

Efforts to Develop the Management of Educator and Educational Personnel Standards in Maritime Vocational Education

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Article Info

Keywords:

*Educational Personnel Standards,
Competencies of educators,
Vocational Education*

Received: 2025-04-14; **Reviewed:** 2025-05-02;

Revised: 2025-05-14; **Accepted:** 2025-10-30;

Published: 2025-11-07

Abstract

The national education system of Indonesia aims to enlighten the nation's life by developing students' potential into individuals who are faithful, morally upright, healthy, capable, creative, independent, and responsible democratic citizens. The educational framework includes curriculum, teaching methods, evaluation, and management of educational institutions designed to shape character and moral values. Although the government has established National Education Standards related to the qualifications and competencies of educators and academic personnel, various issues still exist in their development and management. Therefore, innovations are necessary to achieve holistic quality education.

Purpose – This research aims to determine the qualification standards and competencies of educators in maritime education, as well as to understand the evaluation and supervision standards applied.

Methodology – The research employs a qualitative approach, utilizing literature analysis from various regulations related to higher vocational maritime education in Indonesia.

Findings – The findings suggest that changes in educator standards are essential for maintaining relevance in the face of rapid developments in the maritime industry, particularly in technology and regulations. This change process involves continuously evaluating industry needs. However, challenges such as limited qualifications of educators, the inability of standards to respond to changes, ineffective evaluation systems, a lack of oversight, restricted access to professional training, and misalignment between programs need to be addressed.

Originality – Continuous professional training for educators must be conducted so that graduates possess skills aligned with industry needs in the maritime sector.

INTRODUCTION

The Republic of Indonesia has the constitutional obligation to educate its citizens, as mandated in the Preamble of the Constitution of the Republic of Indonesia (Manan, 2015). In accordance with this mandate, the government administers education based on a national education system that functions to develop the Nation's capabilities, shape its character, and build a dignified civilization in order to enhance the nation's intellectual life (Harisman, 2021; Nurdin, 2015). The primary goal is to nurture students' potential so that they become individuals who have faith in and devotion to God Almighty, possess noble character, are healthy, knowledgeable, competent, creative, independent, and responsible democratic citizens. National education aims to achieve these objectives through the development of various aspects of students' personalities (Muchtarom et al., 2016). The national education system encompasses several key components, including curriculum, learning methods, evaluation, and institutional management. The curriculum is designed to provide a foundation of essential knowledge and skills for students, while learning methods are tailored to stimulate understanding and problem-solving abilities (Putri & Abdullah, 2024). Lidice et.al (2013) said the evaluation serves to measure students' achievements and to improve the overall quality of education. Furthermore, National education seeks to foster the character development of students by strengthening moral, ethical, and honesty values. The government strives to create a conducive educational environment for cultivating well-rounded personal development (Sain et al., 2024).

Education, therefore, does not solely emphasize academic aspects but also involves the formation of positive attitudes and values. Through a well-implemented national education system, it is expected that students will grow into individuals who are not only intellectually capable but also socially aware, respectful of diversity, and motivated to contribute to national development. Education is directed toward holistic intellectual advancement, enabling individuals to make positive contributions to societal and national progress (Spiel et al., 2018). In line with these goals, the government has established the National Education Standards, consisting of eight key standards, one of which concerns the standards for educators and educational personnel (Helda & Syahrani, 2022; Suryadarma & Jones, 2013). Rusilowati & Wahyudi (2020) said The qualifications, criteria, skills, competencies, and certifications required of educators and educational staff have been determined by the government to support the realization of an educated nation. However, in practice, various challenges persist in the development and management of these standards. Therefore, innovative approaches are needed to address such issues effectively.

Educator Standards

According to Law No. 20 of 2003 of the Republic of Indonesia concerning the National Education System, an *educator* refers to educational personnel who are qualified as teachers, lecturers, counselors, tutors, learning facilitators, instructors, or other designations according to their specific expertise and who participate in the delivery of education. The term *educator* thus refers to an individual professionally engaged in teaching or providing education (Krishnaveni & Anitha, 2007; Ping et al., 2018). Educators may work at various educational levels, from elementary and secondary schools to higher education institutions. The primary role of an educator is to guide and facilitate students in developing knowledge, skills, attitudes, and values. To equip educators with the necessary knowledge, abilities, and skills to perform their duties effectively, proper and continuous training is essential (Allais, 2010; Daminov et al., 2020). For such training to develop and bring benefits, it must follow a systematic process, which generally includes three main stages: needs assessment, implementation, and evaluation (Phillips & Phillips, 2016; Rusilowati & Wahyudi, 2020). The responsibilities of an educator encompass several key aspects (Darmadi, 2015; Fatmawati, 2021), including:

1. Teaching – delivering learning materials, explaining concepts, and assisting students in understanding lessons.
2. Guidance – providing direction and support for students' academic and personal development.
3. Evaluation – assessing students' progress through examinations, assignments, projects, and other

forms of assessment.

4. Curriculum Development – helping design or develop learning materials and curricula according to students' needs.
5. Personal Development – encouraging students' personal and professional growth, including the development of social and character skills.

Educators may work in various educational institutions, including schools, universities, training centers, and other learning organizations. It is vital for educators to possess strong communication skills, an understanding of students' needs and learning styles, and a deep sense of dedication to their role in teaching and mentoring.

Educational Personnel Standards

The term *educational personnel* refers to individuals who work in various fields and roles within educational institutions but are not directly involved in teaching activities. They play a vital role in ensuring the smooth operation and effective management of educational processes. The term *educational personnel* is often used broadly and encompasses a variety of functions and responsibilities (Phakamach et al., 2023). Examples of educational personnel roles include:

1. Administrative Staff – responsible for administrative tasks such as managing student records, organizing examinations, and scheduling institutional events.
2. Library Staff – manage library operations, including book collection management, user assistance, and literacy promotion.
3. Financial Staff – handle financial matters of the educational institution, including staff payroll, budget management, and financial reporting.
4. Student Welfare Officers – provide support related to students' physical and emotional well-being, often engaging in counseling or developing welfare programs.
5. Laboratory Technicians – responsible for maintaining laboratory equipment and facilities, as well as assisting teachers during experiment preparation and practical sessions.
6. Facilities and Infrastructure Staff – maintain and manage the school's physical facilities, including buildings, gardens, and other infrastructure.
7. Public Relations Officers – involved in communication and public relations activities such as managing the school's website, coordinating events, and promoting the institution.
8. The specific roles and responsibilities of educational personnel may vary depending on the type and level of the educational institution. Although they are not directly engaged in teaching, educational personnel play a crucial part in creating a supportive, organized, and efficient learning environment.

Vocational Education Standards

Vocational education aims to equip students with the knowledge and skills required to perform specific jobs, ranging from simple applied technologies to advanced modern technologies. It is designed to ensure that learners possess technological competencies applicable to real-world professional settings, as well as mastery of continuously evolving technological tools (Dede, 2010; Education, 2007; Fishman et al., 2016). An effective and efficient model of vocational education emphasizes several core competencies (Daryono et al., 2023; Huang, 2025), including communication skills (Suroto et al., 2017), critical and creative thinking (Korotaj & Buchberger, 2025; Samani et al., 2019), information and digital literacy (Jia & Huang, 2023; Setiyawan et al., 2023), inquiry and reasoning abilities (Maknuna, 2019; Thomas & Litowitz, 1986), interpersonal skills (Henderson & Fisher, 2008; Jaedun et al., 2024), multicultural literacy (Kang, 2020; Sucuoğlu & Bahçelerli, 2024), problem-solving (Herlina & Mustain, 2020; Hidayati & Wagiran, 2020; Kang, 2020), STEM proficiency (Mustain, 2020; Pagkratis, 2024) and technological proficiency (Habibi et al., 2023). These competencies are fundamental in preparing students to adapt and thrive in dynamic work environments driven by innovation and technology.

According to Law of the Republic of Indonesia No. 20 of 2003 on the National Education System, Indonesia recognizes several key terms related to education, such as education pathways, education levels, types of education, and educational units (Winangun, 2017). An *education pathway* refers to the route taken by students to develop their potential through a learning process aligned with educational

objectives (Liya, 2016; Meyers & Nulty, 2009). *Education levels* represent stages established based on the learner's developmental progress, targeted goals, and competencies to be developed (Kurikulum et al., 2006; Sakdiah & Syahrani, 2022). *Types of education* categorize educational programs according to their specific purposes, encompassing general, vocational, academic, professional, religious, and special education (Mahande, 2023). Meanwhile, *educational units* refer to institutions that organize educational services within formal, non-formal, or informal pathways across all levels and types of education (Rembangsupu et al., 2022; Tumanggor et al., 2021).

Key Educational Terms Based on Law No. 20 of 2003 on the National Education System (Noor, 2018). According to the Law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System, there are several key terms related to education that must be understood:

- a. Education Pathway – refers to the route taken by learners to develop their potential through an educational process aligned with the goals of education. *Example:* Education pathways include formal schooling, vocational education, and various non-formal or informal learning routes.
- b. Education Level – represents stages established based on the learner's developmental progress, objectives to be achieved, and competencies to be developed. *Example:* Education levels include early childhood education, basic education (elementary and junior secondary), secondary education (senior high school or equivalent), and higher education (diploma, bachelor's, master's, and doctoral programs).
- c. Type of Education – denotes categories based on the specific objectives of an educational institution, encompassing general, vocational, academic, professional, religious, and special education. *Example:* Types of education include general education focusing on general knowledge, vocational education that prepares students for specific occupations, academic education offered in higher education institutions, and other specialized forms of learning.
- d. Educational Unit – refers to educational service entities that provide learning through formal, non-formal, and informal pathways at all educational levels and types. *Example:* Educational units include formal schools, vocational training centers, higher education institutions, non-formal course providers, and various forms of informal learning services.
- e. This law provides the legal foundation for regulating Indonesia's education system, establishes fundamental principles, and offers a framework for managing, developing, and improving the overall quality of education nationwide.

Development and Management of Maritime Vocational Education

Maritime vocational education is a specialized branch of higher vocational education designed to meet the specific needs of the maritime sector, which holds strategic importance for Indonesia as an archipelagic nation. Unlike general vocational education, which encompasses a wide range of applied disciplines, maritime vocational education focuses on mastering technical and practical competencies directly related to marine resource management, shipping, fisheries, marine technology, and maritime safety and security (Manuel, 2017).

Jogo & Rosmayana (2025) argue that education not only prepares graduates to possess applied skills relevant to maritime professions but also instills local wisdom and cultural values inherent to Indonesia's maritime identity—such as respect for the marine environment and the sustainable use of ocean resources. Moreover, maritime vocational education integrates principles of scientific integrity, honesty, and social responsibility within the broader context of managing Indonesia's vast and diverse maritime territories. Consequently, graduates are expected to be technically proficient while also aware of the importance of maintaining national sovereignty and preserving the sustainability of the marine ecosystem. Therefore, maritime vocational education serves as a strategic and specialized program that contributes directly to national development through the cultivation of competent and ethical human resources in the maritime sector (Hartanto, 2020).

Vocational education offered to graduates of secondary education or its equivalent is designed to develop practical skills and reasoning in applying scientific and technological knowledge. Such programs are known as *diploma programs*, which prepare students to become skilled practitioners ready to enter the workforce in their respective fields. Diploma programs are divided into four levels: Diploma

I (Ahli Pratama), Diploma II (Ahli Muda), Diploma III (Ahli Madya), and Diploma IV (Bachelor of Applied Science). Graduates of applied bachelor's programs may continue their studies in applied master's programs and subsequently in applied doctoral programs.

RESEARCH METHOD

This study employs a literature review approach based on various regulations related to higher vocational maritime education in Indonesia. The collected data were analyzed in depth using a qualitative analysis method (Sarosa, 2021), and the results were presented descriptively. The research also involved field observations conducted at maritime higher education institutions during the 2024–2025 academic year to examine the learning methods that had been implemented. Meanwhile, observation is a method of data collection carried out systematically through direct examination of a phenomenon under study (Dachliyani & Sos, 2019).

The data sources used in this study include primary data, which were collected directly from relevant sources specifically related to the research problem (Rukajat, 2018). Data collection regarding educators and educational personnel was conducted through qualitative methods involving in-depth analysis. This process included various techniques such as in-depth interviews, participatory observations, and document analysis of lecturers teaching in maritime vocational institutions and educational personnel involved in administrative and managerial functions. These methods aimed to gain a comprehensive understanding of the competencies, experiences, and challenges faced by educators.

The collected data were analyzed qualitatively to identify patterns, themes, and relevant insights. The findings were then presented descriptively, providing a detailed and holistic overview of the conditions and quality of educators and educational personnel, including aspects related to ethics, performance, and professional development needs. Through this approach, it is expected that rich and valuable information will be obtained to support the planning and development of strategies for improving the quality of maritime vocational education.

Data analysis and interpretation were conducted continuously throughout and after the data collection process. During data collection, analysis helped sharpen the research focus and refine issues relevant to the study's core problems. Post-collection analysis continued this process by systematically presenting the data, confirming propositions, hypotheses, concepts, or patterns derived from field findings. In qualitative research, the analysis process is often iterative—researchers may complement or refine existing data if gaps are identified, ensuring alignment with the study's focus.

This research, which focuses on the Development Model for Managing Educator and Educational Personnel Standards in Maritime Vocational Education, involves multiple participants directly related to maritime vocational education and the maritime sector. The key participants include:

1. Lecturers teaching in maritime vocational higher education institutions.
2. Educational personnel involved in the administration and management of vocational education.

By engaging these diverse participant groups, the study aims to gain a comprehensive perspective on the challenges and opportunities in developing and managing standards for educators and educational personnel within maritime vocational education. The findings are expected to contribute to the development of a model aligned with both national and international standards, as well as the actual needs of the maritime education field.

RESULTS AND DISCUSSIONS

To develop the research scope matrix for *“Efforts to Develop the Management of Educator and Educational Personnel Standards in Maritime Vocational Education,”* the following format can be used. This matrix encompasses the main dimensions to be examined as in the table 1, the relevant variables, and the indicators that can be used to measure these variables.

Table 1. Matrix encompasses the main dimensions

Dimension	Variable	Indicator
Educator Qualifications and Competence	Academic Qualification	Highest educational attainment, relevance of field of study
	Work Experience	Years of teaching, experience in the maritime industry
	Pedagogical Competence	Ability to develop lesson plans (RPP), teaching methods, mastery of subject matter
	Certification and Training	Number of competency certifications, types of training attended
Professional Development	Training and Development Programs	Frequency and type of training, evaluation of training effectiveness
	Participation in Seminars and Workshops	Number of seminars/workshops attended, contribution to academic forums
	Evaluation and Feedback	Educator performance evaluation system, feedback from students and colleagues
Management and Administration	Recruitment System	Recruitment criteria, selection process, transparency of job vacancy information
	Career Development	Career development programs, promotion pathways, job rotation policies
	Infrastructure and Facilities	Availability of supporting infrastructure and technology for learning
Industry Collaboration	Existence of MoUs with Maritime Industry	MoUs with shipping companies, ports, or maritime institutions
	Industry Involvement in Curriculum Design	Industry representatives participating in curriculum meetings
	Internship / Industrial Practice Programs	Students undertaking internships at shipping companies or ports
	Joint Training for Educators and Staff	Workshops on new maritime navigation technologies organized with industry
	Graduate Absorption Rate in Industry	Data on graduates employed in the maritime sector
Curriculum and Learning Materials	Research or Innovation Projects with Industry	Joint research and innovation projects related to maritime safety
	Curriculum Relevance to Industry Needs	Curriculum alignment with industry standards and current maritime practices
	Learning Methods	Use of modern learning methods such as simulations, digital labs, and field practice
Evaluation and Quality Assurance	Educator Performance Evaluation System	Mechanisms for performance evaluation, use of key performance

	indicators (KPI)
Student Learning Outcomes Evaluation	Evaluation methods (tests, projects, practical assessments)
Internal and External Quality Audits	Frequency of audits, internal audit teams, external accreditation

Explanation

1. Educator Qualifications and Competence: This dimension focuses on the educational background, work experience, and competencies of educators, including the certifications and training programs they have completed.
2. Professional Development: This dimension examines existing professional development programs, including training sessions, seminars, workshops, and mechanisms for evaluation and feedback that contribute to the continuous improvement of educator quality.
3. Management and Administration: This dimension assesses recruitment systems, career development processes, and the adequacy of infrastructure that supports educational activities.
4. Industry Collaboration: This dimension evaluates partnerships with maritime companies and the involvement of industry practitioners in the teaching and learning process.
5. Curriculum and Learning Materials: This dimension measures the relevance of the curriculum to industry needs and evaluates the effectiveness and applicability of the teaching methods used.
6. Evaluation and Quality Assurance: This dimension focuses on evaluation systems for assessing educator performance and student learning outcomes, as well as the implementation of quality audits to maintain and enhance educational standards.

The explanation of points 1 to 6 helps in designing a comprehensive research framework, ensuring that all critical aspects of managing educator and educational personnel standards in maritime vocational education are thoroughly covered. The management of educator and educational personnel standards in maritime vocational education must be based on educator qualifications and competencies, which include formal education, professional experience, and relevant certification and training. Professional development is an essential aspect that should be supported through continuous training programs, seminars, and feedback mechanisms aimed at improving educator quality.

Furthermore, the management and administration of human resources should be conducted systematically, emphasizing selective recruitment processes, well-planned career development, and the provision of adequate infrastructure to support educational activities. Collaboration with the maritime industry is also a key factor, as industry involvement and partnerships with maritime companies enrich the learning process and ensure the relevance of education to the needs of the labor market. The curriculum and learning materials must be continuously aligned with technological developments and industry demands while employing effective and practical teaching methods. Lastly, evaluation and quality assurance should be implemented consistently through systems that measure educator performance and student learning outcomes, along with regular quality audits to maintain and improve the standards of maritime vocational education. With this integrated approach, maritime vocational education can produce competent, professional educators and graduates who are well-prepared to face the dynamic challenges of the maritime industry.

1. Qualifications and Competence

Limited Qualifications: Some educators may lack adequate qualifications or competencies to effectively teach and support the learning process. According to Chapter V of Law of the Republic of Indonesia No. 14 of 2005 on Teachers and Lecturers, lecturers are required to possess a minimum academic qualification of a master’s degree to teach at diploma or undergraduate programs, and a doctoral degree to teach at postgraduate programs. This provision is reaffirmed in Law of the Republic of Indonesia No. 12 of 2012 on Higher Education, particularly Article 21(4), which stipulates that lecturers must have at least a master’s or equivalent qualification to teach in diploma III and diploma IV (applied bachelor’s) programs. These qualifications must be obtained through accredited postgraduate programs relevant to their field of expertise.

In addition to academic qualifications, lecturers must demonstrate professional competence, possess a teaching certificate, be physically and mentally fit, fulfill additional institutional requirements, and uphold the national educational objectives. Under the same law, lecturers and educational personnel are categorized as higher education workforce, appointed and assigned by the government or the institution's governing body under employment agreements consistent with prevailing regulations. Lecturers appointed by the government are typically assigned to public universities (PTN), while private universities (PTS) may also receive government-appointed lecturers, as stated in Article 89.

Further details are provided in Government Regulation No. 37 of 2009 on Lecturers, which specifies the requirements for educator certification. The regulation states that teaching certificates are granted to lecturers who have at least two years of teaching experience in higher education and hold a minimum academic rank of Assistant Expert (Asisten Ahli).

2. Professional Development

Limited Access to Professional Development: The development of educator and educational personnel standards in maritime vocational education faces several challenges, one of the most significant being limited access to training and professional development opportunities. This limitation can significantly hinder the improvement of educators' skills and knowledge. The main challenges include:

- a. **Limited Availability of Training Programs**
Specialized professional development programs in the maritime field are often not widely available. Many of these programs are concentrated in major cities or countries with strong maritime traditions. For educators and staff in remote areas or developing regions, access to such training remains highly restricted.
- b. **High Cost of Training**
Participation in quality training programs, especially those offered by reputable institutions, often requires substantial financial resources. Educators and staff may face financial barriers if their institutions do not allocate sufficient budgets for professional development.
- c. **Lack of Infrastructure**
Supporting infrastructure such as training centers, simulators, and laboratories is not always available. In maritime education, access to advanced equipment and technology is critical for providing realistic and applicable training. Without this infrastructure, the quality of training becomes limited.
- d. **Time Constraints and Availability**
Educators and educational staff often face heavy workloads, including teaching and administrative responsibilities, leaving limited time for professional development. Furthermore, training schedules may not align with their work commitments, reducing participation opportunities.
- e. **Technological Gap**
The integration of technology in maritime vocational education is essential; however, not all educators have access to or proficiency in the latest technologies. This gap may result from insufficient technical training, high equipment costs, or inadequate institutional infrastructure.
- f. **Lack of Institutional Support**
Some educational institutions may lack awareness of the importance of continuous professional development or may not have policies supporting ongoing training for their staff. Without institutional encouragement or funding, educators may lack both motivation and resources to pursue skill enhancement independently.

Management and Administration

The Management and Administration dimension in the context of maritime vocational education encompasses various crucial aspects that ensure educators and educational personnel possess the quality standards required by regulatory and institutional frameworks. Effective management supports the

sustainability and improvement of educational quality through optimal management of human resources and infrastructure. The key variables within this dimension are as follows:

1. Recruitment System

The recruitment system serves as the foundation for managing high-quality human resources. In maritime vocational education, this system must be designed to be selective and transparent, ensuring that recruited educators and educational staff meet the necessary qualifications and competencies aligned with the needs of the maritime sector.

- a. Recruitment Criteria: Include formal educational requirements, work experience in the maritime field, professional certifications, and technical abilities that comply with industry standards.
- b. Selection Process: Should involve objective stages such as competency tests, interviews, and document verification to identify the most qualified candidates.
- c. Alignment with Industry Needs: The recruitment process should adapt to technological advancements and practical demands in the maritime sector to ensure educators can deliver relevant and applicable learning materials.
- d. Impact on Education Quality: A robust recruitment system produces competent educators, directly enhancing the quality of teaching and graduates' readiness for the workforce.

2. Career Development

Career development is a continuous process that supports the improvement of educator and staff competence and professionalism. In maritime vocational education, this process is vital to ensure educators remain updated with the latest scientific knowledge, technological advances, and industry practices.

- a. Training and Workshop Programs: Providing relevant technical training, seminars, and workshops in maritime disciplines to update educators' knowledge and skills.
- b. Evaluation and Feedback Mechanisms: Implementing structured performance evaluation systems to identify development needs and provide constructive feedback.
- c. Clear Career Pathways: Establishing planned career tracks, including promotions and expanded responsibilities, to motivate educators for continuous growth.
- d. Industry Collaboration: Offering opportunities for educators to engage in industry projects or internships at maritime companies to enrich practical experience.
- e. Impact on Educational Standards: Effective career development ensures educators can apply the latest teaching methods and meet the quality standards of vocational education.

3. Infrastructure and Facilities

Infrastructure and facilities represent vital supporting components in maritime vocational education, as this field demands applied and practice-oriented learning.

- a. Specialized Learning Facilities: Include marine laboratories, navigation simulators, ship workshops, and maritime technology equipment to support hands-on training and experimentation.
- b. Modern Technology and Equipment: Utilization of the latest technologies that align with maritime industry standards, providing realistic and relevant learning experiences.
- c. Physical Conditions and Learning Environment: Classrooms, workspaces, and learning environments must be conducive and safe to support effective teaching and learning activities.
- d. Maintenance and Development: Regular maintenance and continuous upgrading of facilities to ensure they remain in optimal condition and up to date with technological developments.
- e. Impact on Learning Quality: Adequate infrastructure enables educators to deliver practical and interactive lessons, producing graduates equipped with job-ready technical skills for the maritime industry.

4. Curriculum and Learning Materials

To ensure that the learning process produces graduates who are competent and ready to meet the demands of the dynamic maritime industry, curriculum design must align closely with current industry needs. One of the main variables within this dimension is the Relevance of the Curriculum to Industry

Needs, which emphasizes the importance of continuously developing and updating the curriculum to reflect advancements in technology, regulations, and operational practices within the maritime sector. A relevant curriculum should include applied content and meet the competency standards required by the labor market, enabling graduates to contribute effectively and immediately to the industry. Furthermore, the Teaching Method variable plays a crucial role in ensuring the effective transfer of knowledge and skills. The teaching methods employed must be interactive, practical, and experience-based, such as the use of navigation simulators, fieldwork, industrial internships, and collaborations with maritime companies. This active and contextual learning approach enhances not only theoretical understanding but also technical proficiency and essential soft skills required in maritime professions. Therefore, integrating a relevant curriculum with appropriate teaching methods serves as a fundamental basis for developing educator and educational personnel standards—ensuring that maritime vocational education produces adaptive, competent, and industry-ready professionals.

Curriculum reform for educators and educational personnel in maritime vocational education is an essential step to maintain alignment with the rapid evolution of the maritime industry. The sector continues to experience swift changes in technology, regulation, and operational practices, thus necessitating regular updates to reflect these developments. The curriculum revision process involves several key stages: industry needs analysis, formulation of educational objectives, development of learning materials, and continuous evaluation and adjustment.

The first stage, industry needs analysis, is a critical step involving consultation with key maritime stakeholders such as shipping companies, government agencies, and professional associations. The goal is to identify the competencies and knowledge required by the current and future workforce. Understanding these needs enables curriculum designers to close the gap between education and industry practice.

The next step is the formulation of educational objectives, which should clearly reflect the competencies demanded by the industry. The curriculum should emphasize the development of essential practical skills such as electronic navigation, maritime safety management, and ship maintenance. In addition, soft skills—including leadership, communication, and problem-solving—must be incorporated, recognizing their importance in the complex and dynamic maritime work environment.

The development of learning materials follows, where teaching resources must be designed to support interactive and application-oriented learning. The use of educational technologies, such as navigation simulators and e-learning modules, can enrich students' learning experiences. Field practices and laboratory sessions should be systematically integrated to provide relevant hands-on experience.

Finally, continuous evaluation and curriculum adjustment are key to ensuring that the curriculum remains up to date. This involves regular reviews of curriculum effectiveness based on feedback from students, educators, and industry representatives. Emerging maritime regulations, new technologies, and evolving industry trends must be promptly incorporated. Additionally, ongoing training and professional development for educators are essential to ensure that they remain prepared to deliver the latest and most relevant material.

Through this comprehensive approach, curriculum reform in maritime vocational education ensures that educators and educational personnel can deliver learning aligned with industry requirements, and that graduates possess the skills and knowledge necessary to make meaningful contributions in the maritime workforce.

5. Evaluation and Supervision

An ineffective performance evaluation system can significantly disadvantage educators and educational personnel in maritime vocational education. When evaluation mechanisms are unfair or fail to accurately reflect teaching quality and contribution, they can lead to frustration, demotivation, and a decline in instructional quality. Furthermore, inaccurate evaluations may undermine confidence and hinder opportunities for professional growth. Therefore, it is essential to design and implement transparent, fair, and performance-oriented evaluation systems that focus on improving the quality of teaching and learning within maritime vocational education. To meet the demand for highly qualified educators, continuous competency enhancement for maritime vocational lecturers must be prioritized.

Improving practical facilities and infrastructure can be achieved through strengthening pentahelix collaboration (involving government, academia, industry, society, and media) and revitalizing vocational education by establishing teaching factories. Curriculum adjustments may also be pursued through rebranding efforts, including direct studies to understand human resource needs in the maritime industry or benchmarking with more advanced educational institutions, both domestically and internationally.

In addition, maritime vocational education must consistently foster character development and soft skills among students. This can be accomplished by inviting personality experts or collaborating with industry representatives—particularly human resource managers to provide students with direct insights into the personal qualities required in the maritime workforce (Hartanto et al., 2019).

Uncertain Supervision and Accountability: Lack of effective supervision and accountability poses a serious challenge to maintaining ethical and performance standards in maritime vocational education. Weak oversight mechanisms can lead to ethical lapses, poor teaching practices, and reduced compliance with institutional and national standards. Without proper monitoring, there is no assurance that educators and educational personnel adhere to established standards potentially compromising educational quality.

This lack of supervision may also foster misuse of authority or institutional resources and hinder efforts toward continuous improvement. Moreover, unsupervised teaching performance may fail to meet professional expectations, directly affecting the competence and job readiness of maritime graduates. To uphold high standards of ethics and professional performance, a robust and transparent supervision and accountability framework must be established. This should include regular evaluations, structured feedback from students, and clear mechanisms for addressing findings and implementing corrective actions. By strengthening these processes, maritime vocational education can ensure that both educators and graduates embody professional integrity and excellence producing a workforce that is competent, ethical, and responsive to the evolving demands of the maritime industry.

The Impact of Limited Access to Training and Professional Development Limited access to training and professional development has both direct and indirect consequences that significantly affect the quality of maritime vocational education. The main impacts include:

a. **Decline in Education Quality:**

Educators who lack sufficient access to training and professional development opportunities may struggle to stay updated with the latest technological and maritime practices. Consequently, this limitation can reduce the quality of instruction delivered to students and hinder innovation in teaching.

b. **Difficulty in Adopting New Technologies:**

Without adequate training, educators and educational staff may face challenges in adopting and implementing new technologies essential to the maritime field—such as electronic navigation systems and ship management technologies. This technological gap limits their ability to provide students with modern and relevant learning experiences.

c. **Career Limitations:**

The absence of professional development opportunities can restrict career advancement for educators and educational staff. It diminishes their prospects for promotion or access to higher positions, leading to stagnation in professional growth.

d. **Motivation and Retention Issues:**

Educators who feel unsupported in their professional development may experience decreased motivation and job satisfaction. Over time, this can result in increased turnover, reducing institutional stability and overall teaching quality.

Addressing these challenges is crucial to enhancing the quality of maritime vocational education and promoting the development of a skilled maritime workforce. Professional development for educators and educational personnel in maritime vocational education faces substantial obstacles, particularly regarding access to training. Specialized training programs are often concentrated in major cities or countries with strong maritime traditions, leaving educators in remote areas or developing nations with limited opportunities. High training costs and inadequate infrastructure further exacerbate the issue. Moreover, heavy workloads and technological disparities limit educators' ability to participate in continuous learning.

This restricted access has detrimental effects on educational quality. Educators without adequate training may struggle to integrate new technologies or adopt best practices, resulting in less effective instruction. Furthermore, it limits career progression and undermines motivation, contributing to higher attrition rates within the teaching profession.

To overcome these challenges, several solutions can be implemented:

1. Increased educational funding and stronger partnerships with the maritime industry can provide practical, technology-oriented training opportunities.
2. Online training platforms can serve as flexible and accessible alternatives, allowing broader participation.
3. Scholarships and financial assistance programs dedicated to professional development can alleviate financial barriers for educators.

By addressing these issues, the overall quality of maritime vocational education can be enhanced, contributing positively to the advancement of the maritime sector as a whole. Misalignment between professional development programs for educators and educational personnel and the actual needs of the education and maritime industry represents a significant challenge. Such discrepancies can hinder the effectiveness of the teaching process and reduce students' readiness to enter the maritime workforce.

The issue can be elaborated through several key aspects:

- a. **Rapid Changes in the Maritime Industry**
The maritime industry is evolving rapidly with continuous technological and regulatory transformations. Modern navigation systems, automated ship technologies, and new safety regulations are examples of developments that educators and educational personnel must keep up with. Professional development programs that fail to reflect these changes result in educators being unable to deliver current and relevant material to their students.
- b. **Industry-Specific Needs**
Each sector of the maritime industry has distinct requirements, such as navigation, ship management, maritime safety, and marine technology. Generic or non-specialized professional development programs that do not address these specific needs tend to be ineffective. For instance, training focused solely on general management may not adequately support educators teaching electronic navigation or marine engineering.
- c. **Lack of Industry Involvement in Curriculum Development**
One of the main causes of misalignment is the lack of maritime industry involvement in designing curricula and training programs. Without input from industry stakeholders, training initiatives often fail to meet labor market demands. Industry collaboration is essential to ensure that professional development programs equip educators with the practical skills and knowledge needed in real-world maritime operations.
- d. **Outdated Teaching Methodologies**
Teaching methodologies must evolve in line with advancements in modern pedagogy and educational technology. Professional development programs that do not include updates in instructional methods lead educators to rely on outdated and less effective approaches. This can reduce student engagement and comprehension, ultimately diminishing learning outcomes.
- e. **Lack of Focus on Practical Skills**
The maritime field requires strong practical competencies. Professional development programs that are overly theoretical and fail to emphasize hands-on skills produce educators who struggle to provide students with meaningful and applicable learning experiences. Skills such as ship maneuvering, navigation equipment operation, and emergency response are essential in maritime vocational education and must be integrated into training initiatives.

CONCLUSIONS

Changes in the standards for educators and education personnel in maritime vocational education are crucial to ensure that the education provided remains relevant to industrial developments. The maritime industry is rapidly evolving in terms of technology, regulations, and operational practices;

therefore, the standards applied to educators and education personnel must be continuously updated to reflect these advancements. This process involves several stages, starting from analyzing industry needs, formulating educational objectives, developing teaching materials, to conducting ongoing evaluation and adjustment. From the discussion above, it can be identified that there are qualification and competency challenges. Some educators and education personnel may not possess adequate qualifications or competencies to teach or support the learning process effectively. Curriculum and information and communication technology (ICT) changes also present challenges, as qualification standards may not always be responsive to curricular updates or technological progress. Ineffective evaluation processes such as unfair or poorly designed performance assessment systems can disadvantage educators and staff. Uncertain supervision and a lack of accountability can result in declining ethical and performance standards. Limited access to training and professional development further hampers the enhancement of skills and knowledge. Misalignment between development programs and the needs of the educational and industrial sectors may also create significant obstacles. Therefore, continuous training and professional development for educators are essential to ensure that they remain capable of teaching the latest materials. With a comprehensive approach, changes in the standards for educators and education personnel in maritime vocational education can ensure that graduates possess the skills and knowledge aligned with industry needs—thus preparing them to contribute effectively in the professional maritime world.

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to Politeknik Bumi Akpelni, the Institute for Research and Community Service (LPPM) of Politeknik Bumi Akpelni for their valuable suggestions and support in this research, which made it possible for this study to be successfully conducted and completed.

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