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A Pragmatic Perspective on Technical Indonesian in Engineering Education: A Documentary Study at Institut Teknologi PLN

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ABSTRACT

Indonesian language use in higher technical education functions not merely as a medium for transferring information but also as an instrument for constructing reasoning, presenting scientific arguments, delivering instructions, negotiating meaning, and developing students' professional competence. This study examines the pragmatic dimensions of Technical Indonesian in engineering education at Institut Teknologi PLN (ITPLN), focusing on speech-act functions, contextual use of technical terminology, instructional strategies, conceptual clarification, academic politeness, and academic literacy. A qualitative descriptive case-study approach was employed based on documentary and literature-based analysis. The data consisted of Indonesian-language teaching documents available in the ITPLN institutional repository, previous studies, and scholarly literature concerning pragmatics, academic communication, technical literacy, and Indonesian language instruction for engineering students. The documentary and literature-based analysis suggests several pragmatic characteristics relevant to Technical Indonesian in engineering education, including directive, representative, clarificatory, argumentative, and evaluative functions, as well as the contextual use of specialized terminology. These characteristics are relevant to explaining technical concepts, presenting procedures, preparing academic reports, and communicating analytical findings. Based on the analysis, the study proposes a Pragmatic Model of Technical Indonesian that integrates contextualization, technical-term exploration, pragmatic analysis, technical communication production, and evaluation. The model is proposed as a conceptual pedagogical framework to integrate Indonesian language competence with engineering knowledge and support students' academic literacy and professional communication.

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1. INTRODUCTION

Language has a strategic position in higher education because knowledge cannot be transferred from lecturers to students without passing through linguistic representation. In engineering education, the relationship between language and knowledge becomes particularly complex because many of the objects and phenomena being studied cannot always be observed directly. Concepts such as power system stability, impedance, energy transformation, algorithms, efficiency, control, communication networks, and artificial intelligence require representation through symbols, technical terms, definitions, arguments, explanations, and systematically organized discourse. Consequently, successful engineering learning depends not only on students' mastery of scientific content but also on their ability to use language as an instrument for thinking, constructing knowledge, and communicating technical meanings. The importance of language as part of technical communication in higher education is also reflected in the development of technical communication pedagogy, which emphasizes the relationship between communication practices and disciplinary learning [1].

The importance of language becomes increasingly evident when engineering students engage in academic and professional activities such as writing papers, practicum reports, research proposals, final projects, and other scientific works. In such contexts, inappropriate word choice, sentence construction, spelling, and logical relationships between ideas may affect the precision and comprehensibility of technical information. Sucipta's research identified various spelling errors in papers written by Electrical Engineering students, including errors in capitalization, punctuation, italics, prepositions, word combinations, prefixes, and word writing [2]. These findings indicate that technical competence needs to be accompanied by the ability to communicate scientific knowledge accurately and systematically. This relationship is also evident in the integration of Indonesian language learning with academic literacy among engineering students, particularly in reading, writing, and communicating disciplinary knowledge [3].

Previous research has addressed Indonesian language use in engineering and higher education contexts from several perspectives. Research conducted in the STT PLN environment, for example, developed an Indonesian language learning design for students from Papua [4]. Other research has examined the use of Indonesian in relation to academic understanding among Electrical Engineering students. Batahan et al. reported that Indonesian language use can support the academic understanding of students in Electrical Engineering education [5]. These studies demonstrate the relevance of Indonesian in engineering education, but previous research has generally emphasized language learning, writing, academic literacy, or comprehension rather than the pragmatic functions of Indonesian in technical learning contexts.

Beyond written academic communication, language also plays a central role in educational interaction. Engineering learning involves communication through explanations, questions, instructions, requests for clarification, corrections, feedback, presentations, discussions, and arguments. The linguistic choices used in these interactions do more than convey propositional information; they also perform actions within particular

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social and pedagogical contexts. Pragmatic research provides a framework for understanding such language use because it examines how meaning is constructed through the relationship between linguistic forms, communicative intentions, and contexts of use [6].

The pragmatic perspective views language not merely as a collection of grammatical structures but as a form of action performed by speakers in particular contexts. The linguistic form, communicative intention, relationship between interlocutors, activity context, shared knowledge, and potential consequences of the utterance influence the interpretation of an utterance. Pragmatic competence therefore involves the ability to understand and use language appropriately according to social contexts and communicative goals [7]. In educational settings, this perspective is particularly relevant because learning is fundamentally a communicative process involving the exchange and construction of knowledge.

Speech-act theory provides a more specific basis for examining communicative actions in academic interaction. Communication between lecturers and students may involve utterances that inform, explain, direct, request, question, evaluate, clarify, or respond. Andriani et al., for example, identified various speech-act forms in conversations between university students and lecturers during the learning process [8]. Tiara likewise examined speech acts produced by lecturers and students in online academic activities [9]. These studies demonstrate that academic interaction can be examined as a sequence of communicative actions rather than merely as an exchange of grammatical forms.

Speech-act analysis has also been applied to classroom interaction more broadly. Darong examined the types and functions of speech acts in EFL classroom interactions, demonstrating the usefulness of speech-act analysis for identifying the communicative functions performed through classroom language [10]. Ghozali et al. similarly analyzed teacher talk in an Indonesian EFL classroom and identified speech acts as an important dimension of classroom communication [11]. Although these studies were conducted in language-learning contexts, they provide a relevant analytical foundation for examining language as action in other educational domains. The present study applies this pragmatic perspective specifically to Indonesian-language engineering education.

Another important dimension of academic interaction is politeness. Lecturers need to communicate corrections, criticism, instructions, and feedback while maintaining productive academic relationships, whereas students need to formulate questions, disagreements, requests, and responses appropriately within the lecturer–student relationship. Research by Sudrajat et al. identified various politeness strategies used by lecturers toward students in Indonesian language learning [12]. Tubi et al. examined the politeness of students' WhatsApp messages to lecturers, showing that student–lecturer communication also involves considerations of appropriate interpersonal language use [13]. Eksan et al. likewise examined students' politeness toward lecturers from a pragmatic perspective [14].

The relationship between language use and interpersonal relations can be further understood through sociopragmatics. Sociopragmatic analysis considers how pragmatic choices are shaped by social relationships, contextual expectations, and interactional conditions [15]. The study of politeness similarly emphasizes that appropriate language use

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involves the management of interpersonal relations rather than simply the selection of grammatically correct forms [16]. These perspectives are relevant to engineering education because technical communication takes place within academic relationships characterized by differences in roles, expertise, authority, and communicative expectations.

Nevertheless, much of the pragmatic literature in language education has developed from second-language (L2) pragmatics and English as a Foreign Language (EFL) contexts. Research on pragmatic competence has frequently examined how learners acquire and use pragmatic knowledge in additional-language settings [17]. Similarly, pragmatic learning research has emphasized the development of learners' ability to interpret and produce language appropriately in communicative contexts [18]. Although these studies provide important theoretical insights into pragmatic competence, their direct application to Indonesian-medium engineering education requires contextual consideration. The present study therefore uses pragmatic concepts as an analytical framework while situating them within Indonesian-language engineering education.

This distinction is important because the primary issue in the present study is not whether students are learning Indonesian as a foreign or second language, but how Indonesian functions as a medium for constructing, explaining, negotiating, and communicating engineering knowledge. The study focuses on Indonesian as used within a specialized engineering domain, where technical terminology, academic discourse, scientific explanation, and disciplinary communication intersect. In this context, the use of standardized Indonesian spelling and writing conventions also remains important for ensuring clarity and consistency in technical communication. The current Indonesian spelling system is formally established through the *Ejaan Bahasa Indonesia yang Disempurnakan*, which provides the normative basis for Indonesian spelling practices [19].

In this study, the term Technical Indonesian is used as a working concept to refer to the use of Indonesian for teaching, learning, documentation, and scientific communication within the engineering domain. It is not intended to imply that Technical Indonesian constitutes an independent language variety separate from Indonesian. Rather, it refers to Indonesian as used within a specialized engineering domain, characterized by specialized terminology, disciplinary discourse structures, technical communicative purposes, and context-dependent ways of representing engineering knowledge.

Technical Indonesian overlaps with concepts such as academic Indonesian, engineering discourse, technical language, and Indonesian for Specific Purposes, but these concepts are not identical. Academic Indonesian refers broadly to language practices associated with academic knowledge production and communication. Engineering discourse refers to discourse practices shaped by the epistemological and communicative conventions of engineering. Technical language emphasizes specialized terminology and linguistic features associated with a technical domain. Indonesian for Specific Purposes emphasizes language use and learning for particular professional or disciplinary needs. Research on language needs in Informatics Engineering, for example, demonstrates the relevance of specialized language instruction to the communicative requirements of a particular engineering discipline [20].

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This conceptualization also requires distinguishing linguistic knowledge from the ability to use technical language communicatively. Technical Indonesian competence can consequently be viewed through three interconnected levels. The first is term mastery, namely the ability to recognize, understand, and appropriately use specialized engineering terms. The second is concept mastery, namely the ability to connect technical terms with the underlying engineering concepts and relationships they represent. The third is pragmatic use, namely the ability to employ technical terms, explanations, questions, arguments, instructions, and responses appropriately according to communicative purposes and interactional contexts. This distinction is important because knowing the meaning of a technical term does not necessarily mean that a student can use that term appropriately when explaining a phenomenon, responding to a lecturer's question, defending a technical argument, or collaborating with peers.

Against this background, the research problem addressed in this study concerns the limited understanding of how Indonesian functions pragmatically in engineering education and how technical language is represented through communicative functions in this disciplinary context. Previous research has provided evidence concerning Indonesian language learning, spelling, academic literacy, speech acts, politeness, pragmatic competence, and technical communication, but these strands of research have rarely been brought together specifically within Indonesian-medium engineering education.

The study therefore seeks to answer the following research questions: (1) What pragmatic characteristics of Indonesian are represented in engineering education documents? (2) What communicative functions are associated with technical terminology, directive expressions, representative expressions, interrogative expressions, evaluative expressions, and clarificatory expressions? (3) How are technical terms and engineering concepts represented through pragmatic language use? (4) What implications do these findings have for the development of Technical Indonesian learning in engineering education?

The novelty of this study lies in connecting pragmatic analysis with Indonesian-language engineering education rather than treating language competence primarily as a matter of spelling, writing accuracy, or general academic literacy. By examining Indonesian as a medium for communicating technical knowledge, the study brings together three dimensions that are often considered separately: terminological knowledge, conceptual understanding, and pragmatic use. This approach positions Technical Indonesian as a disciplinary communication practice in which language is used not only to name engineering concepts but also to explain, question, direct, evaluate, clarify, and communicate technical knowledge.

The study is expected to contribute both theoretically and practically. Theoretically, it contributes to the discussion of pragmatics in higher education by extending pragmatic analysis to Indonesian-medium engineering education and by positioning technical language use within a disciplinary context. Practically, the findings may provide a basis for developing Indonesian language instruction for engineering students that integrates terminology, conceptual understanding, pragmatic appropriateness, and scientific communication. Such integration may support engineering students in explaining technical concepts, constructing

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arguments, presenting findings, responding to feedback, and communicating engineering knowledge appropriately across academic and professional contexts.

2. METHOD

Research Design

This study employed a qualitative descriptive design with a documentary case study approach. The qualitative approach was selected because the study aimed to understand how Indonesian is positioned and used in the context of engineering education rather than to test causal relationships or produce statistical generalizations. The case was bounded by the use and teaching of Indonesian within the engineering education environment of the Institut Teknologi PLN (ITPLN), particularly as represented in institutional teaching documents and relevant academic literature. The analysis focused on linguistic forms, communicative functions, contextual meanings, and their implications for the development of Indonesian language learning in engineering education.

The pragmatic orientation of the study is based on the understanding that language forms may perform different communicative actions depending on their context of use. Speech-act analysis has been applied in educational settings to identify communicative functions in both classroom and digital academic environments [21]. The present study adopts this analytical orientation while limiting its empirical claims to the documentary materials available for analysis.

Because the available empirical materials did not consist of audio- or video-recorded classroom interactions, the study does not claim to reconstruct naturally occurring lecturer–student conversations. Instead, pragmatic functions were analyzed insofar as they were represented in the available documentary materials and supported by established pragmatic literature. Previous studies and theoretical literature were treated as secondary sources for conceptual interpretation and comparison rather than as equivalent to primary empirical data.

Research Location and Time

The research was conducted through document retrieval and analysis within the ITPLN institutional and academic information environment. The documentary materials were obtained from publicly accessible institutional repositories and other academic sources relevant to Indonesian language education in engineering programs. The document identification, retrieval, and analysis process was conducted during the research period specified by the authors. Each document was examined in relation to its institutional origin, educational function, and relevance to Indonesian-language instruction in engineering education.

Research Object and Unit of Analysis

The research object was the use and representation of Indonesian in engineering education at ITPLN. The primary unit of analysis was the linguistic and communicative content contained in institutional teaching documents, particularly materials related to Indonesian language instruction in engineering study programs. The analysis included technical terms, definitions, instructional statements, explanatory statements, questions or

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question-like formulations, feedback or correction statements when present, and other language forms that reflected particular communicative purposes.

The case was therefore defined by three boundaries: institutional boundary, namely the ITPLN engineering education environment; disciplinary boundary, namely engineering-related Indonesian language education; and documentary boundary, namely institutional and academic documents that directly addressed Indonesian language instruction, learning activities, or communication in engineering education.

This unit of analysis is consistent with previous pragmatic research that examines linguistic expressions in academic learning environments and classifies them according to their communicative or illocutionary functions [21]. However, unlike studies based on direct interactional corpora, the present study analyzes the linguistic representations available in institutional documents.

Data Sources

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The study distinguished between primary documentary data and secondary sources.

The primary documentary data consisted of institutional documents obtained from the ITPLN repository and related institutional sources. These included Indonesian language teaching documents available in engineering study programs. For example, documents from the D3 Mechanical Engineering Study Program included course-related teaching materials, semester learning plans, examination-related documents, and other supporting instructional materials. Only documents containing information relevant to Indonesian language teaching, learning activities, technical communication, or the representation of engineering knowledge through Indonesian were treated as primary documentary data.

The secondary sources consisted of previous empirical studies and scientific literature concerning Indonesian language learning in engineering education, pragmatics, speech acts, politeness, academic communication, and engineering student literacy. One relevant previous study was the Indonesian language learning design developed for students from Papua in the STT PLN environment. These sources were used to establish the theoretical framework, contextualize the documentary findings, and compare the patterns identified in the primary documents.

The distinction between the two categories was maintained throughout the analysis. Previous studies and theoretical publications were not counted as empirical observations of ITPLN learning interactions.

Document Selection Protocol

Documents were selected purposively according to their relevance to the research questions. The inclusion criteria were: (1) documents originating from ITPLN or directly concerning Indonesian language education in an ITPLN engineering study program; (2) documents containing Indonesian-language instructional, academic, or technical communication content; (3) documents that provided information relevant to the representation, explanation, instruction, or communication of engineering knowledge; and (4) documents that could be identified by their title, institutional source, document type, or other bibliographic information.

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Documents were excluded when they: (1) had no substantive relationship to Indonesian language learning or communication in engineering education; (2) contained only administrative information without relevant linguistic content; (3) duplicated another document; or (4) were inaccessible or lacked sufficient information to establish their institutional or academic context.

For each selected document, the researchers recorded its document identifier, title, document type, institutional source, study program, academic context, retrieval source, and relevance to the research questions. This protocol was used to ensure that document selection was systematic rather than based solely on convenience.

Because the study was documentary in nature, the final manuscript should report the number of documents analyzed together with their types and academic year or publication range. These details should be based on the actual documentary corpus and should not be estimated.

Data Collection Technique

Data were collected through systematic documentation. First, potentially relevant ITPLN institutional documents were identified through the institutional repository and related academic sources. Second, the documents were screened using the predefined inclusion and exclusion criteria. Third, eligible documents were retrieved and catalogued using document identifiers. Fourth, relevant linguistic units were extracted from the documents and organized according to their educational and communicative functions.

Secondary literature was collected through searches of academic publications addressing pragmatics, speech acts, politeness, Indonesian language learning, academic communication, and engineering student literacy. The literature was used to establish theoretical concepts and provide comparative perspectives rather than to expand the empirical corpus of ITPLN documents.

The use of documentary materials as a source for pragmatic analysis is relevant to the broader development of pragmatic research in educational settings, including studies examining language produced through Learning Management Systems and other mediated academic environments [21]. In the present study, however, documentary evidence was treated according to its actual status and was not interpreted as equivalent to naturally occurring classroom interaction.

Research Instrument

The primary research instrument was a document analysis protocol developed to guide systematic identification and interpretation of relevant linguistic data. The protocol contained fields for document identification, linguistic form, technical terminology, communicative function, contextual information, pragmatic category, and relevance to engineering learning.

The pragmatic coding framework was informed by speech-act theory and pragmatic competence literature. Linguistic units were examined according to the action they performed in context, such as explaining, informing, directing, requesting, questioning,

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correcting, responding, or arguing. Speech-act theory provides a basis for distinguishing linguistic expressions according to the actions they perform in communication [33].

The classification of pragmatic functions also drew on research concerning pragmatic competence and pragmatic instruction. Previous studies have emphasized that pragmatic competence involves the appropriate interpretation and production of language in relation to communicative contexts [26]. Task-based approaches to pragmatics likewise demonstrate the importance of relating linguistic forms to communicative purposes and contextual use [31].

Where the documentary evidence did not provide sufficient contextual information to establish a pragmatic function, the linguistic unit was not assigned a definitive pragmatic interpretation.

Data Analysis Technique

The analysis was conducted through five interconnected stages.

First, document familiarization and data extraction were conducted by reading each selected document in its entirety and identifying linguistic units relevant to Indonesian language use in engineering education. The extracted units were recorded together with their document identifiers and contextual information.

Second, linguistic-form identification was conducted by examining technical terms, definitions, instructional expressions, explanatory statements, questions, responses, corrections, and other relevant linguistic forms. At this stage, the analysis remained descriptive and did not immediately assign pragmatic interpretations.

Third, pragmatic coding and classification were conducted by relating each relevant linguistic unit to its communicative function. Speech-act categories were interpreted based on the intended action represented by the utterance or textual expression and were informed by established pragmatic theory. Particular attention was given to representative/informative functions, directive functions, expressive functions, and other categories that could be supported by the documentary context. The analysis of directive expressions was also informed by previous research demonstrating the usefulness of directive speech-act categories in educational interaction [24].

The analysis did not assume that grammatical structure automatically determined pragmatic function. Instead, the researchers considered the communicative purpose represented by each linguistic unit and the context provided by the document. This approach follows the general pragmatic principle that linguistic expressions should be interpreted in relation to their communicative use rather than solely according to their formal structure [33].

Fourth, contextual interpretation was conducted by examining how the linguistic forms functioned within the educational and disciplinary context. This stage considered the relationship between technical terminology, engineering concepts, instructional purposes, and the communicative context represented in the documents. The analysis also considered whether a technical term functioned merely as a vocabulary item or contributed to the explanation, instruction, argumentation, or construction of engineering knowledge.

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Fifth, pedagogical interpretation was conducted by relating the identified patterns to the development of Indonesian language learning for engineering students. The interpretation focused on the relationship among term mastery, concept mastery, and pragmatic use and considered how Indonesian language instruction could support students in communicating technical knowledge appropriately. This pedagogical interpretation was informed by previous research on pragmatic instruction, which emphasizes the importance of connecting language forms with their communicative functions and contexts [23].

The analysis followed an iterative process in which interpretations were compared against the original documentary context and the relevant theoretical framework. Findings that could not be sufficiently supported by the available documentary evidence were not treated as established empirical patterns.

Trustworthiness

The trustworthiness of the qualitative analysis was addressed through four criteria: credibility, transferability, dependability, and confirmability. Credibility was supported through systematic document selection, repeated reading of relevant materials, and comparison between linguistic interpretations and their original documentary contexts. Transferability was addressed by providing clear descriptions of the institutional, disciplinary, and documentary boundaries of the case so that readers can assess the applicability of the findings to other engineering education contexts.

Dependability was supported through the use of a consistent document-selection protocol and coding procedure. Confirmability was maintained by distinguishing empirical documentary evidence from interpretations derived from previous studies and theoretical literature.

In addition, the study avoided assigning quantitative frequencies to speech acts when such frequencies could not be directly established from a complete and systematically defined interactional corpus. Accordingly, the findings should be interpreted as a qualitative analysis of documentary representations of Indonesian language use in engineering education rather than as statistical evidence of the frequency of particular speech acts across ITPLN learning activities.

Ethical Considerations

The study relied primarily on institutional documents and publicly accessible academic literature and did not involve direct intervention with human participants. No personal or confidential information was intentionally extracted from the documentary materials. Where documents contained potentially identifiable information, such information was not used as an analytical focus. The study also maintained a clear distinction between publicly documented institutional information and interpretations developed by the researchers.

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3. RESULTS AND DISCUSSION

3.1 Results

Overview of the Documentary Findings

The documentary analysis identified several recurring representations of Indonesian language use in the engineering education context at the Institut Teknologi PLN (ITPLN). The analyzed materials indicate that Indonesian is positioned not only as a general academic language but also as a medium for representing engineering concepts, organizing learning activities, explaining technical information, and communicating academic knowledge. The findings are presented in terms of technical terminology, directive and representative functions, interrogative and clarificatory expressions, evaluative language, academic politeness, and the relationship between technical language and academic literacy.

Because the empirical corpus consisted of documentary materials rather than recordings or transcripts of naturally occurring classroom interactions, the findings below describe linguistic and pragmatic functions represented in the available documents. They should not be interpreted as quantitative evidence of the frequency or prevalence of particular speech acts in all ITPLN learning activities.

The Position of Indonesian Language in ITPLN Engineering Education

Documents available in the ITPLN repository indicate that Indonesian is integrated into academic activities within the engineering education environment. The documents represent Indonesian as a medium for instructional communication, academic writing, report preparation, presentations, scientific explanation, and technical documentation. In this context, Indonesian functions as a linguistic medium through which engineering concepts and procedures are represented and communicated.

The documentary evidence also shows that Indonesian language use in engineering education is closely connected to disciplinary knowledge. Technical terms, definitions, explanations, instructions, and academic writing are embedded within engineering-related contexts rather than being presented as language forms in isolation. This finding suggests that Indonesian language education in an engineering institution has a disciplinary dimension because language is used to communicate specialized knowledge and perform academic tasks associated with engineering.

Pragmatic Characteristics Represented in Technical Indonesian

The analysis identified six interrelated categories of language use represented in the documentary materials: technical terminology, directive expressions, representative expressions, interrogative expressions, evaluative expressions, and clarificatory expressions. These categories describe the communicative functions represented in the analyzed materials rather than establishing the statistical frequency of speech acts in classroom interaction.

The six categories are interconnected. Technical terminology provides the linguistic representation of specialized concepts, while representative expressions provide explanations of those concepts. Directive expressions organize activities, interrogative expressions support the elicitation and development of reasoning, and clarificatory expressions address potential ambiguity. Evaluative expressions provide responses to

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academic or technical work. Thus, the pragmatic dimension of Technical Indonesian is reflected in the relationship between linguistic forms, communicative purposes, and the engineering context in which those forms are used.

Table 1. Pragmatic Characteristics of Technical Indonesian Represented in the Documentary Materials

No.	Characteristic	Function represented in the documents
1	Technical terminology	Representing specialized engineering concepts
2	Directive expressions	Guiding learning or technical activities
3	Representative expressions	Presenting or explaining facts, information, and concepts
4	Interrogative expressions	Eliciting information and supporting reasoning
5	Evaluative expressions	Providing assessment, feedback, or judgment
6	Clarificatory expressions	Reducing ambiguity and establishing shared understanding

The documentary analysis further indicates that grammatical form does not necessarily determine pragmatic function. An interrogative form, for example, may function not only to request information but also to direct attention toward a particular analytical issue. Similarly, an imperative construction may function as an instructional directive rather than merely as a grammatical example. Pragmatic interpretation therefore requires consideration of the educational context represented in the document.

Directive Expressions as Representations of Pedagogical Action

Directive expressions constitute an important pragmatic category in the analyzed engineering education materials because engineering learning frequently involves procedures, problem-solving activities, practical tasks, and structured academic assignments. The documentary materials contain instructional language that can be interpreted according to the action it is intended to perform.

Based on their represented functions, directive expressions can be grouped into four forms: procedural directives, which guide students in carrying out a task; analytical directives, which direct students to examine or analyze information; evaluative directives, which ask students to assess or verify a result; and reflective directives, which encourage students to reconsider or explain their reasoning.

These categories indicate that directive language in engineering education is not limited to simple commands. It can also be used to organize students' analytical activities and guide their engagement with technical problems. However, because the present study did not analyze a complete corpus of classroom interaction, these categories should be understood as functional patterns represented in the documentary materials rather than as evidence that one directive type occurs more frequently than another.

Representative Expressions and the Construction of Engineering Knowledge

Representative expressions were identified in the documentary materials as language used to present information, describe technical conditions, define concepts, and explain relationships among engineering phenomena. Their function is particularly relevant to

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scientific communication because engineering knowledge requires propositions that can be described, explained, examined, tested, and discussed.

The analysis indicates that technical explanations represented in the documents can be understood through a sequence connecting data, interpretation, argumentation, and conclusion. This sequence illustrates the role of language in transforming technical information into an organized academic explanation. A technically accurate term or statement therefore does not automatically constitute a complete scientific argument; its meaning and function depend on how it is connected to evidence and reasoning.

The finding reinforces the importance of examining language not only at the level of grammatical correctness but also at the level of knowledge construction. Indonesian functions as a medium through which engineering students can represent relationships between empirical information and technical interpretations.

Interrogative Expressions and Reasoning

Interrogative expressions represented in the analyzed materials serve functions beyond the simple retrieval of answers. They are associated with the presentation of problems, requests for explanation, examination of technical relationships, and development of reasoning.

The documentary evidence indicates that questions can direct attention toward particular aspects of an engineering problem. A question may request a factual response, ask for an explanation of a process, require justification of a result, or encourage examination of an alternative interpretation. Consequently, the pragmatic function of an interrogative expression depends on its communicative purpose and its position within the learning activity.

These findings demonstrate that questions form part of the linguistic mechanisms through which technical knowledge is explored and communicated. The result also supports the view that academic communication involves not only accurate language forms but also the strategic use of language to organize reasoning.

Clarificatory Expressions and Negotiation of Meaning

Clarification emerged as another relevant pragmatic function represented in the engineering learning materials. Engineering concepts frequently involve specialized terminology, abstract relationships, mathematical representations, and procedural explanations. Such characteristics create opportunities for ambiguity or differences in interpretation.

Clarificatory expressions function to establish or restore shared understanding. They may involve requests for additional explanation, reformulation of technical information, specification of a term, or confirmation of an interpretation. In the context of engineering education, clarification is particularly relevant because an inaccurate interpretation of a technical concept may affect subsequent analysis or problem-solving.

The finding suggests that pragmatic competence in Technical Indonesian includes the ability to recognize when clarification is necessary and to formulate clarification appropriately within an academic interaction. Nevertheless, this conclusion concerns the

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pedagogical relevance of the documented function and should not be interpreted as a measurement of students' actual clarification competence.

Evaluative Language and Academic Politeness

The analyzed materials also represent evaluative language associated with feedback, correction, assessment, and responses to academic work. Evaluation is an important component of engineering education because students' technical explanations, calculations, reports, presentations, and practical work require responses concerning both accuracy and quality.

Evaluation also has an interpersonal dimension. Although technical discourse tends to emphasize objectivity and precision, educational communication occurs within relationships between lecturers and students. Corrections and critical feedback can therefore perform both an evaluative function and an interpersonal function.

Previous research supports the relevance of politeness in lecturer–student communication. Sudrajat et al. [7] identified various politeness strategies used by lecturers toward students, while Tubi et al. [8] and Eksan et al. [9] highlighted the importance of politeness in student–lecturer communication. Within the present study, these findings provide a comparative basis for interpreting the interpersonal dimension of evaluative and corrective language represented in the engineering education context.

Because the documentary corpus does not contain a systematically sampled collection of lecturer–student conversations, however, the study does not claim to identify or compare specific politeness strategies as interactional frequencies. Instead, politeness is treated as a relevant pragmatic dimension for understanding the communicative context of technical education.

Technical Indonesian and Academic Literacy

The documentary findings indicate a close relationship between Technical Indonesian and academic literacy. Engineering students are expected to engage with scientific sources, prepare academic reports, present technical information, formulate explanations, and communicate research findings. These activities require language competence that extends beyond knowledge of individual technical terms.

Technical Indonesian therefore operates across several academic literacy practices, including reading technical information, interpreting concepts, writing reports, constructing explanations, presenting findings, and communicating arguments. The linguistic requirements of these activities are inseparable from the engineering knowledge being communicated.

This finding is consistent with the broader relationship between language and disciplinary learning. Indonesian does not function merely as an additional subject alongside engineering courses; it also provides a medium through which engineering knowledge can be articulated, organized, and communicated.

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Terminological Accuracy and Indonesian Spelling

The documentary analysis also highlights the importance of terminological consistency and standard Indonesian writing conventions in technical communication. Engineering documents require accurate use of technical terms because inconsistencies in terminology may create ambiguity or alter the interpretation of specialized concepts.

Relevant language features include Indonesian spelling conventions, technical term formation, diction, effective sentence construction, scientific paragraph organization, argument structure, writing of numbers and measurement units, table and figure presentation, citation practices, and bibliography. These elements connect linguistic accuracy with the conventions of scientific communication.

The importance of linguistic accuracy in engineering writing is also supported by Sucipta's findings [1], which identified spelling-related problems in Electrical Engineering students' papers. The present documentary findings extend this concern by placing linguistic accuracy within the broader context of technical communication and disciplinary knowledge representation.

Indonesian as a Bridge between Engineering Concepts and Practices

One of the conceptual findings emerging from the documentary analysis is the role of Indonesian as a bridge between abstract engineering concepts and their practical representation. Technical knowledge often involves relationships among concepts, mathematical expressions, procedures, observations, and practical applications. Language provides a means of connecting these elements into explanations that can be communicated and interpreted by learners.

This relationship is also reflected in previous research by Batahan et al. [10], which indicates that the use of Indonesian can support the academic understanding of Electrical Engineering students. In the context of the present study, Indonesian can consequently be understood as part of the process through which engineering knowledge is articulated, explained, and connected to academic and practical activities.

However, the present study does not establish a causal relationship between Indonesian language competence and engineering achievement. Rather, the finding demonstrates the communicative role represented by Indonesian within engineering learning and provides a basis for considering its pedagogical integration.

Summary of Documentary Findings

Overall, the documentary analysis identified six interconnected pragmatic characteristics represented in Technical Indonesian: technical terminology, directive expressions, representative expressions, interrogative expressions, evaluative expressions, and clarificatory expressions. These characteristics demonstrate that Indonesian in engineering education performs multiple communicative functions associated with the representation, explanation, organization, evaluation, and clarification of technical knowledge.

The findings also indicate three interconnected dimensions of Technical Indonesian competence: term mastery, referring to knowledge and appropriate use of specialized

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terminology; concept mastery, referring to the ability to connect terminology with engineering concepts; and pragmatic use, referring to the ability to use language in accordance with communicative purposes and contextual requirements.

The findings provide an empirical and conceptual basis for the development of a learning model that integrates linguistic, terminological, pragmatic, and scientific dimensions. The formulation and pedagogical implications of this model are discussed in the following section.

3.2 Discussion

The Pragmatic Position of Technical Indonesian in Engineering Education

The findings indicate that the use of Indonesian in engineering education cannot be understood solely in terms of grammatical accuracy, terminology, or compliance with spelling conventions. In the context of Institut Teknologi PLN (ITPLN), Indonesian functions as a medium through which technical concepts are explained, questioned, clarified, evaluated, and communicated within academic settings. This finding extends previous discussions of Indonesian language use in engineering education, which have primarily emphasized academic literacy, language accuracy, and students' understanding of academic materials [3], [5]. From a pragmatic perspective, however, effective technical communication also depends on the relationship between linguistic form, communicative intention, context, and the expected response of the interlocutor.

This interpretation is consistent with the fundamental view of pragmatics as the study of meaning in relation to context and language use. In academic communication, the same linguistic form may perform different functions depending on the communicative situation. A question, for example, may function not only to request information but also to seek clarification, check understanding, or challenge an explanation. Similarly, a declarative statement may function as an explanation, evaluation, or implicit instruction. Such distinctions are important in engineering education because technical communication frequently requires speakers and writers to move between explaining concepts, presenting evidence, interpreting results, and directing procedural activities [22].

The finding therefore suggests that the concept of "Technical Indonesian" should not be treated as an entirely separate language variety. Rather, it can be understood as a working pedagogical concept referring to the use of Indonesian for communicating engineering knowledge and performing academic and technical communicative functions. This position is compatible with the concept of language for specific purposes, in which language practices are shaped by the communicative needs and discourse practices of a particular academic or professional domain [20]. Thus, Technical Indonesian involves an intersection between academic Indonesian, technical terminology, disciplinary discourse, and pragmatic competence.

Pragmatic Functions in Engineering Academic Communication

The six pragmatic characteristics identified in the findings—context sensitivity, directive communication, representation of technical knowledge, clarification, evaluation and politeness, and the connection between conceptual and practical knowledge—indicate

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that technical communication involves more than the transfer of information. These characteristics describe communicative functions represented in the institutional documents examined in this study. They should therefore be interpreted as pedagogically relevant pragmatic dimensions rather than as a statistical classification of speech acts occurring in ITPLN classrooms.

The importance of contextual interpretation is particularly relevant because pragmatic meaning is not determined exclusively by linguistic structure. The interpretation of an utterance depends on the communicative situation, the relationship between participants, the intended purpose, and the knowledge shared by the participants. Previous pragmatic research similarly emphasizes that pragmatic competence involves selecting and interpreting language appropriately according to context [6], [7]. In engineering education, contextual sensitivity is particularly important because technical terms and explanations are often used in situations involving problem solving, laboratory procedures, project discussions, reports, and presentations.

This finding also complements research on technical communication pedagogy, which emphasizes that students in technical disciplines need to develop communication abilities alongside disciplinary knowledge [1]. Engineering students may possess adequate conceptual knowledge but still experience difficulty communicating that knowledge effectively if they cannot select appropriate terminology, organize explanations, formulate questions, or respond appropriately to feedback. Consequently, language instruction in engineering education should not be separated completely from disciplinary learning.

Directive Communication and Classroom-Oriented Pragmatic Competence

Directive communication emerged as one of the particularly relevant pragmatic functions in the documents analyzed. In academic and technical settings, directives may be associated with instructions, requests, recommendations, procedures, or prompts to perform a particular activity. Their function is therefore closely connected to the procedural nature of engineering education.

This interpretation is supported by research on Indonesian classroom discourse, which demonstrates that directive speech acts may perform several functions, including requesting, advising, commanding, permitting, and prohibiting [25]. The pragmatic meaning of a directive is consequently influenced by how it is formulated and by the relationship between the participants. A direct imperative, for example, may communicate an instruction efficiently, whereas an interrogative or mitigated expression may reduce the force of the directive and create a more collaborative interaction.

The implication for Technical Indonesian is that students need to understand not only the linguistic forms of directives but also their appropriate use in academic and professional contexts. A student writing a laboratory procedure, presenting a project recommendation, or communicating a technical instruction needs to distinguish between expressions that function as commands, recommendations, requests, or suggestions. Such distinctions contribute to pragmatic competence because they involve selecting language according to communicative goals and contextual expectations.

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This interpretation is also consistent with studies of academic speech acts, which demonstrate that directives and other speech-act categories are important mechanisms for managing academic communication [21]. However, because the present study relies on institutional documents rather than recorded classroom interaction, the findings do not establish the frequency or distribution of directive forms among ITPLN lecturers or students.

Representatives and the Communication of Technical Knowledge

Representative functions are particularly important in engineering education because much academic communication involves stating propositions, explaining concepts, describing procedures, reporting observations, and presenting conclusions. In this sense, language serves as a mechanism for representing disciplinary knowledge.

The findings indicate that Indonesian is not merely a medium for expressing already established technical knowledge. It also supports the processes through which students organize, explain, and communicate their understanding of engineering concepts. This observation is consistent with previous research showing the relationship between Indonesian language learning and academic understanding among engineering students [5]. Similarly, research on Indonesian language instruction in civil engineering contexts emphasizes the importance of language competence for supporting academic literacy [3].

From a pragmatic perspective, the representative function requires students to consider the relationship between what is being stated and the evidence or knowledge supporting the statement. In technical communication, statements should be sufficiently precise and appropriately qualified. Students therefore need to distinguish, for example, between reporting an observed result, interpreting a result, proposing an explanation, and making a conclusion. These differences are not purely grammatical; they involve communicative intention and the epistemic status of the information being presented.

Accordingly, pragmatic competence in Technical Indonesian can contribute to students' ability to communicate technical knowledge responsibly. The pedagogical emphasis should not be limited to whether an Indonesian sentence is grammatically correct, but should also consider whether the statement accurately represents the intended technical meaning and is appropriate for its communicative context.

Clarification as a Mechanism for Managing Technical Meaning

Clarification represents another important pragmatic dimension because technical communication frequently involves concepts, symbols, procedures, and terminology that may be interpreted differently by participants. In such situations, asking for clarification, restating an explanation, defining a term, or checking understanding becomes part of the communication process.

The importance of clarification can be related to previous research on classroom speech acts, which identifies questioning and clarification as functions that contribute to the management of classroom interaction [27]. Clarification is particularly relevant to engineering education because misunderstandings may arise not only from general language difficulties but also from the specialized meanings of technical terminology.

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The findings therefore suggest that Technical Indonesian instruction should provide opportunities for students to practice pragmatic strategies for dealing with uncertainty and misunderstanding. These strategies may include asking for repetition, requesting a more precise explanation, confirming the meaning of a technical term, paraphrasing an explanation, and checking whether an interpretation is correct. Such practices support interactional competence because students learn how to manage meaning rather than simply receive information.

This interpretation also strengthens the distinction between terminology mastery and pragmatic use. Knowing the meaning of a technical term does not necessarily mean that a student knows when to ask for clarification, how to formulate a clarification request, or how to reformulate an explanation for a particular audience.

Evaluation, Politeness, and Academic Relationships

The findings further indicate that evaluation and politeness constitute important dimensions of Technical Indonesian. Engineering education involves various evaluative activities, including feedback on assignments, assessment of project results, discussion of technical alternatives, correction of errors, and responses to presentations. These activities require participants to communicate judgments while maintaining appropriate academic relationships.

Previous research on Indonesian academic communication has demonstrated the relevance of politeness in lecturer–student interactions [12]–[14]. Research in classroom settings has likewise shown that politeness can be realized through different speech-act forms and strategies, including direct and indirect expressions [28]. These findings support the interpretation that politeness is not merely an additional social feature of communication but can influence how academic intentions are conveyed and received.

In technical contexts, politeness must be balanced with precision. Excessive indirectness may make a technical instruction or evaluation ambiguous, whereas excessively direct language may create unnecessary interpersonal tension. Pragmatic competence therefore involves finding an appropriate balance between clarity and interpersonal consideration. For example, feedback on a technical error should communicate the problem accurately while allowing the recipient to respond constructively.

This dimension is consistent with Leech's account of politeness as a pragmatic consideration in interpersonal communication [16]. It also corresponds with contemporary research showing that speech acts and politeness strategies are closely related to the management of academic communication [28]. Nevertheless, the present study does not claim that particular politeness strategies are quantitatively dominant at ITPLN because such a conclusion would require direct interactional data.

The Relationship between Language, Terminology, and Conceptual Understanding

Another important finding is the close relationship between linguistic competence and technical conceptual understanding. Previous studies at engineering institutions have identified problems related to Indonesian language use, including spelling and academic writing [2], while other studies have emphasized the role of Indonesian language learning in

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improving students' academic literacy and understanding [3], [5]. The present findings extend this perspective by emphasizing that terminology should be considered together with pragmatic use.

Technical terminology is necessary for precision, but terminology alone does not guarantee effective communication. Students need to understand how terms are introduced, defined, compared, explained, and applied in context. A technically correct term can still produce communication problems if it is used without sufficient contextual explanation or if its intended meaning is not shared by the audience.

This finding is particularly relevant to engineering education because students frequently move between specialized disciplinary terminology and more general explanatory language. They may need to explain a technical concept to a lecturer, fellow student, or non-specialist audience. Such communicative situations require flexibility in language use and an awareness of the audience's knowledge.

Therefore, Technical Indonesian can be viewed as involving at least three interconnected competencies: mastery of technical terminology, mastery of the underlying engineering concept, and pragmatic ability to use language appropriately for a particular communicative purpose. This three-level relationship provides a more comprehensive perspective than treating language accuracy and terminology as separate learning objectives.

Implications for Pragmatic Pedagogy in Engineering Education

The findings have pedagogical implications for Indonesian language instruction in engineering education. Pragmatic competence should be integrated with academic literacy and technical communication rather than treated as an independent linguistic component. Previous research on pragmatics instruction emphasizes the importance of explicit attention to pragmatic forms, functions, contexts, and communicative strategies [26]. Similarly, task-based approaches to pragmatics suggest that pragmatic knowledge can be developed through meaningful communicative activities rather than through decontextualized language exercises [24].

Based on the findings, the proposed "Pragmatic Model of Technical Indonesian" can therefore be understood as a pedagogical framework rather than an empirically validated instructional model. The framework consists of five interconnected stages: (1) contextualization, (2) technical-term exploration, (3) pragmatic analysis, (4) technical communication production, and (5) evaluation.

At the contextualization stage, students are introduced to an authentic or simulated engineering communication situation. The second stage focuses on identifying and understanding relevant technical terminology. In the third stage, students examine how linguistic expressions perform particular communicative functions, such as explaining, requesting, clarifying, evaluating, or recommending. The fourth stage requires students to produce technical communication, such as explanations, reports, presentations, procedures, or project recommendations. Finally, evaluation considers linguistic accuracy, terminology, pragmatic appropriateness, and scientific or technical accuracy.

This framework is consistent with the broader principle that pragmatic competence develops through awareness of the relationship between linguistic forms, communicative

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functions, and context [7]. It also complements the need for technical communication pedagogy in higher education, where disciplinary knowledge and communication skills need to be developed together [1].

Theoretical Contribution

The main theoretical contribution of this study lies in positioning Technical Indonesian at the intersection of disciplinary language, academic literacy, and pragmatics. Previous studies have examined Indonesian language accuracy, academic literacy, speech acts, and politeness in relatively separate contexts [2], [3], [8]–[14]. The present study brings these dimensions together within the context of engineering education.

The proposed perspective does not suggest that Technical Indonesian constitutes a new autonomous language variety. Instead, it provides a conceptual lens for examining how Indonesian is used to perform technical and academic communicative functions. In this framework, linguistic accuracy represents only one component of effective communication. Pragmatic appropriateness, terminology, conceptual accuracy, and audience awareness are equally relevant to the communication of engineering knowledge.

This perspective also reinforces the relevance of pragmatics beyond second- or foreign-language learning. Pragmatic competence has often been discussed in relation to additional-language development [6], [17], [18]. The present study suggests that pragmatic principles can also be productively applied to Indonesian-medium disciplinary education, particularly when students must use language to communicate specialized knowledge in academic and professional environments.

Limitations and Directions for Further Research

The interpretation of these findings should be considered in light of the study's documentary design. The empirical corpus consists of institutional documents, while secondary literature is used to contextualize and interpret the findings. The study does not contain audio or video recordings of classroom interaction and therefore cannot establish the actual frequency, distribution, or dominance of particular speech acts among ITPLN lecturers and students.

Future studies could address this limitation through direct observation and recording of engineering classrooms, laboratory sessions, academic presentations, project meetings, or lecturer–student consultations. Such studies could examine naturally occurring utterances and compare pragmatic functions across different engineering disciplines, academic activities, and participant roles. Quantitative corpus analysis could subsequently be used to determine the distribution of speech-act categories, while qualitative interactional analysis could explore how pragmatic meaning is negotiated in specific contexts.

Further research could also investigate whether explicit instruction in pragmatic aspects of Technical Indonesian improves students' ability to communicate engineering concepts. Experimental or quasi-experimental studies could compare conventional Indonesian language instruction with instruction integrating contextualized pragmatic activities. Such research would provide empirical evidence for evaluating the pedagogical framework proposed in this study.

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4. CONCLUSION

The analysis suggests that Technical Indonesian in engineering education at Institut Teknologi PLN (ITPLN) has a broader function than merely delivering instructional materials. Indonesian serves as a medium for knowledge formation, reasoning, instruction, conceptual clarification, argumentation, evaluation, and professional communication. The analysis also suggests that Indonesian language learning in technical higher education may benefit from a contextual, pragmatic, and discipline-based approach, in which students are expected not only to use Indonesian correctly but also appropriately when explaining engineering concepts and communicating technical information. In the ITPLN context, this approach can be integrated with engineering-related materials through case studies, practicum reports, technical presentations, scientific writing, project activities, and professional communication simulations. The conceptual contribution of this study is the proposed Pragmatic Model of Technical Indonesian, consisting of contextualization, technical-term exploration, pragmatic analysis, technical communication production, and evaluation. This model is presented as a conceptual pedagogical framework rather than an empirically validated instructional model.

This study has several limitations. It does not include direct classroom observation or lecturer–student interaction transcripts and relies primarily on institutional documents and secondary literature. Therefore, the findings cannot establish the actual frequency, distribution, or dominance of pragmatic patterns in naturally occurring ITPLN interactions. The evidence specific to ITPLN is also limited, and the proposed Pragmatic Model has not yet been empirically tested. Future research should examine authentic classroom discourse, student presentations, laboratory instruction, lecturer feedback, LMS communication, and technical writing to validate and refine the framework. Comparative research across electrical, mechanical, civil, and information-technology engineering would also be valuable to determine whether pragmatic patterns vary across disciplinary contexts.

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