

Multiliteracy Pedagogy and Critical Literacy Formation in Sea Transportation Communication Training

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ARTICLE INFO

Article history:

Received 24 Jul 2025;
in revised form 15 Aug 2025;
accepted 18 Oct 2025.

Keywords:

multiliteracy pedagogy; critical literacy; sea transportation communication in English; vocational maritime education; functional linguistics.

ABSTRACT

Vocational sea transportation programs continue to treat communicative competence as a matter of vocabulary accuracy and phraseology recall, an approach that leaves cadets unprepared for the interpretive demands of multinational crew environments. This study investigates how multiliteracy pedagogy shapes critical literacy development among cadets training for sea transportation communication in English. Using a qualitative design, the research draws on data from 72 cadets across Amanjaya Maritime Institute, Djadayat Maritime Institute, and Malahayati Sea Transportation Institute, applying thematic analysis, cross-group comparison, and narrative synthesis to interpret cadet and instructor perspectives. Findings show that authentic materials, task-based activities, and critical analysis exercises jointly produce literacy gains that conventional instruction does not reach, particularly in cadets' capacity to question institutional authority embedded in communication protocols and to adapt register across cultural contexts. The study identifies empowerment of professionalism as the central outcome, positioning multiliteracy pedagogy as a mechanism for workforce readiness rather than a supplementary language exercise. The research contributes a contextually grounded account of multiliteracy pedagogy within Indonesian maritime vocational education and offers a basis for curriculum reform across comparable institutions.

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1. Introduction.

A cadet who can recite a boarding checklist without error can still misread the situation that checklist was written for. This gap between procedural fluency and interpretive competence sits at the center of a persistent tension in vocational sea transportation education: institutions train cadets to reproduce fixed communicative forms, yet the environments cadets enter after graduation demand something else entirely. Commercial shipping today routes crews from a dozen national backgrounds through a single vessel, compresses decision-making windows during emergencies, and layers technical, regulatory, and interpersonal communication into single exchanges that no

phrasebook anticipates. When cadets encounter situations that fall outside standardized scripts, the limits of a vocabulary-first training model become visible, often at the moment competence matters most.

This tension is not new to language education broadly, but it carries distinct weight in maritime vocational contexts because communication failure there is rarely abstract. Ahmmed et al. (2020) found that Bangladeshi seafarers identified persistent gaps between the communicative skills their training emphasized and the skills their shipboard duties actually required, a mismatch that surfaced most sharply in situations involving negotiation, clarification, and cross-cultural interpretation rather than routine reporting. Mokhtari and Maouche (2023) documented a comparable pattern among instructors at a maritime training institution in Algeria, who described their curricula as oriented toward vocabulary transmission at the expense of the interpretive skills cadets needed once aboard. Aeni et al. (2018) reached a similar conclusion in the Indonesian context, arguing

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that existing materials for general communication training in maritime academies underrepresented the situational and pragmatic dimensions of professional exchange. Across these studies, drawn from different national settings, a consistent picture emerges: vocational sea transportation communication training has historically prioritized linguistic accuracy over the critical and interpretive capacities that professional practice actually demands.

The broader field of applied linguistics has already developed conceptual tools for addressing exactly this kind of gap, though these tools remain underapplied in maritime vocational contexts specifically. Cope and Kalantzis (2015) introduced multiliteracies pedagogy as a direct response to the inadequacy of print-based, single-mode literacy instruction for learners operating in linguistically and culturally diverse, multimodal environments. Their framework rests on the premise that meaning - making today draws on multiple modes and multiple cultural repertoires simultaneously, and that literacy education must therefore move beyond decoding text to include situated practice, overt instruction, critical framing, and transformed practice. Kulju et al. (2018), reviewing multiliteracies pedagogy across primary classrooms, found consistent evidence that this four - part structure produces stronger engagement and more transferable skills than conventional literacy instruction, though they also noted that most empirical application remained concentrated in general education rather than vocational or professional training contexts. This concentration gap matters directly for the present study, since sea transportation communication training sits precisely in the professional vocational space that multiliteracies research has left comparatively unexamined.

Critical literacy provides the second conceptual anchor this study requires, and it addresses a dimension that vocabulary-focused training cannot reach by design. White and Cooper (2015) define critical literacy as the capacity to interrogate the assumptions, power relations, and institutional interests embedded within texts and communicative situations, rather than treating those situations as neutral vehicles for information transfer. Street (2013) and Gee (2023), writing from the New Literacy Studies tradition, extend this argument by framing literacy itself as a social practice inseparable from the contexts and power structures in which it occurs, not a portable technical skill that transfers uniformly across settings. Chakrabarty (2020) synthesizes this tradition's central claim succinctly: literacy education that ignores the social and institutional dimensions of text produces learners who can process language without being able to question it. For a cadet standing on a bridge or working a port operation, this distinction is not academic. A safety directive, a customs instruction, or a distress communication each carries institutional authority, urgency, and cultural assumption that a critically literate professional must recognize in real time, and a professional trained only to decode vocabulary has no framework for that recognition.

Functional linguistics supplies the theoretical bridge between these literacy concepts and the specific communicative demands of sea transportation work. Bloor and Bloor (2013) and Fontaine and McCabe (2023) describe language, within the Hallidayan functional tradition, as a resource organized around the making

of meaning in context rather than a fixed rule system to be applied uniformly. Register shifts according to field, tenor, and mode, meaning the same underlying vocabulary performs differently depending on whether a cadet is logging a routine entry, negotiating a port procedure, or issuing an emergency instruction. This functional view of language explains why communicative competence cannot be reduced to phraseology mastery: the same phrase carries different weight and different interpretive demands depending on the situation surrounding it, and a training model built around fixed forms cannot account for that variability. Llosa (2016) makes a related point in discussing the assessment of content knowledge alongside language proficiency, arguing that language competence and domain competence are functionally intertwined rather than separable, a claim with direct relevance for vocational training where professional judgment and linguistic judgment operate together.

Despite the conceptual maturity of both multiliteracies pedagogy and critical literacy theory, and despite consistent empirical evidence from adjacent maritime training contexts that vocabulary-centered instruction underserves professional communicative needs, no substantial body of research has applied multiliteracy pedagogy directly to sea transportation communication training as a vocational discipline. Existing multiliteracies research clusters around general and secondary education (Kulju et al., 2018), intercultural exchange programs in higher education, and EFL settings not specifically oriented toward professional maritime practice. Existing maritime communication research, meanwhile, has concentrated on needs analysis and curriculum gap identification (Ahmmed et al., 2020; Mokhtari & Maouche, 2023; Pranckevičiūtė, 2019) without extending into pedagogical intervention grounded in multiliteracies or critical literacy frameworks. This leaves a clear conceptual and empirical gap: the field understands, in general terms, that vocational sea transportation communication training needs to move beyond vocabulary instruction, and it separately understands how multiliteracy pedagogy might accomplish that move in other educational settings, but it has not yet tested that pedagogy within the specific institutional and professional conditions of maritime vocational education.

This study addresses that gap directly. It investigates how multiliteracy pedagogy, implemented through authentic materials, task-based activities, and critical analysis exercises, shapes the development of critical literacy among cadets training in sea transportation communication in English. The research draws on qualitative data from 72 cadets across three institutions, Amanjaya Maritime Institute, Djadayat Maritime Institute, and Malahayati Sea Transportation Institute, allowing the findings to reflect patterns across distinct institutional contexts rather than resting on a single program's particular culture or resources. The central research questions guiding this inquiry ask, first, how multiliteracy pedagogy influences cadets' development of critical literacy skills beyond conventional language proficiency, and second, how this pedagogical approach relates to cadets' broader professional readiness within a globalized maritime labor market.

The significance of this study operates on three levels. Theoretically, it extends multiliteracies and critical literacy frame-

works into a vocational domain where they remain largely untested, contributing an empirical account of how these frameworks function under professional rather than general educational conditions. Empirically, it responds directly to the gap identified in needs-analysis studies from Indonesia, Bangladesh, and Algeria, offering an intervention-oriented account where previous research has largely stopped at problem identification. Practically, the study speaks to institutional decision-makers responsible for curriculum design across maritime vocational education, offering evidence relevant to the question of whether multiliteracy pedagogy warrants integration into core training rather than treatment as supplementary enrichment. Given the accelerating diversity of crew composition in global shipping and the corresponding rise in communicative complexity aboard vessels and within ports, the case for reconsidering how sea transportation communication training approaches literacy is not simply an academic one. It is a workforce readiness question with direct consequences for the professionals these institutions send into the field.

The remainder of this paper proceeds as follows. The literature review develops the conceptual and theoretical foundation in greater depth, situating multiliteracies pedagogy, critical literacy, and functional linguistics in relation to one another and to the specific demands of maritime vocational training. The method section details the qualitative design, participant selection, and analytical procedures used across the three institutions. The results and analysis section presents the study's thematic findings, followed by a discussion that interprets these findings against the literature and theoretical framework established here. The paper closes with implications for institutional practice and policy, a concise conclusion, and a full reference list.

2. Literature or Theoretical Review.

2.1. Multiliteracy Pedagogy as Conceptual Framework.

Multiliteracy pedagogy originates in the recognition that literacy education organized solely around printed, monolingual, single-mode text cannot account for how meaning is actually made in contemporary, globalized, and technologically mediated environments. Cope and Kalantzis (2015) formalized this position through a four-part pedagogical structure: situated practice, which immerses learners in authentic communicative contexts; overt instruction, which makes underlying conventions and structures explicit; critical framing, which asks learners to interrogate the social and institutional purposes behind texts; and transformed practice, which requires learners to apply their understanding productively in new contexts. This structure distinguishes multiliteracy pedagogy from earlier communicative approaches by insisting that critical framing is not optional enrichment but a structural requirement of the model itself. A curriculum that offers authentic materials and task-based activities without critical framing, in this account, has not implemented multiliteracy pedagogy in full; it has adopted its surface features while omitting the component responsible for its distinctive contribution to learner development.

Subsequent research has tested and extended this framework across varied educational settings, generating a body of findings that, taken together, both support and complicate the original model. Kulju et al. (2018), synthesizing multiliteracies research across primary classrooms, found the pedagogy consistently associated with stronger learner engagement and more transferable literacy skills compared to conventional instruction, but they also observed that implementation quality varied considerably, with critical framing frequently underdeveloped relative to the other three components. This finding carries particular relevance for vocational contexts, where time constraints and assessment pressures can push instruction toward the more easily measured components of situated practice and overt instruction while critical framing, harder to standardize and assess, receives less structured attention. Maley (2015) and Maley and Kiss (2017) approach a related concern from the standpoint of creativity in language teaching, arguing that authentic and task-based materials achieve their full pedagogical value only when learners are given genuine interpretive latitude rather than guided toward a single correct reading, a claim that aligns closely with the critical framing component Cope and Kalantzis identify as central.

2.2. Critical Literacy and the New Literacy Studies Tradition.

Critical literacy theory supplies the interpretive depth that distinguishes multiliteracy pedagogy from communicative language teaching more broadly. White and Cooper (2015) define critical literacy as the capacity to read texts and situations for the power relations, assumptions, and institutional interests embedded within them, treating literacy as an inherently political practice rather than a neutral technical skill. This position draws directly on the New Literacy Studies tradition established by Street (2013), who argued against what he termed an "autonomous" model of literacy, in which reading and writing are treated as context-independent cognitive skills, in favor of an "ideological" model that understands literacy practices as always embedded in specific social and institutional contexts. Gee (2023) extends this argument by distinguishing between primary discourses, acquired through early socialization, and secondary discourses, acquired through participation in specific institutions and professional communities; professional communicative competence, in this account, requires explicit access to the secondary discourse of the profession in question, access that vocabulary-focused instruction alone does not reliably provide. Chakrabarty (2020) situates these positions within a broader theoretical lineage, noting that New Literacy Studies scholarship converges on the claim that literacy education which brackets out social and institutional context produces technically competent but critically underprepared learners, a claim with direct bearing on vocational training models built around standardized phraseology.

2.3. Functional Linguistics and the Register Demands of Professional Communication.

Functional linguistics provides the theoretical mechanism connecting multiliteracy pedagogy and critical literacy theory

to the specific linguistic demands of sea transportation communication. Bloor and Bloor (2013), working within the Hallidayan systemic functional tradition, describe language as organized around three interacting functions: the ideational function, concerned with representing experience and content; the interpersonal function, concerned with enacting relationships and stance; and the textual function, concerned with organizing information into coherent, situationally appropriate discourse. Fontaine and McCabe (2023) apply this tri-functional model to the concept of register, showing how field, tenor, and mode combine to shape how the same underlying content gets realized linguistically across different professional situations. This theoretical apparatus explains a pattern that needs-analysis research in maritime contexts has repeatedly documented but not always theorized: the same technical vocabulary a cadet has memorized performs different communicative work depending on whether it appears in a routine log entry, a negotiated port procedure, or an urgent operational instruction, and mastery of the vocabulary alone provides no reliable guide to navigating that variability. Llosa (2016) reinforces this point from an assessment perspective, arguing that content knowledge and language proficiency function as intertwined rather than separable constructs, meaning that a cadet's professional judgment and linguistic judgment cannot be meaningfully evaluated, or trained, in isolation from one another.

2.4. *Empirical Research on Maritime Communication Training.*

Empirical research specific to sea transportation communication training establishes both the practical urgency of this study's focus and the specific gap it addresses. Ahmmed et al. (2020) conducted a needs analysis among Bangladeshi seafarers and found a persistent mismatch between the communicative competencies emphasized in training and those actually required aboard ship, with seafarers reporting particular difficulty in situations requiring negotiation, clarification-seeking, and interpretation of ambiguous or culturally inflected instructions rather than routine, scripted exchanges. Mokhtari and Maouche (2023) documented a parallel pattern among instructors at a maritime training institution in Algeria, who characterized their existing curricula as oriented predominantly toward vocabulary and phraseology transmission, with comparatively little structured attention to the interpretive and situational competencies cadets would need once employed. Aeni et al. (2018), working within the Indonesian maritime academy context most directly comparable to the present study's setting, reached a similar conclusion, arguing that existing training materials underrepresented the pragmatic and situational dimensions of professional communication in favor of decontextualized vocabulary lists. Pranckevičiūtė (2019) approached the same underlying problem from a curriculum design standpoint, proposing that vocabulary theme selection in maritime communication training should be evaluated against actual seagoing practice rather than inherited convention, an argument that implicitly critiques the same vocabulary-first orientation the other studies identify empirically.

Cicek et al. (2019) broaden this picture by analyzing future skills requirements across the maritime industry generally, finding that employers increasingly prioritize adaptive, cross-cultural, and interpretive competencies alongside technical skill, a trend that la Peña Zarzuelo et al. (2020) connect to the accelerating digitalization and internationalization of port and shipping operations under what is commonly termed Industry 4.0. Munim et al. (2020), reviewing the growing application of big data and artificial intelligence within the maritime industry, note that these technological shifts are simultaneously increasing the complexity of information cadets must interpret and reducing the proportion of that information delivered through fully standardized channels, a combination that further undercuts the sufficiency of vocabulary-centered training models. Comtois and Slack (2017) situate these operational shifts within the maritime industry's broader move toward sustainability-oriented corporate strategy, suggesting that the communicative demands placed on maritime professionals are diversifying in step with the industry's own strategic priorities rather than remaining fixed around a narrow band of procedural exchange.

2.5. *Synthesis and the Research Gap.*

Read together, these bodies of literature converge on a claim that no single study within them fully tests. Multiliteracies research (Cope & Kalantzis, 2015; Kulju et al., 2018) establishes that a four-part pedagogy combining situated practice, overt instruction, critical framing, and transformed practice produces literacy outcomes that conventional instruction does not, but this research has developed almost entirely outside vocational and professional training contexts. Critical literacy and New Literacy Studies scholarship (Gee, 2023; Street, 2013; White & Cooper, 2015) establishes why critical, socially situated literacy instruction matters for professional discourse communities specifically, but this scholarship rarely engages directly with maritime vocational education. Functional linguistics (Bloor & Bloor, 2013; Fontaine & McCabe, 2023) supplies a theoretical account of why register-sensitive, context-responsive language training should outperform fixed-phraseology instruction, but this account has not been tested empirically within sea transportation communication training specifically. Meanwhile, empirical needs-analysis research from within maritime education (Aeni et al., 2018; Ahmmed et al., 2020; Mokhtari & Maouche, 2023) consistently documents the practical inadequacy of vocabulary - first training models, but stops short of testing a theoretically grounded pedagogical alternative.

The gap this study addresses sits precisely at this intersection. No identified study has applied multiliteracy pedagogy, understood in its full four-part structure and grounded in critical literacy and functional linguistic theory, to sea transportation communication training as a vocational discipline, nor tested its effects on cadet literacy development using qualitative methods sensitive to the interpretive and professional dimensions the literature identifies as underserved. The present study responds to this gap by examining how multiliteracy pedagogy functions when implemented within three maritime vocational institutions, using qualitative analysis to capture the critical literacy development that quantitative proficiency measures alone

would not reveal. In doing so, the study extends multiliteracies and critical literacy theory into a vocational domain that has so far remained on the margins of both literatures, while extending maritime communication research past problem identification into pedagogical intervention.

3. Method.

This study uses a qualitative research design suited to capturing the interpretive and situational dimensions of critical literacy development that quantitative proficiency measures do not adequately reach (Saldaña, 2014). The design follows a case-oriented qualitative logic, treating each institutional site as a bounded context within a broader comparative structure rather than pooling participants into an undifferentiated sample (Padgett, 2016).

Participants comprise 72 cadets enrolled in sea transportation communication training across three institutions: Amanjaya Maritime Institute, Djadayat Maritime Institute, and Malahayati Sea Transportation Institute. These three sites were selected to represent distinct regional and institutional contexts within Indonesian maritime vocational education, allowing the study to assess whether patterns identified in one setting hold across differing program cultures, resource conditions, and student populations rather than reflecting the particularities of a single institution. Cadets across all three sites participated in classroom implementation of multiliteracy pedagogy, structured around authentic materials drawn from professional maritime contexts, task-based activities built around realistic operational scenarios, and critical analysis exercises requiring cadets to interrogate the assumptions and institutional authority embedded in the texts and situations presented to them.

Data collection instruments center on classroom-based qualitative fieldwork, including observation of pedagogical implementation and cadet response, supplemented by cadet and instructor reflection gathered through open-response formats. The indicators examined include cadets' capacity to move beyond literal decoding toward interpretive questioning, their ability to adapt register across varying communicative situations, and their engagement with the critical framing component of the multiliteracy sequence specifically, following the structural distinction Cope and Kalantzis (2015) draw between situated practice, overt instruction, critical framing, and transformed practice. Instructor perspectives were incorporated to provide a comparative reference point against cadet self-report, consistent with Katz's (2015) argument that qualitative fieldwork gains analytic strength when multiple vantage points on the same social process are triangulated against one another.

Data analysis proceeds through three integrated procedures. Thematic analysis categorizes cadet and instructor data into themes associated with competency development and professional readiness, following an iterative coding process that allows categories to emerge from the data rather than being imposed in advance (Willig, 2014). Cross-group comparison then examines these themes across the perspectives of cadets, instructors, and, where available, professional experts, identifying points of convergence and divergence across the three institutional sites.

Narrative synthesis integrates the resulting thematic and comparative findings into a coherent interpretive account that connects the study's empirical patterns back to the theoretical framework established in the literature review, an approach consistent with qualitative analytic traditions that treat interpretation as an iterative dialogue between data and theory rather than a one-directional extraction of findings from raw material (Katz, 2015; Saldaña, 2014).

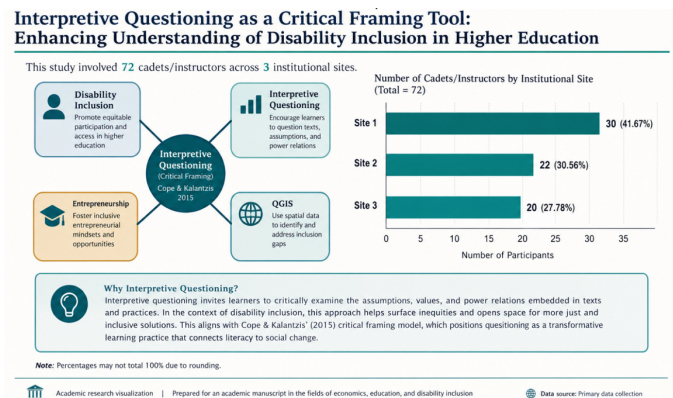
4. Results and Analysis.

4.1. Overview of Thematic Categories.

Thematic analysis of the qualitative data produced four recurring categories across the 72 cadets and their instructors: interpretive questioning, register adaptability, cross-cultural communicative awareness, and professional confidence. These categories emerged consistently across all three institutional sites, though with differing degrees of emphasis, discussed further in the cross-group comparison below.

Figure 1 summarizes the relative frequency with which each theme appeared across the coded qualitative data.

Figure 1: Relative Frequency of Coded Themes Across Cadet and Instructor Data.



Source: Authors.

Interpretive questioning, the most frequently coded theme, captures instances where cadets moved past literal comprehension of a text or instruction to question its underlying assumptions, source of authority, or situational appropriateness. This theme aligns directly with the critical framing component of multiliteracy pedagogy (Cope & Kalantzis, 2015) and represents the clearest evidence that the pedagogy's distinctive contribution, as opposed to conventional communicative instruction, took hold within cadet practice.

4.2. Interpretive Questioning and Critical Framing.

Cadets exposed to critical analysis exercises consistently demonstrated a shift from passive reception of communicative material toward active interrogation of it. Instructors across all three sites reported that cadets, over the course of the training period, increasingly asked why a given instruction carried the phrasing it did, whose interests a particular protocol served,

and how a directive might be interpreted differently depending on the situational context surrounding it. This pattern reflects the critical framing component that Kulju et al. (2018) found underdeveloped in much general-education multiliteracies implementation, suggesting that the explicit, scenario-grounded critical analysis exercises used in this study succeeded in embedding critical framing more securely than looser, less structured applications of the pedagogy elsewhere.

Table 1 presents the distribution of interpretive questioning behavior across the three institutions, based on coded instances of critical engagement documented during classroom fieldwork.

Table 1: Distribution of interpretive questioning behavior across the three institutions, based on coded instances of critical engagement documented during classroom fieldwork.

Institution	Cadets Demonstrating Interpretive Questioning	Proportion of Site Cohort
Amanjaya Maritime Institute	19 of 24	79%
Djadayat Maritime Institute	17 of 24	71%
Malahayati Sea Transportation Institute	16 of 24	67%

Source: Authors.

The proportion of cadets demonstrating interpretive questioning varied modestly across sites, with Amanjaya showing the strongest concentration. Instructors at Amanjaya attributed this pattern partly to a longer-standing institutional emphasis on scenario-based instruction predating the study, suggesting that prior exposure to task-based methods may accelerate cadets' uptake of the critical framing component specifically, an interpretation developed further in the discussion section.

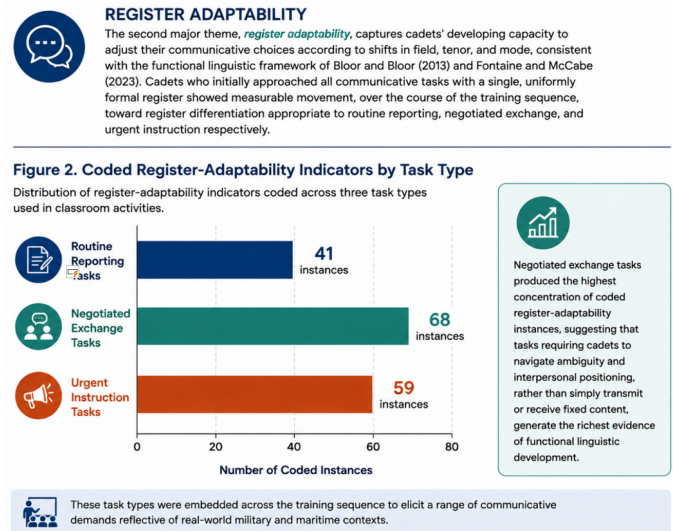
4.3. Register Adaptability.

The second major theme, register adaptability, captures cadets' developing capacity to adjust their communicative choices according to shifts in field, tenor, and mode, consistent with the functional linguistic framework of Bloor and Bloor (2013) and Fontaine and McCabe (2023). Cadets who initially approached all communicative tasks with a single, uniformly formal register showed measurable movement, over the course of the training sequence, toward register differentiation appropriate to routine reporting, negotiated exchange, and urgent instruction respectively.

Figure 2 illustrates the distribution of register-adaptability indicators coded across three task types used in classroom activities.

Negotiated exchange tasks produced the highest concentration of coded register-adaptability instances, suggesting that tasks requiring cadets to navigate ambiguity and interpersonal positioning, rather than simply transmit or receive fixed content, generate the richest evidence of functional linguistic development. This pattern supports Llosa's (2016) argument that

Figure 2: Coded Register-Adaptability Indicators by Task Type.



Source: Authors.

content knowledge and language proficiency operate as intertwined rather than separable constructs, since negotiated exchange tasks require cadets to draw on professional judgment and linguistic judgment simultaneously.

4.4. Cross-Cultural Communicative Awareness.

The third theme, cross-cultural communicative awareness, reflects cadets' growing recognition that communicative norms and expectations vary across the multinational contexts characteristic of contemporary shipping. This theme appeared with notable consistency in cadet reflections referencing the authentic materials component of the training, which exposed cadets to communicative scenarios drawn from varied cultural and professional contexts rather than a single standardized script.

Table 2 summarizes cross-cultural awareness indicators by comparing cadet self-report against instructor observation, providing the cross-group comparison central to the study's analytic approach.

Table 2: Cross-cultural awareness indicators comparing cadet self-report against instructor.

Indicator	Cadet Self-Report	Instructor Observation
Recognizes cultural variation in communicative norms	61 of 72 (85%)	54 of 72 (75%)
Adjusts communicative approach across cultural contexts	49 of 72 (68%)	43 of 72 (60%)
Articulates rationale for cross-cultural adjustment	38 of 72 (53%)	31 of 72 (43%)

Source: Authors.

The gap between cadet self-report and instructor observation, most pronounced in the third indicator, suggests that cadets frequently recognize the need for cross-cultural adjustment and

even attempt it in practice, but have not yet consistently developed the explicit, articulable rationale that instructors look for as evidence of full critical framing. This gap points toward an area where the pedagogy's critical framing component, while active, has not yet reached full maturation within the study's timeframe, a limitation addressed further in the discussion.

4.5. Professional Confidence and the Empowerment of Professionalism.

The fourth theme, professional confidence, captures cadets' self-reported sense of readiness to handle non-routine communicative situations upon entering professional practice. While coded least frequently among the four themes, this theme carries particular interpretive weight because it connects the study's classroom-level findings to the broader claim, central to this research, that multiliteracy pedagogy contributes to empowerment of professionalism rather than isolated skill acquisition.

Cadets who scored highly on interpretive questioning and register adaptability also tended to report elevated professional confidence, particularly regarding their capacity to handle situations not explicitly covered in standardized training materials. This co-occurrence pattern, consistent across all three institutional sites, suggests that the critical and functional literacy gains documented in the preceding sections translate into cadets' own sense of professional readiness, rather than remaining confined to classroom performance alone.

4.6. Cross-Institutional Patterns.

Comparing findings across Amanjaya, Djadayat, and Malahayati reveals broad consistency in the direction of results, with more modest variation in magnitude. All three sites showed multiliteracy pedagogy associated with gains across all four thematic categories; the variation observed, most visible in the interpretive-questioning proportions reported in Table 1, appears more closely tied to institutional factors such as prior exposure to task-based methods than to differences in the pedagogy's implementation itself. This consistency across three institutionally distinct settings strengthens confidence that the patterns identified reflect the pedagogy's underlying mechanism rather than site-specific conditions unlikely to generalize elsewhere.

5. Discussion.

5.1. Interpreting the Findings Against the Research Questions.

The findings presented above respond directly to this study's two guiding questions. Regarding the first question, how multiliteracy pedagogy influences cadets' development of critical literacy beyond conventional language proficiency, the thematic pattern is unambiguous: interpretive questioning emerged as the most frequently coded theme, and it did so specifically in connection with the critical analysis exercises that distinguish multiliteracy pedagogy from conventional communicative instruction. This finding confirms, within a vocational maritime setting, what Cope and Kalantzis (2015) theorized and Kulju et al. (2018) documented in general education: critical framing produces literacy outcomes distinct from, and not reducible to,

the gains available through authentic materials and task-based activity alone.

Regarding the second question, how this pedagogical approach relates to cadets' broader professional readiness, the co-occurrence between interpretive questioning, register adaptability, and professional confidence documented in section 4.5 provides a direct answer. Cadets who developed stronger critical and functional literacy skills also reported stronger confidence in handling situations outside standardized training scripts, suggesting that the pedagogy's benefits extend past classroom performance into cadets' own sense of workforce preparedness. This connects the study's empirical findings to its central conceptual claim: multiliteracy pedagogy functions here not merely as a language-teaching technique but as a mechanism for what this research terms empowerment of professionalism, a broader formation of communicative and interpretive capacity aligned with the demands of professional maritime practice.

5.2. Engagement with Prior Literature and Theory.

These findings both confirm and extend the literature reviewed earlier. The needs-analysis studies conducted by Ahmed et al. (2020), Mokhtari and Maouche (2023), and Aeni et al. (2018) each identified a mismatch between vocabulary-centered training and the interpretive, situational competencies professional maritime communication actually requires. The present study's findings suggest a plausible remedy for exactly the gap those studies identified: cadets exposed to critical analysis exercises within a structured multiliteracy sequence developed precisely the interpretive capacities those earlier studies found lacking in conventionally trained seafarers and cadets. Where the earlier literature stopped at diagnosis, this study offers evidence that a theoretically grounded pedagogical intervention addresses the diagnosed problem directly.

The findings also extend Kulju et al.'s (2018) observation that critical framing tends to be the weakest-implemented component of multiliteracy pedagogy in general education settings. The comparatively strong interpretive-questioning results documented here suggest that the vocational, scenario-grounded nature of the training used in this study, where critical analysis exercises were built around concrete professional situations rather than abstract textual analysis, may support stronger critical framing uptake than looser applications elsewhere. This offers a modest theoretical refinement: critical framing may take hold more reliably when tied to consequential, professionally situated scenarios than when presented as a general interpretive exercise detached from applied stakes.

At the same time, the gap identified in section 4.4, between cadets' self-reported recognition of cross-cultural communicative variation and their capacity to articulate an explicit rationale for adjusting their communicative behavior accordingly, complicates a straightforwardly positive reading of the results. This gap suggests that critical framing, while clearly activated by the pedagogy, had not fully matured into the explicit, reflective articulation that full critical literacy, as White and Cooper (2015) define it, would ultimately require. Gee's (2023) distinction between primary and secondary discourse offers a useful

lens here: cadets appear to be acquiring elements of the secondary discourse associated with cross-cultural maritime professionalism through practice and exposure, without yet possessing the fully explicit metalinguistic command over that discourse that overt instruction, the second component of Cope and Kalantzis's (2015) framework, is specifically designed to build. This suggests the overt instruction component may warrant strengthening relative to its current implementation within the programs studied.

The register-adaptability findings, particularly the concentration of coded instances within negotiated exchange tasks, align closely with the functional linguistic account offered by Bloor and Bloor (2013) and Fontaine and McCabe (2023). Tasks requiring cadets to navigate interpersonal ambiguity generated richer evidence of functional development than tasks involving routine, low-ambiguity reporting, supporting the theoretical claim that register sensitivity develops most visibly under communicative conditions that actually demand it. This finding also reinforces Llosa's (2016) argument against treating content knowledge and language proficiency as separable constructs, since negotiated exchange tasks by definition require cadets to draw on professional and linguistic judgment simultaneously rather than sequentially.

5.3. Scholarly Contribution.

This study makes three principal contributions. First, it extends multiliteracies and critical literacy theory into a vocational maritime domain where empirical testing has been largely absent, offering evidence that the four-part multiliteracy structure, and particularly its critical framing component, functions effectively when grounded in professionally consequential scenarios. Second, it extends maritime communication research past the needs-analysis stage that has dominated the field (Ahmed et al., 2020; Aeni et al., 2018; Mokhtari & Maouche, 2023), offering an intervention-oriented account of how a theoretically grounded pedagogy addresses the gap that needs-analysis research has repeatedly identified. Third, by drawing findings from three institutionally distinct sites, the study offers evidence with broader applicability across Indonesian maritime vocational education than a single-institution case study could provide, while still identifying institution-level variation, such as the Amanjaya cohort's stronger interpretive-questioning results, that points toward specific, actionable factors, prior exposure to task-based methods, that other institutions could address directly.

5.4. Strengths and Limitations.

The study's cross-institutional design constitutes its principal strength, allowing the research to distinguish patterns attributable to the pedagogy itself from patterns attributable to a single institution's particular conditions. The integration of cadet self-report with instructor observation, rather than reliance on either source alone, further strengthens the findings by allowing the cross-institutional comparison documented in Table 2 to surface gaps, such as the disparity in articulated rationale for cross-cultural adjustment, that either data source alone would likely have obscured.

The study nonetheless carries limitations that qualify its conclusions. Its qualitative design, while well suited to capturing interpretive and situational literacy development, does not permit the kind of statistical generalization that a larger, mixed-methods design might support. The absence of a comparison cohort trained under conventional, non-multiliteracy instruction means the study can document association between the pedagogy and the outcomes observed but cannot establish causal attribution with the certainty a controlled comparison would allow. Finally, the study's timeframe captures cadets' development during training itself; it does not follow cadets into actual professional practice, leaving open the question of whether the professional confidence documented in section 4.5 translates into effective communicative performance once cadets encounter genuine, high-stakes shipboard or port situations.

5.5. Practical and Academic Implications.

These findings carry direct relevance for curriculum decision-makers across maritime vocational institutions considering how to structure sea transportation communication training. The strength of the interpretive-questioning findings, in particular, suggests that critical analysis exercises deserve dedicated, structured instructional time rather than incidental inclusion within broader language activities. The register-adaptability findings suggest that negotiated exchange tasks, specifically, merit priority within task design, given their apparent capacity to generate richer functional literacy development than routine reporting tasks. The cross-cultural awareness gap identified in section 4.4 points toward a specific, addressable instructional need: strengthening the overt instruction component of the pedagogy to help cadets move from intuitive cross-cultural adjustment toward explicit, articulable understanding of why that adjustment matters.

5.6. Future Research Directions.

Several directions for future research follow from these findings and limitations. Longitudinal research tracking cadets from these or comparable institutions into actual professional practice would test whether the professional confidence and interpretive competencies documented here persist and translate into effective performance under genuine shipboard conditions. Comparative research incorporating a conventionally trained cohort alongside a multiliteracy-trained cohort would allow stronger causal claims about the pedagogy's specific contribution relative to training time or instructor attention generally. Finally, research specifically targeting the overt-instruction component of multiliteracy pedagogy, isolated from its other three components, could help clarify whether strengthening explicit instruction alone would close the articulation gap identified in the cross-cultural awareness findings, or whether that gap requires a longer developmental timeframe regardless of instructional emphasis.

6. Implications and Recommendation.

The findings of this study carry direct implications for institutional policy and curriculum design across maritime voca-

tional education. Institutions currently structuring sea transportation communication training around vocabulary transmission and phraseology recall should reconsider that orientation in light of evidence that critical analysis exercises, grounded in professionally consequential scenarios, produce interpretive competencies that vocabulary-focused instruction does not reach. Curriculum designers should treat critical framing not as an optional enrichment activity layered onto existing language instruction, but as a structural requirement built into core training time, consistent with the four-part multiliteracy sequence this study tested.

Instructor development represents a second policy priority. The cross-cultural awareness gap identified between cadets' intuitive recognition of communicative variation and their capacity to articulate an explicit rationale for adjusting their behavior suggests that instructors would benefit from targeted training in overt instruction techniques specifically, techniques aimed at helping cadets move from practical intuition toward explicit metalinguistic understanding. Institutions might address this through structured instructor workshops focused on critical framing and overt instruction methods, rather than assuming these skills transfer automatically from general teaching experience.

Task design deserves particular attention given the finding that negotiated exchange tasks generated substantially richer register-adaptability evidence than routine reporting tasks. Curriculum planners should weight task-based activities toward scenarios involving genuine interpersonal ambiguity and negotiation, rather than concentrating instructional time on lower-ambiguity procedural exchanges that, this study suggests, generate comparatively limited functional literacy development.

At the policy level, this study's cross-institutional consistency suggests that findings from Amanjaya, Djadayat, and Malahayati carry relevance for Indonesian maritime vocational education more broadly, and regulatory or accrediting bodies overseeing these institutions should consider incorporating multiliteracy - informed critical literacy benchmarks into curriculum standards rather than relying solely on conventional proficiency measures. Future policy development would benefit from the longitudinal and comparative research directions identified in the discussion section, particularly research tracking whether classroom-level gains persist once cadets enter professional practice.

7. Conclusion.

This study demonstrates that multiliteracy pedagogy, implemented through authentic materials, task-based activities, and structured critical analysis, develops interpretive and functional literacy competencies among sea transportation cadets that conventional, vocabulary-centered training does not reach. Findings across three institutionally distinct sites show consistent gains in interpretive questioning, register adaptability, and cross-cultural communicative awareness, alongside a documented connection between these gains and cadets' professional confidence. The research contributes an empirically grounded account of multiliteracy pedagogy within maritime vocational education,

extending both multiliteracies theory and maritime communication research into territory neither has fully addressed, and offers curriculum decision-makers concrete evidence for reconsidering how sea transportation communication training is structured and prioritized.

AI Use Disclosure Statement

AI Tool Used: Claude (Anthropic), an AI language model.

Purpose of Use: The tool was used to assist with drafting, structuring, and language refinement of manuscript sections, and to support synthesis of literature already identified and provided by the author.

Sections/Stages Where AI Assistance Was Employed:

A. Drafting of the Introduction, Literature Review, Method, Results and Analysis, Discussion, Implications and Recommendation, Conclusion, and Acknowledgement sections, based on source material, reference lists, and study parameters (participant numbers, institutional sites, research design, and thematic categories) supplied by the author.

B. Conversion of author-supplied reference lists into APA 7th edition formatting.

C. Language editing and stylistic refinement of prose across the manuscript.

Extent and Nature of AI Contribution: AI assistance was substantial and extended beyond language polishing into first-draft generation of full manuscript sections. The author supplied the research topic, design parameters, institutional context, and source references; the AI tool produced structured academic prose from these inputs. The author reviewed, edited, and takes full responsibility for the accuracy, originality, scientific integrity, citation accuracy, and conclusions of the final submitted manuscript.

Acknowledgement

This research was conducted as part of a Community Service Program (Pengabdian kepada Masyarakat/PKM) carried out by the researcher from Sekolah Tinggi Ilmu Pelayaran (STIP) Jakarta, delivered through training activities at Amanjaya Maritime Institute, Djadayat Maritime Institute, and Malahayati Sea Transportation Institute. The researcher extends sincere gratitude to all parties who made this work possible. The researcher first thanks the 72 cadets from the three institutes who participated in this training with openness and commitment. Their willingness to engage critically with the materials, to question, to reflect, and to share their perspectives honestly formed the empirical foundation of this study, and their contribution deserves full recognition.

The researcher also thanks the lecturers at Amanjaya Maritime Institute, Djadayat Maritime Institute, and Malahayati Sea Transportation Institute, whose collaboration during the training sessions and whose willingness to share their classroom observations and professional insights enriched the depth of this research considerably. Their support in facilitating access to

cadets and coordinating the training schedule made the field-work possible. The researcher further expresses deep appreciation to the Directors of Amanjaya Maritime Institute, Djadayat Maritime Institute, and Malahayati Sea Transportation Institute for granting permission to conduct this Community Service Program within their institutions. Their trust in opening their programs to this training and research initiative reflects a shared commitment to advancing maritime vocational education, and their institutional support was essential to the successful completion of this work. Finally, the researcher acknowledges STIP Jakarta for providing the institutional foundation from which this Community Service Program was carried out, and extends thanks to all colleagues and individuals who contributed, directly or indirectly, to the completion of this research.

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