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Construction Of A Lifelong Learning Based Master Mariner Development Model: A Qualitative Study On The IMMA Member Continuing Education Program At IBM Asmi Jakarta

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Abstract

Indonesia's maritime sector requires competent, professional, and globally competitive human resources, particularly Master Mariners whose responsibilities extend beyond navigation to vessel management, leadership, and regulatory compliance. Rapid digitalization, automation, green shipping, and changing industry requirements further emphasize the need for continuous professional development. This study aims to construct a Lifelong Learning-based Master Mariner Development Model through the continuing education program of Indonesia Master Mariner Association (IMMA) members at IBM ASMI Jakarta. The study employs a qualitative approach using Constructivist Grounded Theory, based on Glaser and Strauss (1967) and Strauss and Corbin (1998). Data were collected through in-depth semi-structured interviews, observation, documentation, and field notes, with data collection and analysis conducted simultaneously through open, axial, and selective coding and constant comparative analysis. The findings reveal that educational motivation arises from self-development, professional advancement, social recognition, and organizational support. Higher education is interpreted as self-transformation, professional identity reinforcement, career mobility, and lifelong learning. IMMA functions as a motivator, learning community, and agent of professional transformation, while IBM ASMI Jakarta provides flexible education and strengthens academic competencies. The discussion shows that Lifelong Learning transforms seafaring experience into academic, professional, and leadership competencies, strengthening professionalism, adaptability, and global competitiveness. The resulting model integrates foundation, driving forces, learning processes, transformation, and outcomes. Theoretical implications strengthen Lifelong Learning and human capital perspectives, while practical implications support IMMA programs, maritime

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education, industry development, and government policy.

Keyword: **Master Mariner, Lifelong Learning, Maritime Human Resource Development, Professional Development, Maritime Leadership.**

INTRODUCTION

Indonesia is the world's largest archipelagic country, with more than 17,000 islands and approximately 70% of its territory consisting of water. This geographical condition makes the maritime sector a strategic pillar of national development and creates a strong need for highly competent, professional, and globally competitive maritime human resources. One of the key professions is the Master Mariner, who holds the highest level of responsibility for navigation safety, vessel management, crew, cargo, and compliance with national and international regulations.

The transformation of the global maritime industry has expanded the competency requirements of Master Mariners beyond technical sailing skills, non-academic certification, and practical experience. Modern maritime professionals are increasingly expected to possess managerial and leadership capabilities, effective communication skills, strategic decision-making abilities, and an understanding of technological developments and international regulations. Consequently, higher education at undergraduate, master's, and doctoral levels can complement practical maritime experience by strengthening intellectual capacity and broadening strategic perspectives.

Rapid developments in digitalization, Artificial Intelligence, ship automation, green shipping, environmental sustainability, and international safety standards have further emphasized the importance of continuous professional development. Initial education and training are no longer sufficient to address the changing demands of a lifelong maritime career. The concept of Lifelong Learning therefore becomes increasingly relevant, as emphasized by UNESCO, which views learning as a continuous process that enables individuals to adapt to technological, economic, and social changes.

For Master Mariners, lifelong learning provides an opportunity to complement extensive sailing experience with competencies in management, strategic leadership, information technology, global communication, business, and maritime research. Although practical experience provides strong operational and leadership capabilities, these additional competencies are often strengthened through formal academic education. World Maritime University (2021) highlights the importance of academic development in supporting maritime

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professionals in responding to contemporary industry requirements.

The development of Indonesian maritime human resources still faces several challenges, including gaps between industry requirements and workforce competencies, limited access to continuing training, and insufficient international certification among some maritime professionals. Higher maritime education has an important role in addressing these challenges, although curriculum development, educational quality, and stronger integration between educational institutions and industry remain necessary. These conditions demonstrate the importance of creating continuous learning pathways that connect professional experience with formal academic development.

Within the Indonesia Master Mariner Association (IMMA), there is an emerging trend of experienced Master Mariners pursuing formal education at undergraduate, master's, and doctoral levels after long careers at sea. This phenomenon reflects growing awareness that practical sailing experience and academic knowledge are complementary foundations for professional development. The strategic collaboration between IMMA and Institut Bisnis dan Multimedia (IBM) ASMI Jakarta further strengthens this development by providing opportunities for professional mariners to pursue higher education as part of a lifelong learning process.

The collaboration between IMMA and IBM ASMI Jakarta also represents a broader shift from professional development based primarily on technical training and STCW certification toward an integrated model combining technical, academic, managerial, and leadership competencies. The partnership provides mutual benefits: IMMA can strengthen its role in facilitating members' continuous development, while IBM ASMI Jakarta can expand its connection with the maritime industry and align education, research, and community engagement with practical needs. This synergy reflects the triple helix concept involving cooperation among education, professional organizations, and industry.

The researcher occupies a strategic position in this context because of direct involvement in the development of the collaboration between IMMA and IBM ASMI Jakarta. This position provides access to empirical information, key actors, and organizational processes, while methodological safeguards such as Constructivist Grounded Theory, researcher reflexivity, an audit trail, triangulation, and member checking are used to maintain scientific rigor. The study therefore seeks not merely to describe the existing collaboration, but to construct a conceptual model of Master Mariner development based on Lifelong Learning. The model is expected to contribute to maritime human resource management and adult learning while providing practical guidance for professional organizations, higher education institutions, industry,

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regulators, and other stakeholders in developing Indonesian maritime human resources that are knowledgeable, professional, adaptive, and globally competitive.

LITERATURE REVIEW

Master Mariner Concept

The Master Mariner represents the highest professional qualification in the merchant shipping profession, authorizing a seafarer to serve as the Master/Captain with responsibility for the safety of navigation, crew, cargo, the marine environment, and compliance with national and international regulations. In the development of the modern maritime industry, the competencies of a Master Mariner are no longer limited to navigational skills and seafaring experience but also encompass technical, managerial, leadership, communication, decision-making, and adaptability to digital technologies. Ghosh et al. (2025) demonstrate that changes in the maritime working environment have created a need to review seafarer competency and skills frameworks, particularly in response to evolving industry requirements and technological developments. Accordingly, the Master Mariner should be understood as a professional who integrates operational experience with academic and strategic competencies.

The competencies of a Master Mariner essentially encompass technical, managerial, leadership, digital-adaptive, and academic competencies. Technical competencies include navigation, ship stability, cargo management, safety, emergency response, and risk control, while managerial competencies involve crew management, vessel operations, administration, and strategic decision-making. The development of automation and digitalization has also created new competency requirements, including digital navigation, maritime information systems, cybersecurity awareness, and data-based decision-making. Fan and Yang (2023) emphasize that technological changes and automation are transforming the role of seafarers, requiring their competencies to be continuously evaluated within the context of human–technology system interaction. Meanwhile, Shi et al. (2024) demonstrate that seafarer competencies are closely associated with safety and accident risks, indicating that competency development needs to be carried out systematically and continuously.

Maritime leadership refers to the ability of a Master Mariner to influence, direct, and coordinate the crew so that vessel operations are conducted safely, effectively, and efficiently. Such leadership encompasses communication, team management, conflict management, crisis management, and decision-making, as well as the ability to establish a strong safety culture within a multicultural working environment. Studies on safety leadership indicate that effective leadership on board can strengthen safety culture, improve safety behavior, and support the

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protection of the marine environment. Kumara et al. (2026) further demonstrate that the development of maritime leadership needs to integrate technical competencies, human factors, communication, situational awareness, teamwork, and decision-making through continuous human resource development. Therefore, the leadership of a Master Mariner is derived not only from formal authority but also from the ability to build trust, demonstrate exemplary behavior, and foster collective learning within the shipboard environment.

Seafarer professionalism represents an integration of professional competence, integrity, responsibility, commitment to safety, and the capacity for lifelong learning. A Master Mariner is expected to maintain professional standards through mastery of knowledge and skills, ethical decision-making, compliance with regulations, and commitment to the safety of people, ships, cargo, and the marine environment. Research on safety culture indicates that competence, individual characteristics, safety awareness, and organizational factors contribute to the development of safe behavior among seafarers. In the Indonesian context, the development of maritime human resources continues to face gaps between industry requirements, educational curricula, continuing training, and international certification. Therefore, the professionalism of Master Mariners needs to be developed holistically by integrating work experience, education, leadership, integrity, and safety culture.

Lifelong Learning has become an important dimension in Master Mariner development because technological change, digitalization, automation, regulatory developments, and sustainability requirements continue to transform the nature of work in the shipping sector. Continuous learning enables seafarers to undertake upskilling and reskilling through formal education, training, certification, seminars, research, professional organizations, mentoring, coaching, and experiential learning. Theotokas, Lagoudis, and Raftopoulou (2024) demonstrate that shipping digitalization creates new skill requirements while simultaneously increasing the importance of education and lifelong learning for the maritime workforce. Narayanan, Emad, and Fei (2023) likewise conceptualize seafarer learning as an ongoing process within a shipboard working environment undergoing technological transformation. In the Indonesian context, the continuous development of maritime human resources through education and training is increasingly important for strengthening the competitiveness of maritime professionals at both national and global levels.

Lifelong Learning

Lifelong Learning refers to a continuous learning process that takes place throughout an individual's life through formal, non-formal, and informal education. The concept emphasizes

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the need for individuals to continuously update their knowledge, skills, and competencies in response to rapid social, economic, technological, and cultural changes. In the modern maritime industry, learning is no longer viewed as an activity that ends after formal education but as a continuous process embedded in professional life. For Master Mariners, Lifelong Learning is particularly important because changes in international regulations, maritime technology, digitalization, and modern leadership requirements demand continuous competency development. In this study, Lifelong Learning serves as the main foundation for understanding how members of the Indonesia Master Mariner Association (IMMA) perceive further education as part of their professional development and efforts to enhance the competitiveness of Indonesian maritime human resources.

The concept of Lifelong Learning was broadly promoted by UNESCO through the Learning to Be (Faure Report, 1972) and further strengthened through Learning: The Treasure Within (Delors Report, 1996). UNESCO emphasizes four fundamental pillars of lifelong education: Learning to Know, which develops knowledge and critical thinking; Learning to Do, which focuses on applying knowledge and skills in practice; Learning to Live Together, which develops cooperation and intercultural communication; and Learning to Be, which promotes individual potential, leadership, integrity, professionalism, and strategic thinking. Meanwhile, Jarvis (2006) views learning as a process through which individuals transform experience into knowledge, skills, attitudes, values, and beliefs. This process involves experience, reflection, meaning-making, and self-transformation. In the context of Master Mariners, extensive seafaring experience provides practical knowledge, while higher education creates opportunities for critical reflection and the transformation of professional experience into new knowledge and competencies.

According to Candy (1991), Lifelong Learning emphasizes an individual's capacity to learn independently throughout life. It includes self-directed learning, personal development, continuous education, and participation in a learning society. These dimensions are reflected in Master Mariners' ability to identify their competency-development needs, pursue higher education, strengthen leadership and managerial capabilities, and participate in professional learning communities such as IMMA. Complementing this perspective, Knowles' Adult Learning Theory (Andragogy) emphasizes that adult learners are characterized by their need to understand the purpose of learning, self-concept, prior experience, readiness to learn, problem-oriented learning, and internal motivation. These principles are highly relevant to Master Mariners, who generally enter higher education with substantial professional experience and pursue further learning in response to technological and regulatory changes, career

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development, self-actualization, and their desire to contribute to the maritime profession.

Based on the synthesis of the perspectives of UNESCO, Jarvis, Candy, and Knowles, Lifelong Learning in this study is constructed through five main concepts: learning motivation, awareness of self-development, continuous learning, adaptation to change, and experience-based learning. Learning motivation refers to the internal and external factors encouraging Master Mariners to pursue further education, including competency improvement, career development, self-actualization, academic achievement, and professional contribution. Awareness of self-development reflects an understanding of the importance of continuously improving personal capacity in response to changes in the maritime industry and emerging competency requirements.

Continuous learning encompasses formal education, professional training, certification, seminars, workshops, and self-directed learning throughout a professional career. Adaptation to change refers to the ability to respond to technological developments, regulatory changes, globalization, and maritime digitalization. Finally, experience-based learning emphasizes the integration of professional experience with new knowledge through reflection, the use of seafaring experience as a learning resource, the integration of theory and practice, and the transformation of experience into new knowledge. These five dimensions provide the conceptual foundation for examining how Master Mariners develop themselves through lifelong learning and how professional experience can be transformed into academic, managerial, leadership, and strategic competencies.

Concept of Maritime Human Resource Development

Human Resources (HR) constitute a strategic asset that plays an important role in determining organizational success while strengthening competitiveness amid changes in the industrial environment. In the maritime sector, HR development is not only concerned with meeting the needs of the operational workforce but also represents an important component in supporting the transformation of the shipping industry and the development of the maritime economy. The development of digitalization, automation, and emerging technologies in the shipping industry has increased the demand for new competencies and highlighted the importance of HR development strategies focused on upskilling, reskilling, education, and continuous learning (Theotokas et al., 2024). In the Indonesian context, maritime HR development is also an important factor in supporting the blue economy, enhancing workforce competencies, and strengthening maritime competitiveness at both the national and global levels (Kristiawan & Marsudi, 2025).

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The development of digital technologies, the implementation of smart shipping and green shipping, shipping automation, and increasingly stringent international regulatory requirements have transformed the competency needs of maritime human resources. Consequently, maritime HR development is no longer focused solely on technical seafaring competencies but also encompasses managerial, academic, leadership, and adaptability competencies required to respond to global changes.

In the context of this study, maritime human resource development is understood as an effort to enhance the professional and academic capacity of Master Mariners through formal education, lifelong learning (Lifelong Learning), professional experience, and the support of professional organizations and educational institutions.

Concept of Professional Organizations and Higher Education in Human Resource Development

In the era of the knowledge-based economy, human resource development cannot be the sole responsibility of individuals or educational institutions. Synergy among professional organizations, higher education institutions, industry, and government is required to establish a learning ecosystem that supports the continuous development of competencies. Professional organizations serve as platforms for professional development, competency enhancement, professional protection, and the strengthening of members' professional identities. Meanwhile, higher education institutions function as institutions that produce, develop, and transform knowledge through education, research, and community service.

In the context of maritime human resource development, collaboration between professional organizations and higher education institutions has become increasingly important because changes in the maritime industry require the integration of professional experience with the strengthening of academic capacity. For a Master Mariner, extensive seafaring experience needs to be supported by the development of knowledge, critical thinking skills, and managerial competencies, which are generally acquired through higher education.

The Role of the Indonesia Master Mariner Association (IMMA) in This Study

The Indonesia Master Mariner Association (IMMA) is positioned in this study as a professional organization with a strategic role in fostering a culture of Lifelong Learning among Master Mariners. IMMA functions not only as a professional association but also as a learning institution that encourages the continuous development of members' competencies, leadership, professionalism, and readiness to respond to changes in the global maritime industry. From the perspective of Constructivist Grounded Theory, IMMA's role is understood

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through the experiences, interactions, and meanings constructed by its members during their participation in further education programs.

IMMA serves as a facilitator of Lifelong Learning by creating an ecosystem that supports continuous professional development through higher education, seminars, workshops, training, scientific discussions, mentoring, coaching, and knowledge sharing. At the same time, IMMA acts as an agent of professional transformation by encouraging a shift from a purely technical and certification-oriented professional paradigm toward broader academic, managerial, leadership, and strategic competencies. This transformation enables Master Mariners to develop beyond operational practitioners into maritime leaders, educators, researchers, consultants, and policymakers who can contribute more broadly to national maritime development.

Furthermore, IMMA functions as a bridge between professional practice and higher education, particularly through its collaboration with IBM asmi Jakarta. This collaboration integrates the practical experience of Master Mariners with academic knowledge, research, and higher education. It also facilitates knowledge exchange between practitioners and academics, allowing professional experiences to be transformed into scholarly knowledge while enabling academic findings to contribute to professional practices in the maritime industry. In the perspective of Lifelong Learning, this collaboration establishes a maritime learning ecosystem connecting education, research, professional organizations, and the needs of the shipping industry.

Conceptually, these three roles position IMMA as both a learning organization and an agent of professional development that facilitates lifelong learning among Master Mariners. IMMA therefore becomes an important component in the construction of the Master Mariner Development Model Based on Lifelong Learning, integrating seafaring experience, higher education, leadership development, and industry needs in a continuous and structured process. This role is an important factor in constructing a development model aimed at producing Master Mariners who are competent, adaptive, professionally grounded, and globally competitive.

The Relevance of IBM asmi in Research

In this study, IBM asmi Jakarta is positioned as a higher education institution that serves as an enabler of Lifelong Learning for IMMA members. Its role extends beyond the provision of formal education to include professional transformation, leadership development, strengthening academic capacity, and generating knowledge that is relevant to the needs of the maritime industry.

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The synergy between IBM asmi Jakarta as an academic institution and IMMA as a professional organization establishes a Maritime Lifelong Learning Ecosystem. Within this ecosystem, professional experience, formal education, research, professional networks, and industry needs interact to produce the Master Mariner Development Model Based on Lifelong Learning, which represents the novelty of this study. The model is expected to serve as a reference for the development of maritime education, professional organizations, and policies for maritime human resource development in Indonesia.

METHOD

This study employs a qualitative approach using the Grounded Theory method. The qualitative approach was selected to gain an in-depth understanding of the experiences, motivations, perceptions, and learning processes of members of the Indonesia Master Mariner Association (IMMA) who participate in further education programs at IBM ASMI Jakarta. According to Creswell and Poth (2018), qualitative research is an approach used to explore and understand meanings derived from individuals or groups concerning social or human problems. Grounded Theory, as developed by Glaser and Strauss (1967) and further refined by Strauss and Corbin (1998), is employed because the study aims to construct a Master Mariner Development Model Based on Lifelong Learning from empirical data rather than directly adopting an existing theoretical model. Data collection and analysis are conducted simultaneously through open coding, axial coding, and selective coding to identify core concepts and relationships among seafaring experience, professional competencies, educational motivation, professional organizational support, and the higher education environment.

The study also adopts a constructivist paradigm, which views social reality as constructed through individual experiences, interactions, and interpretations of their environment. Accordingly, the experiences of IMMA members undertaking further education at IBM asmi Jakarta constitute the primary source for understanding the implementation of Lifelong Learning in developing the professionalism and academic capacity of Master Mariners. The characteristics of Grounded Theory in this study include being oriented toward discovering a new theory or model, being grounded in empirical field data, applying systematic and sequential coding, conducting data collection and analysis simultaneously, prioritizing participants' perspectives and experiences, and generating a substantive theory relevant to the development of Indonesian Master Mariners. Through this approach, the study is expected to produce the Master Mariner Development Model Based on Lifelong Learning as a theoretical contribution to maritime human resource management and a practical contribution for professional

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organizations, higher education institutions, the shipping industry, and the government in developing sustainable maritime human resources in Indonesia.

Data collection in this study is conducted simultaneously with data analysis, consistent with the principles of Grounded Theory. The primary technique is in-depth, semi-structured interviews to explore participants' motivations for pursuing further education, learning experiences, perceptions of higher education, the roles of IMMA and IBM asmi Jakarta, professional development, and the implementation of Lifelong Learning. The interviews are recorded, transcribed, and analyzed progressively. Observations are conducted to understand the social and academic context of IMMA members' educational experiences, including learning activities, interactions among students, interactions between students and lecturers, and academic activities involving IMMA members. Documentation studies examine relevant materials, including the IMMA–IBM asmi Jakarta Memorandum of Understanding (MoU), study program curricula, IMMA organizational documents, students' academic data, educational activity reports, and maritime human resource development policies. In addition, field notes are maintained throughout the research process to record researcher reflections, observations, initial interpretations, and emerging conceptual ideas.

Data analysis follows the Grounded Theory procedure developed by Strauss and Corbin (1998), beginning with the first data collected and continuing throughout the research process until completion. The analysis involves open coding, in which interview transcripts are repeatedly reviewed to identify, code, and group concepts with similar meanings, such as learning motivation, family support, seafaring experience, career development, and academic achievement; axial coding, which connects emerging categories and identifies relationships among conditions, actions, and consequences, such as educational motivation → further education → competency development → professionalism; and selective coding, which integrates all categories to identify the core category and construct a substantive theory, namely "Master Mariner Transformation through Lifelong Learning." The analysis also applies constant comparative analysis, whereby new data are continuously compared with previous data, established categories, and emerging concepts until theoretical saturation is achieved.

RESULTS

Motivation for Master Mariners to Continue Education

The interview findings indicate that IMMA members' decisions to pursue higher education are not driven solely by the desire to obtain academic degrees but are also part of a broader process of *self-development and professional self-actualization.* The open coding

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process identified several major categories of motivation, including self-development, professional development, social recognition, and organizational support. These categories indicate that further education is perceived as an important means of expanding knowledge, strengthening professional capacity, and preparing for changing career demands.

The first category is *self-development motivation*, in which most informants viewed higher education as a means of broadening their knowledge and improving their personal capacity. One informant stated, "I am already a Master Mariner, but I feel that I still need to learn so that my knowledge and perspective become broader, and so that I can obtain academic qualifications from undergraduate to postgraduate levels rather than relying solely on experience at sea." This category includes the desire to learn, self-actualization, academic thinking, and the development of intellectual capacity.

The second category is *professional motivation*, in which informants perceived higher education as a means of strengthening their professionalism and career prospects. The emerging categories include strengthening academic and managerial competencies, preparing for post-seafaring careers, and improving professional competitiveness. Higher education is therefore understood not merely as an academic achievement but as a means of complementing practical seafaring experience with broader academic and managerial capabilities.

The third and fourth categories are *social and organizational motivation*. Informants indicated that pursuing higher education could provide a sense of pride for their families, social recognition, and an opportunity to serve as role models for younger generations of seafarers. At the organizational level, encouragement from IMMA was identified as a significant factor, particularly through inspiration from senior members, organizational programs, and the development of a learning culture within the professional community. These findings suggest that the decision to pursue higher education is shaped by an interaction between personal aspirations, professional needs, social expectations, and organizational support.

Meaning of Higher Education for Master Mariners

The findings indicate that higher education is interpreted in diverse ways by Master Mariners, extending beyond the acquisition of academic qualifications. The analysis identified four major meanings: education as self-transformation, professional identity reinforcement, career mobility, and lifelong learning. These meanings demonstrate that higher education is perceived as an important process for developing both personal and professional capacities.

First, higher education is understood as a means of self-transformation, particularly through the development of systematic, critical, and strategic thinking. Second, it serves to

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strengthen professional identity by providing academic recognition and legitimacy to the professional experience that Master Mariners have already acquired. This process contributes to stronger professionalism, greater self-confidence, and a more established professional identity.

Third, higher education is perceived as a means of career mobility, preparing Master Mariners for roles such as lecturers, maritime consultants, shipping company managers, and professional organization leaders. Finally, education is understood as a form of lifelong learning, reflecting the belief that learning has no age limit and is a continuous need and journey throughout professional life.

The Role of IMMA in Encouraging Member Education

The findings indicate that IMMA makes a significant contribution to fostering a learning culture among Master Mariners. IMMA functions as a motivator by providing inspiration, encouraging members' enthusiasm for learning, and serving as a role model through the experiences of senior members. At the same time, IMMA operates as a learning community that facilitates experience sharing, professional discussions, and knowledge exchange among its members. These functions create an environment in which continuous learning becomes part of the professional culture of Master Mariners.

Furthermore, IMMA acts as an agent of professional transformation by encouraging changes in the traditional professional paradigm, promoting formal education, and strengthening an academic culture within the maritime professional community. Through these roles, IMMA extends its function beyond professional networking and competency development toward facilitating the integration of professional experience, academic learning, and continuous self-development. This contribution supports the development of Master Mariners who are more academically oriented, adaptive, and prepared to respond to changes in the maritime industry.

The Role of IBM asmi Jakarta as an Educational Institution

IBM asmi Jakarta is perceived as an institution that provides flexible and relevant educational opportunities for maritime professionals. Its role includes providing access to higher education, offering flexibility in the learning process, and providing academic support that enables Master Mariners to pursue further education while accommodating their professional backgrounds and responsibilities.

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Furthermore, IBM asmi Jakarta contributes to the development of academic competencies by strengthening research, analytical, and academic writing skills. It also serves as a bridge between professional practice and academic knowledge by facilitating the integration of seafaring experience with theoretical perspectives, broadening professional insights, and transforming practical knowledge into academically relevant understanding.

Formation of Professionalism through Lifelong Learning

This theme emerged as the core category in the development process of Master Mariners. The analysis indicates that Lifelong Learning generates significant changes in several dimensions, particularly professionalism and leadership. In terms of professionalism, continuous learning strengthens integrity, professional ethics, and professional responsibility. At the leadership level, it enhances leadership, decision-making, and strategic thinking, enabling Master Mariners to perform their roles with greater confidence and broader perspectives.

Furthermore, Lifelong Learning strengthens adaptability to change and global competitiveness. Master Mariners are required to continuously adapt to developments in maritime technology, international regulations, and transformations within the maritime industry. At the same time, continuous learning supports the development of international competencies, global perspectives, and collaborative capabilities, enabling Master Mariners to respond more effectively to the demands of the global maritime environment.

Construction of a Master Mariner Development Model Based on Lifelong Learning

The open coding process identified several major concepts emerging from the data, including seafaring experience, professional competencies, educational motivation, support from the professional organization, support from the higher education institution, continuous learning, professionalism, and leadership. These concepts represent the main dimensions of the experiences and development processes of the Master Mariners participating in the study.

The axial coding process revealed relationships among the emerging categories. The causal conditions consisted of seafaring experience, professional competencies, and educational motivation, while the intervening conditions included support from IMMA and IBM asmi Jakarta. These factors contributed to the process of Lifelong Learning, formal academic education, and reflection on professional experience, which subsequently generated several consequences, particularly enhanced professionalism, leadership, and academic competencies.

The selective coding process identified the core category, namely “Master Mariner Transformation through Lifelong Learning.” This core category integrates the relationships

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among seafaring experience, professional competencies, educational motivation, organizational and institutional support, continuous learning, and the resulting development of professionalism, leadership, and academic competencies. Thus, the core category represents the overall transformation process experienced by the participants through the integration of professional experience and lifelong learning.

Lifelong Learning-Based Master Mariner Development Model

Based on the overall research findings, a substantive model of Master Mariner development is constructed through a sequential transformation process. The model begins with three main inputs, namely seafaring experience, professional competencies, and educational motivation. These inputs are strengthened by supporting conditions consisting of the roles of IMMA and IBM ASMI Jakarta. The interaction between these factors creates a transformation process through Lifelong Learning, formal education, reflection on professional experience, and competency development.

The transformation process produces several key outputs, including academic competencies, professionalism, leadership, and competitiveness. These outputs ultimately contribute to the development of a Master Mariner who is knowledgeable, professionally respected, and globally competitive (berilmu, bermartabat, dan berdaya saing global). Thus, the model illustrates that Master Mariner development is not merely the accumulation of technical experience but a continuous transformation that integrates professional experience, academic education, organizational support, reflection, and lifelong learning.

MODEL OF RESEARCH RESULTS

Basic Model Philosophy

The model is built on the premise that a *Master Mariner does not stop learning after reaching the highest position on board*, but continues to develop through a lifelong learning process aimed at enhancing personal capacity, professionalism, leadership, and contribution to the maritime sector. In this perspective, education is positioned as an integral part of the professional journey of a Master Mariner rather than as an end in itself.

This concept is consistent with the philosophy of *"Once a Learner, Always a Learner"* and the principle of *"Master Mariner as a Lifelong Learner",* both of which emerged consistently from the narratives of the research informants. These principles emphasize that professional maturity should be accompanied by a continuous commitment to learning, reflection, and self-development throughout the Master Mariner's professional career.

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Model Structure

The proposed model consists of five interconnected components that collectively form a process of professional transformation for Master Mariners. The first component is the Foundation, which represents the initial capital possessed by a Master Mariner, particularly sea-going experience and professional competence. Sea-going experience provides practical knowledge in technical operations, decision-making, risk management, and operational leadership, while professional competence is developed through maritime education, STCW certification, work experience, and professional training. Together, these elements provide the essential foundation for further professional development.

The second component is the Driving Forces, which encourage Master Mariners to engage in lifelong learning. These driving forces include internal motivation, family support, and organizational support. Internal motivation encompasses self-actualization, the desire to learn, career development, academic achievement, and the desire to contribute to the maritime sector. Family support may take the form of moral, emotional, and financial support, while organizational support, particularly from IMMA, is reflected in organizational encouragement, learning communities, professional networks, and member development programs. These factors strengthen the continuity and sustainability of the learning process.

The third component is the Lifelong Learning Process, which includes formal education, professional training, and self-directed learning. Formal education may involve undergraduate, master's, and doctoral programs that strengthen intellectual and academic capacity. Training includes professional training, competency certification, seminars, workshops, and professional courses, while self-directed learning involves reading academic literature, participating in webinars and professional discussions, conducting independent research, and using technology for self-development. These learning activities enable Master Mariners to continuously update and expand their knowledge and competencies throughout their professional careers.

The fourth component is Transformation, which represents the direct outcomes of the learning process. This transformation occurs through the development of academic, professional, and leadership competencies. Academic competencies are reflected in critical thinking, research, analytical, and academic writing abilities. Professional competencies include stronger managerial capabilities, improved decision-making, and enhanced professionalism. Meanwhile, leadership development encompasses strategic leadership, organizational leadership, and transformational leadership. This transformation reflects a shift in the professional identity of the Master Mariner from an experienced maritime practitioner toward a more comprehensive maritime leader.

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The fifth component is the Outcome, which is the development of a knowledgeable, dignified, and globally competitive Master Mariner. A Master Mariner Berilmu possesses broad academic knowledge, scientific thinking, and the ability to generate new knowledge. A Master Mariner Bermartabat demonstrates integrity, upholds professional ethics, and serves as a professional role model. Finally, a Master Mariner Berdaya Saing Global is characterized by adaptability to change, the ability to compete internationally, and a global perspective. Thus, the model illustrates a continuous transformation from experience and professional competence → driving forces → lifelong learning → professional transformation → a knowledgeable, dignified, and globally competitive Master Mariner.

Model Visualization

IMMA Lifelong Learning Model for Master Mariner Development

FOUNDATION

|

Sailing Experience

Professional Competencies

|

▼

DRIVING FORCES

|

Internal Motivation

Family Support

Organizational Support (IMMA)

|

▼

LIFELONG LEARNING PROCESS

|

Formal Education

Training

Self-Paced Learning

|

▼

TRANSFORMATION

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Academic Competence

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Professional Competencies
Leadership
|
▼
OUTCOME
|
KNOWLEDGEABLE MASTER MARINER
MASTER MARINER OF DIGNITY
GLOBALLY COMPETITIVE MASTER MARINER
(Source: Researcher, 2026)

IMPLICATIONS

Theoretical Implications of the Model

The model provides a theoretical contribution to the development of maritime human resource management through several key aspects:

1. Strengthening the Theory of Lifelong Learning
   The study demonstrates that the concept of Lifelong Learning can be effectively applied to the maritime profession, which has traditionally been strongly oriented toward experience-based learning.
2. Development of Human Capital Theory
   The study demonstrates that investment in education for Master Mariners contributes to the improvement of human capital quality, encompassing academic, professional, and leadership competencies.
3. Development of Professional Development Theory
   The model demonstrates that professional development does not end with professional certification but continues through higher education and continuous learning throughout a Master Mariner's professional career.

Practical Implications of the Model

For IMMA, the model can serve as a basis for designing member development programs that integrate professional experience, higher education, and Lifelong Learning. It can also encourage the development of a continuous learning culture within the professional community and support the preparation of future maritime leaders with broader academic, professional, and leadership competencies.

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For IBM asmi Jakarta, the model can serve as a reference for developing educational programs specifically designed for maritime professionals. In particular, the model encourages the development of curricula that integrate the practical experiences of seafarers with academic knowledge, enabling learning activities to be more relevant to the professional realities and development needs of Master Mariners.

For the maritime industry, the implementation of this model can contribute to the availability of more competent maritime human resources who possess not only technical expertise but also academic, managerial, and leadership capabilities. The model can therefore support the improvement of the quality of maritime leadership at the national level and strengthen the capacity of Master Mariners to respond to changes and challenges within the maritime industry.

For the government, the model can serve as a reference for formulating and strengthening policies related to sustainable maritime human resource development. Its implementation can support the development of competent, professional, adaptive, and globally competitive maritime personnel, thereby contributing to Indonesia's broader vision of becoming a global maritime axis

RESEARCH NOVELTY

Theoretical Novelty

This study produces a new conceptual model entitled the IMMA Lifelong Learning Model for Master Mariner Development, which specifically explains the development of Master Mariners through a Lifelong Learning approach. The model offers a specific framework for understanding how continuous learning contributes to the professional, academic, and leadership development of Master Mariners. Based on the findings of this study, such a model has not been specifically identified in previous maritime research in Indonesia.

The theoretical novelty of this study also lies in the integration of three development domains within a single maritime human resource development framework: the professional organization (IMMA), the higher education institution (IBM asmi Jakarta), and the Master Mariner profession. This integration demonstrates how professional experience, academic education, and organizational support can interact to facilitate continuous competency development and professional transformation, thereby providing a more comprehensive perspective on the development of Master Mariners through Lifelong Learning.

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Conceptual Novelty

This study introduces the concept of Master Mariner as a Lifelong Learner, positioning the Master Mariner not only as a shipboard leader but also as a lifelong learner who continuously develops academic, professional, and leadership competencies.

Practical Novelty

This model can be used as:

1. A guideline for the development of IMMA members.
2. A reference for maritime education institutions.
3. A basis for formulating Indonesian maritime human resource development policies.

REFERENCE

Candy, P. C. (1991). Self-Direction for Lifelong Learning: A Comprehensive Guide to Theory and Practice. San Francisco: Jossey-Bass.

Creswell, J. W., & Poth, C. N. (2018). Qualitative Inquiry and Research Design: Choosing Among Five Approaches (4th Edition (ed.)). Sage Publication Inc.

Fan, S., & Yang, Z. (2023). Analysing Seafarer Competencies in a Dynamic Human-Machine System. Ocean & Coastal Management, 240(106662), 1–9. https://doi.org/10.1016/j.ocecoaman.2023.106662

Ghosh, S., Emad, G. R., & Ravi, A. (2025). Investigating the Characteristics of Skills and Competency Frameworks Through a Systematic Literature Review: A Feasibility Study to Revise the STCW Code for Seafarer Training. Australian Journal of Maritime & Ocean Affairs, 17(4), 616–632. https://doi.org/10.1080/18366503.2024.2374606

Glaser, B. G., & Strauss, A. L. (1967). The Discovery of Grounded Theory: Strategies for Qualitative Research. Chicago: Aldine Publishing.

Jarvis, P. (2006). Towards a Comprehensive Theory of Human Learning. . London: Routledge.

Kristiawan, D., & Marsudi, S. (2025). Sustainable Maritime Human Resource Development Strategy in Supporting the Blue Economy in Indonesia. International Journal of Marine Engineering and Applications, 2(2), 111–117. https://doi.org/10.30649/ijmea.v2i2.393

Kumara, R. B., Suprapti, F., Hermawati, R., & Sagala, A. I. (2026). Pengembangan Maritime Leadership Berbasis Human Factor Melalui Integrasi Kompetensi Teknik Maritim dan Maritime Human Resource Development pada Pendidikan Tinggi Maritim di Indonesia. Jurnal Universal Technic, 5(1), 43–67. https://doi.org/10.58192/unitech.v5i1.5237

Narayanan, S. C., Emad, G. R., & Fei, J. (2023). Theorizing Seafarers' Participation and Learning

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in an Evolving Maritime Workplace: An Activity Theory Perspective. WMU Journal of Maritime Affairs, 22(April), 165–180. https://doi.org/10.1007/s13437-023-00311-8

Shi, K., Fan, S., Weng, J., & Yang, Z. (2024). Seafarer Competency Analysis: Data-Driven Model in Restricted Waters Using Bayesian Networks. Ocean Engineering, 311(2), 119001. https://doi.org/10.1016/j.oceaneng.2024.119001

Strauss, A. L., & Corbin, J. (1998). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory (2nd ed.). SAGE Publications.

Theotokas, I. N., Lagoudis, I. N., & Raftopoulou, K. (2024). Challenges of Maritime Human Resource Management for the Transition to Shipping Digitalization. Journal of Shipping and Trade, 9(6), 1–23. https://doi.org/10.1186/s41072-024-00165-0

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