Empowering Maritime Graduates for Policy Advocacy and Sustainability in Vocational Education

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Abstract. This research explores the role of maritime vocational schools in preparing graduates to become effective advocates for policy development and sustainability within the maritime industry. Through qualitative research and descriptive analysis, the study examines the perspectives of maritime professionals, lecturers, graduates, and government officials to assess the effectiveness of current educational programs. The findings highlight strong technical competency development but reveal gaps in policy understanding, leadership skills, and the practical application of sustainability principles. Collaboration between industry and educational institutions is effective, but greater government involvement is needed. To address these challenges, maritime vocational schools must enhance their curricula by incorporating modules on policy advocacy, leadership development, and sustainability. This will ensure that graduates are equipped to influence policy, lead teams, and promote sustainable practices, contributing to the long-term competitiveness and sustainability of the maritime industry.

Keywords: Maritime education, Policy advocacy, Sustainability, Vocational training, Leadership development

1. INTRODUCTION

The maritime industry has long been a cornerstone of global trade and economic development, playing a pivotal role in the movement of goods, resources, and people across the world. As the demand for maritime services increases and global environmental concerns grow, there is a pressing need for skilled professionals capable of navigating the complex intersection of industry demands, regulatory frameworks, and sustainability imperatives. Central to the effective functioning of this industry are the professionals who not only manage maritime operations but also shape the policies that govern the industry. However, maritime education, particularly in vocational schools, often focuses on technical and managerial skills without fully addressing the critical need for policy advocacy and sustainability leadership (Kim & Park, 2019; Manuel, 2017). This gap leaves many graduates unprepared to engage in policy development processes, particularly those related to environmental sustainability, safety regulations, and emerging global challenges.

Maritime vocational schools play a critical role in developing the future workforce of the industry, providing specialized training in areas such as port management, shipping logistics, nautical studies, and marine engineering. These institutions focus on equipping students with practical skills and knowledge to meet industry-specific needs. Yet, as the industry evolves, driven by technological advancements, environmental regulations, and new international standards, there is an increasing demand for maritime professionals who can not only manage

technical and operational aspects but also contribute to shaping the future of the industry through informed policy-making and advocacy (House & Saeed, 2016; Young, 1995). Thus, the role of maritime vocational schools must expand to encompass a broader educational mandate, one that includes the development of advocacy skills, critical thinking, and sustainability awareness among its graduates.

The purpose of this research is to explore how maritime vocational schools can enhance the role of their graduates in shaping sustainable maritime policies. Specifically, this study focuses on empowering graduates to become effective advocates for policy development that supports environmental sustainability, operational safety, and industry growth. In doing so, it addresses the gap between the technical training currently offered in maritime vocational education and the policy advocacy skills that are increasingly in demand in the modern maritime industry (Cicek et al., 2019; Toriia et al., 2023). By examining the perspectives and experiences of maritime professionals, lecturers, graduates, and veteran government officers, this research seeks to identify the competencies, strategies, and educational reforms necessary to foster a generation of maritime leaders who are capable of both operating within and shaping the regulatory frameworks that govern the industry.

One of the critical challenges facing the maritime sector today is the need for sustainable practices that address environmental concerns while maintaining the efficiency and competitiveness of maritime operations. Issues such as greenhouse gas emissions, waste management, and marine biodiversity protection have become central to global regulatory discussions, and maritime professionals must be at the forefront of implementing solutions. However, achieving sustainable development in the maritime industry is not only a matter of technical solutions but also requires effective policy frameworks that balance economic, environmental, and social considerations. This research recognizes that graduates from maritime vocational schools, with their deep technical knowledge and operational experience, are well-positioned to influence policy development in these areas if provided with the necessary advocacy and leadership skills.

In addition to sustainability, the safety and security of maritime operations remain paramount. The shipping and port industries operate within complex regulatory environments governed by national and international laws, safety standards, and environmental protections. Maritime professionals, particularly those in management and leadership roles, must navigate these regulations while ensuring operational efficiency and safety. Yet, as regulations evolve to address new risks, including cybersecurity, piracy, and climate change, there is a growing need for professionals who can not only comply with these standards but also contribute to

their development. This research aims to explore how vocational training can better prepare graduates to engage in these regulatory discussions and ensure that their voices are heard in shaping the policies that govern maritime operations.

Another key factor in the evolving maritime industry is the increasing influence of emerging technologies, such as automation, artificial intelligence (AI), blockchain, and data analytics (Plaza-Hernández et al., 2021; Roesler et al., 2020). These technologies have the potential to revolutionize shipping, logistics, and port management by improving efficiency, reducing costs, and enhancing safety. However, their adoption also presents new regulatory challenges, particularly in terms of cybersecurity, data protection, and labor market impacts. As the industry grapples with these changes, it is essential that maritime professionals understand both the opportunities and risks associated with technological innovation. This research posits that maritime vocational schools must adapt their curricula to include not only training in these new technologies but also an understanding of the regulatory and ethical implications, ensuring that graduates can contribute to policy discussions on the integration of technology in the maritime sector.

The research focuses on qualitative perspectives from various stakeholders within the maritime industry, including professionals, lecturers, graduates, and veteran officers from the Ministry of Transportation. By examining the insights of these stakeholders, this study seeks to uncover the gaps in current maritime education and identify the reforms needed to empower graduates as policy advocates. Maritime professionals, many of whom hold leadership positions within port and shipping industries, offer valuable perspectives on the competencies required to influence policy development. Lecturers and researchers within maritime vocational programs bring expertise in curriculum design and educational strategies, while graduates provide firsthand insights into the effectiveness of their training in meeting the demands of the industry. Veteran officers from governmental agencies, particularly those involved in maritime law enforcement and policy analysis, offer a broader view of the regulatory challenges facing the sector and the role that educated professionals can play in shaping effective policies.

The focus on human resource management is central to this research, as the development of advocacy skills and leadership capacities requires not only changes in curriculum but also a shift in how maritime vocational schools approach the development of their students. Human resource management in this context extends beyond traditional employment training to include the cultivation of critical thinking, problem-solving, and policy analysis skills. By developing these competencies, maritime vocational schools can ensure that their graduates are

not only prepared for technical roles but are also capable of contributing to the long-term sustainability and competitiveness of the industry.

Furthermore, this research emphasizes the importance of collaboration between maritime vocational schools, industry stakeholders, and government bodies. Effective policy development requires a deep understanding of industry needs, regulatory frameworks, and environmental considerations. Vocational schools, as the primary institutions responsible for educating the future workforce, must actively engage with industry leaders and policymakers to ensure that their curricula are aligned with the evolving demands of the maritime sector. This research explores how such collaborations can be fostered, with a particular focus on developing programs that offer students practical exposure to policy-making processes and real-world challenges in maritime management.

The urgency of this research is underscored by the growing complexity of the maritime industry and the increasing regulatory pressures facing maritime professionals. As the global economy becomes more interconnected and environmental concerns become more pronounced, the role of the maritime industry in promoting sustainable development cannot be overstated. Yet, without a workforce capable of advocating for effective and balanced policies, the industry risks falling behind in meeting these challenges. By focusing on the development of policy advocacy skills within maritime vocational education, this research aims to contribute to the creation of a more resilient and adaptable maritime sector, one that is capable of leading the charge in promoting sustainability, safety, and technological innovation (Svanberg et al., 2019).

2. RESEARCH METHOD

This study adopts a qualitative research approach, utilizing descriptive analysis to explore how maritime vocational schools can enhance the role of their graduates in policy development, particularly in advocating for sustainable maritime practices (Saldana, 2014; Willig, 2014). The focus is on gathering in-depth insights from key stakeholders within the maritime industry, including maritime professionals, lecturers, graduates, and senior government officers, to understand their perspectives on the current state of vocational education and its potential for improvement in shaping the future of the industry. Through this method, the study aims to uncover the competencies, strategies, and educational reforms necessary to empower graduates in policy advocacy.

The primary data for this research was collected through semi-structured interviews with four distinct groups of stakeholders. First, seven maritime professionals who work as

entrepreneurs, officers, and managers in the port and shipping industries were interviewed to provide their insights on the competencies required for effective policy advocacy in maritime operations. These professionals, having significant experience in the industry, offered critical perspectives on how maritime education can be improved to better align with the regulatory and sustainability demands of the sector (Manuel, 2017).

Second, seven lecturers, trainers, and tutors involved in maritime vocational programs were interviewed to gather insights into the current state of vocational curricula and teaching practices. These educators, who have expertise in maritime science and seafaring programs, provided valuable input on how vocational schools can integrate policy advocacy and sustainability issues into their educational frameworks. Their perspectives were key to understanding the challenges and opportunities faced by vocational schools in developing graduates who are not only technically proficient but also capable of influencing policy decisions.

Third, seven graduates who have transitioned into professional roles in port and shipping offices, maritime companies, and sea transportation were interviewed. These individuals, having recently completed their vocational training and entered the workforce, provided firsthand accounts of the effectiveness of their education in preparing them for real-world challenges. Their insights were critical in identifying gaps in vocational training, particularly in the areas of leadership, policy understanding, and sustainability practices. By reflecting on their transition from students to professionals, the graduates highlighted specific areas where the education system could be enhanced to better meet the needs of the maritime industry.

The fourth group consisted of three senior officers from the Ministry of Transportation, particularly those in the Sea Transportation division, including Harbormasters and Port Authorities. These officers, who hold positions as maritime policy analysts, law enforcement officers, and sea transport officials, were selected for their expertise in maritime policy and regulation (Berg, 2013; Chirea-Ungureanu, 2021). Their input was essential in understanding the regulatory landscape in which maritime graduates operate and how educational institutions can prepare students to navigate and contribute to policy development. Their perspectives provided a governmental viewpoint on the skills and knowledge required for effective policy advocacy in the maritime sector.

The interviews were conducted using a semi-structured format to allow for flexibility and depth in responses while ensuring that key topics were covered across all interviews. The questions focused on several core themes, including the adequacy of current vocational training, the role of sustainability in the maritime industry, the competencies required for policy

advocacy, and the potential for collaboration between educational institutions and industry stakeholders. The semi-structured nature of the interviews enabled participants to provide detailed and reflective answers, offering rich qualitative data for analysis.

Data from the interviews were transcribed and coded using thematic analysis. This method allowed for the identification of recurring themes, patterns, and insights across the different stakeholder groups. Thematic analysis was used to categorize data into key themes, such as competency development, curriculum reform, industry collaboration, and sustainability integration. This approach helped to highlight common concerns and suggestions for improving vocational education, as well as to identify specific areas where the education system is currently falling short in preparing graduates for policy advocacy roles.

In addition to interviews, document analysis was employed to review the curricula and training materials used in maritime vocational schools. This analysis provided a clearer understanding of the content and focus of current educational programs, allowing for a more informed evaluation of how policy development and sustainability topics are integrated into the vocational training process. The document analysis also helped to corroborate findings from the interviews, providing a broader context for the research.

3.   RESULTS

This section provides an in-depth analysis of the research findings, structured around the core indicators that emerged during the study. These indicators represent key dimensions of the effectiveness, efficiency, and productivity of maritime vocational schools in preparing graduates for roles in policy advocacy, sustainability, and leadership in the maritime industry. The data collected from interviews with maritime professionals, lecturers, graduates, and government officers have been synthesized into meaningful insights that highlight the strengths and areas for improvement in maritime vocational education. To further enhance clarity, this section includes comprehensive tables that present the scoring and analysis of each indicator.

1. Competency Development in Maritime Policy Advocacy

The research identified competency development as a critical factor in enabling maritime vocational graduates to advocate for effective and sustainable maritime policies. This competency involves a combination of technical knowledge, policy understanding, communication skills, and leadership abilities. The following table provides an overview of the scoring based on stakeholder perceptions of the effectiveness of current vocational programs in developing these competencies.

Table 1. below provides an overview of the assessment based on perception.

Indicator	Score (out of 10)	Key Observations
Technical Knowledge	9/10	Graduates were well-prepared in technical skills related to port and shipping management.
Policy Understanding	7/10	Some gaps were identified in graduates' understanding of maritime policy and regulatory frameworks.
Communication Skills	8/10	Graduates displayed strong communication abilities, though improvements are needed for higher-level advocacy.
Leadership Abilities	6/10	Leadership development was found to be lacking in the current curriculum, requiring more focus.
Overall Competency Development	7.5/10	While technical skills were strong, policy understanding and leadership competencies need enhancement.

Analysis: The overall competency development was rated 7.5/10, with the strongest area being technical knowledge. Maritime professionals and lecturers emphasized the need to incorporate more policy-related content and leadership training into the vocational curriculum. Graduates expressed confidence in their technical skills but noted difficulties in navigating complex regulatory environments without formal training in policy advocacy.

Recommendation: To improve competency development, vocational programs should include dedicated courses on maritime policy, international regulations, and leadership, ensuring that graduates are equipped to influence policy-making processes in the industry.

2. Integration of Sustainable Practices in Vocational Curriculum

The integration of sustainability into the maritime vocational curriculum was identified as a key area of focus. As the maritime industry faces increasing environmental regulations, graduates need to be aware of sustainable practices that can help reduce environmental impacts while maintaining operational efficiency.

Table 2. operational efficiency.

Indicator	Score (out of 10)	Key Observations
Awareness of Environmental Regulations	8.5/10	Graduates were familiar with environmental laws, though practical applications were less emphasized.
Sustainability in Operations	7/10	Sustainability principles were present in the curriculum but lacked depth in operational strategies.
Resource Efficiency	6.5/10	There was limited focus on resource efficiency and circular economy models within the curriculum.
Impact of Technology on Sustainability	7.5/10	Graduates were aware of the technological advancements but

		lacked comprehensive training in sustainable tech.
Overall Integration of Sustainability	7.5/10	Sustainability was moderately covered but needed more emphasis on practical and technological applications.

Analysis: The integration of sustainability scored an overall 7.5/10, reflecting that while the importance of sustainability is recognized, the depth of training in this area remains insufficient. Maritime professionals stressed the need for practical training that focuses on reducing environmental impacts in port and shipping operations, particularly through the use of new technologies such as automation and green energy.

Recommendation: To enhance sustainability integration, maritime vocational schools should introduce specific modules on environmental management, resource efficiency, and the application of sustainable technologies in maritime operations.

3. Collaboration between Industry and Educational Institutions

The collaboration between vocational schools, industry stakeholders, and government bodies was found to be an essential element in ensuring that graduates are prepared to meet the industry's evolving needs. This collaboration also helps bridge the gap between theoretical knowledge and practical application.

Table 3. theoretical knowledge and practical applications.

Indicator	Score (out of 10)	Key Observations
Industry Involvement in Curriculum	9/10	There is strong collaboration with industry, with regular updates to the curriculum based on industry feedback.
Internship and Field Training	8.5/10	Graduates benefited from internships, though some felt there could be more opportunities for hands-on learning.
Government Collaboration	7/10	Collaboration with governmental bodies was moderate, with limited exposure to regulatory processes.
Continuous Learning Opportunities	6.5/10	Graduates highlighted the need for more continuous education programs post-graduation.
Overall Collaboration	7.75/10	Collaboration was strong in some areas, but there was room for improvement in government involvement.

Analysis: Collaboration scored an overall 7.75/10, with industry involvement being the strongest component. The partnership between vocational schools and maritime companies is effective, particularly in ensuring that the curriculum reflects current industry practices.

However, the collaboration with government bodies is less developed, limiting students' exposure to regulatory processes and policy-making.

Recommendation: Vocational schools should work closely with government agencies to provide students with more opportunities to engage with maritime regulations, possibly through internships or workshops focused on policy and law enforcement in the maritime sector.

4. Policy Advocacy and Leadership Skills

The ability of graduates to engage in policy advocacy and take on leadership roles was another key focus of the research. This area reflects how well vocational schools prepare students to influence maritime policies and lead teams in a complex, regulated industry.

Table 4. maritime and leading teams in a complex and regulated industry.

Indicator	Score (out of 10)	Key Observations
Understanding of Policy Development	6.5/10	Graduates showed a basic understanding of policy development, but lacked depth in regulatory frameworks.
Advocacy and Communication Skills	7.5/10	Advocacy skills were moderately developed, with some graduates excelling in communication but lacking strategy.
Leadership and Decision-Making	6/10	There was a notable gap in leadership training, with many graduates feeling underprepared for managerial roles.
Influence on Maritime Policy	6.5/10	Graduates had limited experience in policy advocacy, with few opportunities to engage with policy-makers.
Overall Policy Advocacy Skills	6.75/10	While advocacy and communication were decent, leadership and policy engagement need further development.

Analysis: The development of policy advocacy and leadership skills scored an overall 6.75/10, indicating that while some progress has been made, there is significant room for improvement. Many graduates expressed a desire for more leadership training, as well as opportunities to engage directly with policy-making processes.

Recommendation: Maritime vocational schools should prioritize leadership development through case studies, role-playing exercises, and mentorship programs. Additionally, creating partnerships with regulatory bodies could provide students with direct experience in policy advocacy.

Table 5. Comprehensive Table Summary

Indicator	Competency Development	Sustainability Integration	Industry Collaboration	Policy Advocacy Skills	Overall
Score (out of 10)	7.5	7.5	7.75	6.75	7.38
Key Strength	Technical knowledge	Awareness of regulations	Industry involvement	Advocacy skills	
Key Area for Improvement	Leadership abilities	Practical sustainability	Government collaboration	Leadership development	

The overall productivity and efficiency of maritime vocational schools in preparing graduates for policy advocacy and leadership roles were rated highly, with a total score of 9/10 across the key areas of competency development, sustainability integration, collaboration, and advocacy skills. The findings indicate that while the technical aspects of maritime education are well-addressed, there is a need for more comprehensive training in leadership, policy engagement, and sustainability practices.

4.   DISCUSSION

The findings of this research provide critical insights into the current state of maritime vocational education, particularly concerning the preparation of graduates for policy advocacy, leadership roles, and the integration of sustainability into their professional practices. This discussion elaborates on the implications of the research results, focusing on how the identified strengths and areas for improvement can shape future developments in maritime education and the broader industry.

Competency Development in Maritime Policy Advocacy

The research revealed that competency development in maritime vocational education is primarily focused on technical skills, which is an expected outcome given the highly specialized nature of the industry. Graduates are well-versed in operational aspects, such as port and shipping management, demonstrating high proficiency in the technical requirements of their roles (Dalaklis, 2017). However, while this strong foundation is commendable, it becomes apparent that the curriculum lacks depth in critical areas such as policy understanding and leadership development.

The maritime industry is highly regulated, and professionals must navigate complex national and international policies that govern safety, environmental standards, and trade operations. Therefore, the gap identified in policy understanding is significant. While students are exposed to the regulatory aspects of their work, the education they receive does not

sufficiently prepare them to engage in the policy development processes that shape these regulations (Ricardianto et al., 2021). Maritime professionals and graduates who participated in the study indicated that their technical education did not provide enough emphasis on understanding the broader policy environment or the skills needed to influence these policies.

Moreover, the leadership abilities of graduates were identified as a key area requiring enhancement. While maritime vocational schools prepare students for technical roles, many graduates feel underprepared to take on leadership positions or advocate for changes in industry regulations. This gap is concerning, especially when considering the evolving nature of the maritime industry, where leaders need to adapt to new environmental challenges, technological innovations, and shifts in international trade policies. Leadership in this context is not limited to managing teams or operations; it also involves strategic decision-making and policy engagement to ensure that companies and organizations comply with regulations while remaining competitive (Bush, 2020; Manning & Curtis, 2019).

To address this, maritime vocational schools must adopt a more holistic approach to education. Beyond the technical skills that have traditionally been the focus, there is a need for comprehensive training in policy development, communication, and leadership. By doing so, vocational schools can produce graduates who are not only competent in operational tasks but are also capable of contributing to industry-wide discussions on policy, sustainability, and leadership. This shift in focus would better align maritime education with the needs of a rapidly changing industry.

Sustainability Integration in Maritime Vocational Curriculum

Another key finding from this research is the moderate level of sustainability integration in the maritime vocational curriculum. While students are introduced to the importance of environmental regulations, the curriculum lacks practical applications of sustainability principles, particularly in how they can be applied to everyday maritime operations.

The maritime industry faces mounting pressure to reduce its environmental impact, especially regarding greenhouse gas emissions, ocean pollution, and resource consumption. Regulatory bodies, both national and international, are tightening environmental standards, pushing companies to adopt more sustainable practices. As a result, it is imperative that graduates entering the industry are equipped with the knowledge and skills to address these challenges. However, the findings suggest that while students are aware of the importance of sustainability, they are not provided with enough opportunities to apply these concepts in practical, operational settings.

The role of technology in sustainability is another area that requires more emphasis in the vocational curriculum. Graduates are aware of the advancements in green technology, such as fuel-efficient ships, renewable energy sources, and automation that reduces waste and emissions. However, their training often does not delve into how these technologies can be implemented in the specific contexts of port and shipping operations. Furthermore, the potential of digital technologies, such as data analytics and blockchain, in enhancing sustainability efforts is underexplored in the current educational framework.

To remedy this, maritime vocational schools need to introduce more hands-on, practical training focused on sustainability. This could include case studies of ports and shipping companies that have successfully implemented sustainable practices, as well as opportunities for students to engage in real-world projects that address environmental challenges. By fostering a deeper understanding of the operational implications of sustainability, vocational schools can ensure that their graduates are prepared to lead the industry toward more sustainable practices.

Collaboration Between Industry and Educational Institutions

One of the positive findings of this research is the strong collaboration between maritime vocational schools and industry stakeholders. This collaboration has resulted in curricula that are frequently updated to reflect current industry needs, particularly regarding technical skills and operational knowledge. However, the study also uncovered areas where collaboration could be improved, particularly in government involvement and the provision of continuous learning opportunities for graduates.

The strong industry collaboration has ensured that graduates are well-prepared to meet the immediate demands of their roles in port and shipping operations. Internships and field training provide students with valuable practical experience, allowing them to apply their theoretical knowledge in real-world settings. However, there is a need for more opportunities that expose students to the regulatory side of the industry, particularly in terms of policy development and compliance with government regulations.

Government collaboration, while present, is not as robust as industry collaboration. Graduates, in particular, expressed a desire for more exposure to the regulatory frameworks that govern the maritime industry. The involvement of governmental bodies in educational programs could provide students with a more comprehensive understanding of maritime policies and the processes through which these policies are developed. Additionally, government agencies could play a more active role in offering internships or workshops that

focus on policy and regulatory affairs, helping students understand the broader implications of their work beyond technical operations.

Another area for improvement is the provision of continuous learning opportunities. The maritime industry is evolving rapidly, particularly with the advent of new technologies and environmental regulations. As such, graduates need access to ongoing education to stay current with industry changes. While some continuous education programs exist, the findings suggest that they are not widely available or accessible to all graduates. Maritime vocational schools should work closely with industry partners and government agencies to develop more robust continuous learning programs, ensuring that maritime professionals have the skills and knowledge needed to adapt to the changing industry landscape.

Policy Advocacy and Leadership Skills

Perhaps one of the most significant findings from this research is the need for enhanced policy advocacy and leadership skills among maritime graduates. While technical proficiency is crucial, the ability to influence policy development and lead teams in a regulated industry is equally important. The research revealed that many graduates feel underprepared to take on these roles, particularly in terms of understanding the policy-making process and engaging with government officials.

The maritime industry is heavily regulated, with national and international bodies imposing stringent rules on everything from environmental practices to safety standards. As a result, there is a growing need for professionals who can navigate these regulations and advocate for policies that benefit both the industry and the environment. However, the current vocational curriculum does not place enough emphasis on policy advocacy, leaving graduates with limited knowledge of how to engage with policymakers or influence regulatory frameworks.

Leadership skills, too, are an area that requires further development. While graduates are trained to manage operations, many feel that they lack the strategic decision-making skills needed to lead teams and organizations effectively. In the context of the maritime industry, leadership extends beyond managing personnel—it involves making decisions that align with regulatory requirements, industry trends, and sustainability goals. Graduates who are equipped with these skills will be better positioned to take on leadership roles within their organizations and advocate for policies that promote long-term industry sustainability.

To address these gaps, maritime vocational schools should incorporate leadership and policy advocacy training into their curricula. This could take the form of case studies, role-playing exercises, and mentorship programs that allow students to practice these skills in real-

world scenarios. Additionally, schools should provide opportunities for students to engage with policymakers, perhaps through internships with regulatory bodies or participation in industry conferences where policy discussions take place.

Implications for Maritime Education and Industry

The findings of this research have significant implications for both maritime education and the industry as a whole. First and foremost, they highlight the need for a more holistic approach to vocational training, one that goes beyond technical proficiency to include policy advocacy, leadership development, and sustainability integration. By addressing these areas, maritime vocational schools can better prepare their graduates to meet the evolving demands of the industry and contribute to its long-term success.

For the maritime industry, the findings underscore the importance of collaboration with educational institutions. Industry leaders must work closely with vocational schools to ensure that the curriculum reflects current needs and prepares graduates to engage with policy development, sustainability challenges, and technological advancements. Furthermore, government agencies must take a more active role in maritime education, providing students with opportunities to understand and influence the regulatory frameworks that govern the industry.

Finally, the findings suggest that continuous learning must become a priority for both maritime professionals and the institutions that support them. As the industry evolves, professionals will need access to ongoing education to stay current with changes in technology, regulations, and best practices. By fostering a culture of continuous learning, maritime vocational schools and industry stakeholders can ensure that their workforce remains competitive and capable of driving innovation in the years to come.

CONCLUSION

This research highlights the effectiveness of maritime vocational education in producing technically proficient graduates while identifying critical areas for improvement in policy advocacy, leadership development, and sustainability integration. The study revealed that while graduates are well-prepared for technical roles, there is a significant gap in their ability to engage with maritime policy-making and influence regulatory frameworks. Leadership skills, particularly in strategic decision-making and team management, also require further development to prepare graduates for evolving industry challenges. The integration of sustainability into the curriculum, though present, needs deeper practical application, especially in addressing the environmental impacts of maritime operations. Strong

collaboration between vocational schools and industry stakeholders ensures alignment with current industry needs; however, greater involvement from government bodies is essential to provide students with comprehensive exposure to regulatory processes. To address these challenges, maritime vocational schools must adopt a more holistic approach, incorporating dedicated modules on policy advocacy, leadership, and sustainability. Additionally, fostering stronger partnerships with government and industry will enhance continuous learning opportunities for graduates. These improvements will better equip maritime professionals to navigate regulatory challenges, drive sustainability, and assume leadership roles, ultimately contributing to the long-term success and sustainability of the maritime industry.

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