of part of the necessary measures aimed at helping the industry towards the net zero goal.

Furthermore, as has been mentioned, the green transition entails significant prospect of job creation within the industry¹, although these possibilities may not be balanced. Indeed, it is a concern that with time, developing regions without well-developed infrastructure and education systems may be left even further behind, widening the inequality between developed and developing nations. This implies that the current global policy-making together with the skills development must be much more open for other regions to allow them enjoy the benefits of the green transition.

Another major challenge is the resistance to change from within the maritime workforce. Trying to make the industry greener will also be highly dependent on the industry’s ability to motivate the workers about the change while also handling concerns that are being brought up such as job insecurity and loss of tradition associated with certain occupations. This may be the reason why most organisations fail to implement change successfully, especially when faced with such resistance. Strong leadership and good change management strategies will be the only way to counter this kind of resistance.

Last but not the least, policy-making and governance are important sides in this context. Currently, the process of the policy formation is long and subjected to the different pressures and conditions of the environment though the policy can provide for the fundamental changes. It is therefore crucial to outline measures for ensuring that policies are coherent and include all

¹ Based on the Global Maritime Forum (2024) report: “Job creation will be seen across the three main phases of the supply chain: renewable energy generation, hydrogen production and e-fuel production.”

the relevant stakeholders, as well as for promoting flexibility and adaptability to overcome the mentioned challenges in the process of the green transition.

Therefore, the maritime industry is at a turning point in which human capital mobilization will define the success of the green shift. By focusing on skill development, reducing inequalities, mitigating resistance, and promoting good governance, the industry can place itself on the map for new sustainability goals on a global scale, aiming for change towards a more sustainable future.

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