

Competency Assessment of Maritime Instructors and Assessors of a Training Center: Basis for Continuing Development Training Plan (CDTP)

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Abstract—This study assessed the competency levels of maritime instructors and assessors at VMA Training Center as a basis for developing a Continuing Development Training (CDT) plan. Using a cross-sectional survey design, data were collected from 168 trainees across seven batches who evaluated 7 instructors and 7 assessors using a researcher-made, expert-validated 5-point Likert questionnaire based on IMO Model Courses 6.09 and 3.12. Results showed that instructors demonstrated Very High competency in pedagogical techniques ($M = 4.21$, $SD = 0.40$) and High in communication ($M = 3.88$, $SD = 0.53$), while assessors showed High competency in assessment skills ($M = 4.06$, $SD = 0.69$) and communication ($M = 3.58$, $SD = 0.76$). However, technological adaptability was rated only Average for both groups (instructors: $M = 3.29$; assessors: $M = 3.28$), emerging as the clearest development priority. Based on these findings, a six-module CDT plan was formulated, with a critical distinction between onsite digital skills (applicable to all courses) and LMS-based delivery (restricted to ODL-accredited courses per MARINA SC-2021-10). Stakeholder evaluation by a MARINA panel expert, the training director, and an industry practitioner confirmed the plan's relevance, practicality, and alignment with international standards.

Index Terms—assessment skills, competency-based education, continuing development training, maritime education, pedagogical techniques, technological adaptability.

1. Introduction

A. Background of the Study

Maritime trade is the backbone of the global economy, with international shipping accounting for over 80% of global trade [1]. The COVID-19 pandemic further underscored the sector's indispensability, as port closures and crew-change disruptions severely disrupted global supply chains [2]. This necessitates the rigorous training and certification of maritime professionals to minimize shipping accidents, reduce economic losses, and sustain global operational continuity.

Central to maritime education is competency assessment, which ensures that instructors and assessors meet internationally recognized standards for training seafarers. The International Maritime Organization (IMO) sets these global

benchmarks through conventions and model courses, most notably IMO Model Course 6.09 on teaching methodologies and IMO Model Course 3.12 on competency assessment methods [4], [5]. These align with the Standards of Training, Certification, and Watchkeeping for Seafarers (STCW '78), as amended [3], ensuring compliance with international safety, environmental, and operational standards. The Revised Rules on the Accreditation of Instructors and Assessors mandate that a competent assessor must possess appropriate knowledge, skills, and accreditation, including practical sea-going experience and specific training in assessment methods [6].

Continuing Development Training (CDT) for maritime instructors and assessors is therefore mandated to maintain and update professional competence in line with current industry standards and policies. MARINA Circular No. SC-2024-01 highlights that CDT covering assessment ethics, methodologies, teaching methods, and emerging maritime technologies is essential for maintaining quality standards in maritime training institutions and must be integrated into each institution's quality management system [6].

The Philippines supplies approximately 25% of the world's maritime workforce, making it a global leader in seafarer deployment [7]. Despite this prominence, significant challenges persist. Estimo [8] identified that many maritime educators are sea-going professionals who, while rich in practical experience, lack formal pedagogical training—creating inconsistencies in instructional delivery and competency assessment standards. Daiz and Garcia [9] found that maritime instructors face challenges such as financial constraints, limited resources, and fatigue, all of which diminish teaching efficacy. Derecho [10] additionally noted that practical assessment is hampered by student-related factors, inadequate facilities, and policy-related obstacles.

Scrutiny from international bodies has intensified these concerns. Past audits by the European Maritime Safety Agency (EMSA) raised concerns about the monitoring and evaluation of maritime training institutions in the Philippines [11]. Baldevarona et al. [12] further highlighted that insufficient

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alignment between instructor competencies and evolving industry demands, compounded by gaps in continuing professional development, represents a critical vulnerability in the nation's maritime education system.

Given the foregoing, the need to conduct a formal competency assessment of maritime instructors and assessors at VMA Training Center is both timely and compelling. While policy mandates and international standards exist, research at the institutional level remains limited. A targeted competency assessment is the necessary first step: it generates context-specific data that can inform a structured CDT plan tailored to VMA Training Center's instructors, thereby elevating the quality of maritime education, reinforcing compliance with national and international standards, and ultimately contributing to the production of competent, globally competitive Filipino seafarers.

B. Statement of the Problem

This study aimed to assess the specific needs that must be considered in developing a CDT plan for maritime instructors and assessors at VMA Training Center. Specifically, it sought to answer the following:

1. What is the level of competency of the instructors in pedagogical techniques, communication, and technological adaptability?
2. What is the level of competency of the assessors in assessment skills, communication, and technological adaptability?
3. Is there a significant difference in the level of competency of instructors by batch?
4. Is there a significant difference in the level of competency of assessors by batch?
5. Based on the results, what CDT plan can be formulated?
6. What is the evaluation of the CDT plan by the stakeholders?

The following null hypotheses were tested: (1) There is no significant difference in the level of competency of instructors by batch; and (2) There is no significant difference in the level of competency of assessors by batch.

C. Theoretical Framework

This study is anchored on two complementary theoretical frameworks. The primary lens is Malcolm Knowles's Theory of Andragogy [13], which describes the distinct characteristics of adult learners and prescribes how educational programs should be designed to meet their needs. Knowles identified six core principles: self-concept, experience, readiness to learn, orientation to learning, need to know, and intrinsic motivation. Applied to this study, Andragogy provides the conceptual basis for understanding how maritime instructors and assessors—who are experienced maritime professionals themselves—approach professional development. Their existing sea-going and instructional experience serves as a critical learning resource that CDT programs must acknowledge and build upon.

The second theoretical foundation is Competency-Based Education (CBE) Theory [14], which emphasizes the

demonstration of mastery of defined knowledge, skills, and attitudes rather than time spent in instruction. In the context of this study, CBE provides the operational framework for conducting the competency assessment itself and for translating its results into a CDT plan. The competencies of maritime instructors and assessors are evaluated against clearly defined international benchmarks set by IMO Model Courses 6.09 and 3.12 [4], [5] and MARINA Circular No. SC-2024-01 [6]. Together, CBE defines what competencies must be achieved, while Andragogy prescribes how adult learners best develop those competencies.

D. Scope and Limitation

This study sought to identify the competencies of VMA Training Center instructors and assessors as perceived by trainees during February 2026 at VMA Global College and Training Centers, Inc., Bacolod City. The participants were 168 trainees (7 batches), 7 instructors, 7 assessors, and 3 key informants who evaluated the proposed CDT plan. To ensure data triangulation, each instructor and assessor conducted a self-evaluation. The mean, standard deviation, and one-way ANOVA were utilized for data analysis. The respondents are already deemed competent per MARINA standards, as evidenced by their Certificates of Accreditation; this assessment is therefore limited to internal profiling for institutional CDT development.

E. Significance of the Study

The findings benefit VMA Training Center by providing a tailored CDT framework aligned with international standards. Instructors and assessors gain opportunities for continuing professional development, keeping them updated with technological advancements, regulatory changes, and pedagogical methodologies. Trainees receive higher-quality education and training, reducing the risk of accidents and enhancing career prospects. MARINA benefits through support for its mandate to harmonize national training programs with international standards. Other maritime training institutions may adopt the framework as a model, and future researchers may build upon the findings.

2. Review of Related Literature

A. Importance of CDT in Maritime Education

CDT programs are vital components of maritime education, anchored in IMO Model Courses 6.09 and 3.12 [4], [5]. As the maritime sector increasingly integrates digital technologies virtual reality, augmented reality, and e-learning instructors must continuously upgrade their skills [19]. Sharma and Nazir (2021) found that while many maritime instructors demonstrate awareness of technological tools, significant variation exists in actual proficiency, underscoring the need for structured technology-focused CDT. Effective implementation often faces challenges such as limited resources, resistance to change, and technostress [20], [21].

At the national level, MARINA Circular No. SC-2024-01 mandates periodic refresher training for instructor and assessor competencies [6]. The National Maritime Polytechnic [32]

emphasized the need for structured training in resource-constrained settings, and Loh, Yuen, and Tan (2022) found that pedagogy ranked highest in importance among core competencies expected from maritime educators in the digital era [33].

B. Competency Standards and Assessment Frameworks

The STCW Convention serves as the primary regulatory framework governing seafarer competencies [3]. Gundić *et al.* [26] provided a comprehensive analysis of the STCW Convention's competency demonstration methods, noting that every maritime education and training (MET) institution must incorporate minimum standards while drawing on IMO Model Courses for supplementary guidance. Vujičić *et al.* [21] found that IMO model course training significantly enhances instructor effectiveness and that ongoing professional development is strongly associated with improved instructional quality.

Baldevarona *et al.* [12] found that higher instructor competency significantly correlates with enhanced industry preparedness of maritime students. Fan [28] analyzed seafarer competency assessment methods in China, revealing that management systems involving multiple stakeholders enhance the reliability and effectiveness of competency evaluations. Ghosh, Emad, and Ravi [27] identified that future seafarers operating smart ships will require competencies beyond those currently prescribed, reinforcing the urgency of regular competency assessment.

C. Challenges in Maritime Training Practices

Bao *et al.* [20] found that technology integration and updated teaching methods are frequently hindered by resource constraints and infrastructure limitations. Vujičić *et al.* [21] noted inadequate focus on structured feedback loops to enhance instructional methods. Meštrović *et al.* [22] revealed that the roles of instructors and seafarers are shifting significantly, yet curricula and institutional capacity lag behind. Lee *et al.* [23] identified challenges specific to the post-pandemic context, where sustainable integration of online approaches requires addressing technological gaps and building instructor capacity for digital delivery.

D. Strategies for Enhancing CDT Programs

Research underscores the need for tailored CDT programs to bridge gaps in technology integration, standardization, and feedback mechanisms. Collaborative training programs developed through partnerships between institutions and industry stakeholders have emerged as effective strategies. Dayagbil and Alda [24] demonstrated that needs-based CPD activities are perceived as more effective by teachers in improving instructional competence.

E. Measuring CDT Effectiveness

Ensuring CDT effectiveness requires multi-faceted assessment through classroom observations, peer reviews, and self-assessments. Shiri *et al.* [25] confirmed that participation in structured professional training is associated with increased intention to remain in current roles, higher job satisfaction, and

sustained competency levels. Institutional achievement indicators include adherence to international standards, accreditation by MARINA and CHED, and feedback mechanisms that help refine program delivery.

F. Synthesis

The literature consistently affirms that instructor competency is central to maritime education quality. However, institution-specific competency assessments that directly inform targeted CDT plans remain scarce in the Philippine context. This gap constitutes the primary rationale for the present study: by conducting a formal competency assessment at VMA Training Center and using its findings as the basis for a CDT plan, this study directly responds to the need for evidence-based, institution-specific professional development frameworks.

3. Methodology

A. Research Design

This study used the cross-sectional survey research design, an observational method where data is collected from a population at a single point in time to assess the prevalence of outcomes, characteristics, or relationships among variables [15]. This design was appropriate as it assessed the significant differences in competency of maritime instructors and assessors as evaluated by trainees without influencing the variables.

B. Respondents

The participants were 168 trainees comprising 7 batches who evaluated their instructors and assessors, 7 instructors and 7 assessors who evaluated their own competency for data triangulation, and 3 key informants who evaluated the proposed CDT plan. The key informants were purposively selected: Capt. Daniel Estrabon, PhD (MARINA Panel of Experts), C/E Teopisto Dum Dumaya, Jr. (Training Director, VMA), and 2/M Felix Bajala (active seafarer and trainee).

Table 1
Distribution of respondents

Batch	N	%
Batch 1	24	14.3%
Batch 2	24	14.3%
Batch 3	24	14.3%
Batch 4	24	14.3%
Batch 5	24	14.3%
Batch 6	24	14.3%
Batch 7	24	14.3%
Total	168	100%

C. Research Instrument

The study utilized a researcher-made questionnaire based on IMO Model Course 6.09 (for instructors) and IMO Model Course 3.12 (for assessors) [4], [5]. The instrument measured competency using a 5-point Likert scale: Very High (4.20–5.00), High (3.40–4.19), Average (2.60–3.39), Low (1.80–2.59), and Very Low (1.00–1.79). The questionnaire underwent content validation by 5 maritime experts using Lawshe's Content Validity Ratio, and reliability testing using Cronbach's Alpha at another maritime training institution.

For the evaluation of the proposed CDT plan, a stakeholder

evaluation sheet was used to gather qualitative feedback. Stakeholders responded to the guiding question: "Based on your expertise and experience, what are your comments, insights, and recommendations regarding the relevance, applicability, and effectiveness of the proposed CDT plan?"

D. Data Gathering Procedure

After establishing validity and reliability, letters requesting permission were sent to the Vice-President for VMA Training Center and the Training Director. Once approved, the researcher scheduled meetings with respondents to complete the survey questionnaire, explaining the study's objectives beforehand. The proposed CDT plan was then presented to the three stakeholders through a consultation process, with each receiving a copy and sufficient time to review and provide qualitative feedback.

E. Statistical Treatment

To answer Problems 1 and 2, the mean and standard deviation were used to determine the level of competency. To answer Problems 3 and 4, one-way ANOVA was used to test for significant differences across batches. For the stakeholder evaluation (Problem 6), qualitative analysis was employed since respondents answered a single open-ended question.

F. Ethical Considerations

Survey questionnaires were coded and securely stored with access restricted to the researcher. Respondents were assured of anonymity and confidentiality. Upon the study's conclusion, all collected questionnaires were shredded to ensure complete protection of respondent information.

4. Results and Discussion

A. Level of Competency of Instructors

Table 2 presents the overall competency levels of instructors. Pedagogical techniques were rated Very High ($M = 4.21$, $SD = 0.40$), communication High ($M = 3.88$, $SD = 0.53$), and technological adaptability Average ($M = 3.29$, $SD = 0.73$).

Table 2
Overall competency levels of instructors

Competency	Mean	SD	Description
Pedagogical Techniques	4.21	0.40	Very High
Communication	3.88	0.53	High
Technological Adaptability	3.29	0.73	Average

The highest-rated competency was pedagogical techniques, indicating that instructors consistently demonstrate strong mastery in lesson delivery, organization, and facilitation. Communication ranked second, suggesting effectiveness in conveying ideas and engaging trainees. However, technological adaptability obtained the lowest mean and was interpreted as Average, highlighting a gap in the use of digital tools and innovative teaching technologies, an increasingly important area in modern maritime education.

B. Level of Competency of Assessors

Table 3 presents the overall competency levels of assessors. Assessment skills were rated High ($M = 4.06$, $SD = 0.69$),

communication High ($M = 3.58$, $SD = 0.76$), and technological adaptability Average ($M = 3.28$, $SD = 0.81$).

Table 3
Overall competency levels of assessors

Competency	Mean	SD	Description
Assessment Skills	4.06	0.69	High
Communication	3.58	0.76	High
Technological Adaptability	3.28	0.81	Average

Assessors demonstrated strong assessment competencies, particularly in ensuring clear instructions for written assessments ($M = 4.59$) and explaining the purpose of assessments ($M = 4.50$). However, the use of fair and consistent criteria in rating performance received the lowest mean ($M = 3.46$), indicating a need for standardization. Technological adaptability was again the weakest area, with limited use of digital assessment tools and inconsistent application of technology during assessment processes.

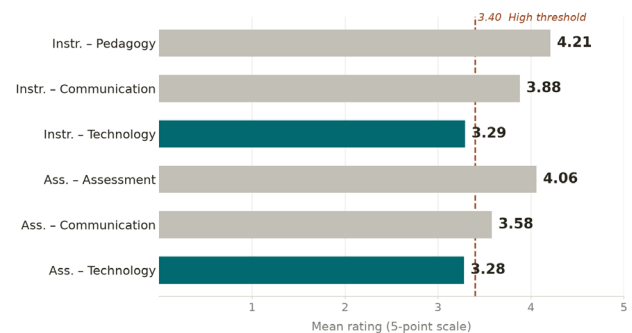


Fig. 1. Comparison of competency levels across instructor and assessor domains

C. Identification of the Competency Gap

The results reveal a consistent pattern: while pedagogical, assessment, and communication competencies are strong, technological adaptability falls to Average for both instructors ($M = 3.29$) and assessors ($M = 3.28$) below the 3.40 threshold for High competency. This gap is not merely about advanced digital tools; it includes basic presentation skills (PowerPoint, projectors, multimedia) that affect even onsite training delivery. Additionally, critical thinking facilitation and adaptive communication among assessors require strengthening.

These findings directly inform the design of the CDT plan: areas rated High and above receive maintenance-level interventions, while areas at Average and below receive focused, intensive training modules.

D. Proposed Continuing Development Training (CDT) Plan

Based on the assessment findings, a six-module CDT plan was formulated under the theme "Enhancing Instructional, Assessment, and Technological Competencies through Digital and Standards-Based Training." A critical design principle distinguishes two digital tracks:

1) Module 1: Onsite Digital Adaptability (ALL courses)

This module addresses basic digital skills applicable to all training programs, including onsite delivery. It covers PowerPoint operations, projector use, multimedia integration, simulations, and interactive lesson design. The focus is on

equipping instructors and assessors with fundamental digital presentation and instructional technology skills that enhance even traditional classroom-based training.

2) Module 2: LMS-Based Course Delivery (ODL courses ONLY)

This module is restricted to Online Distance Learning (ODL)-accredited courses under MARINA Circular SC-2021-10 [29]. It covers LMS platforms for course delivery, tracking, and assessment; online conferencing tools (Zoom, MS Teams); and distance and blended-learning strategies. This module is presented separately from Module 1 because LMS-based delivery requires a distinct skill set and applies only to courses with ODL accreditation.

3) Modules 3–6: Reinforcing Existing Strengths and Addressing Secondary Gaps

Module 3 (Technology-Integrated Assessment) covers digital assessment tools within LMS, online/hybrid assessments, and ensuring fairness in digital assessments. Module 4 (Communication and Facilitation) addresses critical thinking facilitation, adaptive communication, and feedback strategies. Module 5 (Assessment Standardization) focuses on rubric development, calibration sessions among assessors, and feedback mechanisms. Module 6 (Sustaining Strengths) provides maintenance-level refresher training on IMO 6.09 and 3.12 competencies where instructors and assessors already perform well.

Table 4
CDT plan module summary

Module	Focus	Applies To
M1	Onsite Digital Adaptability	ALL courses
M2	LMS-Based Delivery	ODL only
M3	Technology-Integrated Assessment	ALL courses
M4	Communication & Facilitation	ALL courses
M5	Assessment Standardization	ALL courses
M6	Sustaining Strengths	ALL courses

E. Evaluation of the CDT Plan by Stakeholders

The proposed CDT plan was presented to three stakeholders for qualitative evaluation. Capt. Daniel Estrabon, PhD, a member of the MARINA Panel of Experts, emphasized that the plan is well-structured and that the inclusion of competencies from IMO Model Courses 6.09 and 3.12 significantly strengthens the program. He noted that reinforcing these competencies ensures compliance with international requirements and supports continuous professional development.

C/E Teopisto Dum Dumaya, Jr., Training Director of VMA Training Center, highlighted the strategic value of the plan in institutional development. He stated that the integration of LMS, online conferencing, and distance learning strategies directly supports compliance with MARINA Circular SC-2021-10 governing ODL implementation [29]. He emphasized that adopting the plan will enhance instructional delivery and strengthen the institution's capability to secure and sustain ODL accreditation.

2/M Felix Bajala, an active seafarer and trainee, provided the industry perspective. He expressed that the integration of technology would make training more accessible, especially for

seafarers with limited time or who are geographically distant. He emphasized that interactive, technology-enhanced learning approaches would make training more engaging and aligned with actual onboard practices.

Overall, the stakeholder evaluation confirmed that the CDT plan is relevant, practical, and aligned with both institutional goals and international maritime standards.

5. Conclusion

A. Conclusions

Based on the findings, the following conclusions are drawn:

1. Maritime instructors possess Very High competency in pedagogical techniques, indicating strong ability in lesson organization and content delivery. However, their technological adaptability is only Average, highlighting a gap in integrating digital tools.
2. Maritime assessors demonstrate High competency in assessment skills and communication. Nevertheless, consistency in assessment practices and technology use require improvement.
3. Technological adaptability is the weakest competency for both groups, requiring focused intervention.
4. The proposed CDT plan is responsive to identified needs, emphasizing technology integration, enhancement of instructional and assessment competencies, and alignment with IMO Model Courses 6.09 and 3.12.
5. Stakeholder evaluation confirms the plan's relevance, practicality, and potential effectiveness.

B. Implications

The identified gap in technological adaptability implies that maritime training institutions must prioritize digital transformation. The integration of LMS, online conferencing, and distance learning is essential for ODL-accredited courses, while basic digital presentation skills must be strengthened across all training programs, including onsite delivery. The strong competencies in pedagogy and assessment must be sustained through continuous professional development. The alignment with IMO Model Courses and MARINA standards ensures that training institutions produce competent maritime professionals meeting global requirements.

C. Recommendations

1. Maritime training institutions should implement the proposed CDT plan to enhance competencies, particularly technological adaptability.
2. Institutions should invest in digital infrastructure, including LMS platforms, online conferencing tools, and simulation technologies.
3. Regular training programs should reinforce competencies aligned with IMO Model Courses 6.09 and 3.12.
4. Standardized assessment practices, including rubric development and calibration sessions, should be implemented.
5. Instructors and assessors should engage in continuous

professional development to keep pace with technological advancements.

6. Institutions should strengthen partnerships with regulatory bodies and industry stakeholders.
7. Future researchers should study the long-term effectiveness of the CDT plan and explore additional strategies for maritime education enhancement.

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