IT Term Translation in Educational Text: A QQ Study

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Abstract. The use of Information Technology (IT) is largely determined by the understanding of technical terms in the IT field. IT terms in educational texts come from English which are used to support the learning process in the IT field. Determining the translation method for IT terms need to consider the category of terms and factors that influence the optimization of IT utilization for students in supporting daily learning activities. The translation of IT terms in this study was to determine the category of terms and student preferences for translation methods that are easy for students to understand to utilize science and technology optimally. This study aimed to analyze the translation method for IT terms in educational texts into Indonesian, as well as the factors that influence the selection of these methods. A qualitative-quantitative approach with thematic inductive analysis methods, with corpus data as a method of confirming non-numerical data in this study. The results of the study showed that translation tended to use a combination of semantic and communicative translation methods by considering the context, target readers, and level of formality of the text. In addition, it was found that the ease of understanding, cultural factors and technological developments also influenced the selection of translation methods.

Keywords: Information Technology (IT), technical terms, translation method

1 Introduction

The rapid development of information technology (IT) has significantly impacted various aspects of life, including education. In Indonesia, English-derived IT terms are increasingly used in both industry and education. Educational textbooks that used IT terms in English are increasingly used as learning resources at various levels of education. However, the translation of these terms into Indonesian often poses challenges, leading to confusion, especially when literal translations do not consider the cultural and linguistic context. For instance, terms like “cloud computing” and “firewall” which was semantically translated as “*tembok api*” can cause misunderstanding when directly

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translated without further explanation. This highlights the need for IT translations that not only maintain technical accuracy but are also easily understood within the Indonesian context. In this regard, the use of semantic, communicative, and combined translation approaches becomes crucial. The semantic method ensures accuracy, while the communicative approach focuses on clarity for non-technical readers. A combined approach balances both aspects to achieve an effective translation that is both accurate and accessible.

In addition to these phenomena, the presentations of linguistic predecessors indicate an ongoing debate in the translation of technical terms, especially in the IT context. Future research could utilize these insights to develop better methods in maintaining the balance between technical accuracy and cultural adaptation, and address the challenges of globalization in technical translation. Baker (2018) explored translation methods, including the risks of over adaptation, which can dilute the technical precision of specialized terms. Her work critiques the balance between communicative methods and the need for accuracy in technical fields like ICT. Nida & Taber (1982) introduced the concept of dynamic equivalence, advocating for translations that prioritize the target culture's understanding and function of the text, sometimes at the expense of technical detail. This approach contrasts with more semantic methods that prioritize technical accuracy. Venuti (2000) discussed the impact of globalization and technological determinism on translation practices, arguing against the overshadowing of cultural and contextual adaptation by standardized global translation practices, which is particularly relevant to ICT translation. These works provided a broader context for the ongoing debates in translation studies, particularly in how different methods were applied to the translation of technical and specialized content such as ICT terminology. Olohan (2015) highlighted the role of high-quality translations for various types of documents, from product manuals to patents. The complexity of technical translation often involves very specific terminology, as well as high quality requirements to ensure the security and accuracy of information. With the rapid increase in technical publications, the number of new products and technologies being launched, the need for accurate and fast technical translations is increasing.

These expert statements suggested that future research on the study of ICT term translation needs to strike a balance between technical accuracy and cultural relevance. Nida & Taber (1982) emphasizes cultural adaptation through a communicative approach, while Olohan (2015) highlighted the role of high-quality translations for various types of documents, from product manuals to patents. Baker (2018) warns against the risk of over-adaptation at the expense of technical precision, and Venuti (2000) criticizes global standards that can ignore local cultural nuances. Future research should explore ways to integrate these methods, in order to produce ICT translations that are not only technically accurate, but also relevant and accessible to the target audience's culture and context.

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The translation theory from Newmark (1988) presents a V-diagram with eight translation methods, highlighting semantic and communicative translation. Semantic translation is flexible, allowing creative exceptions for fidelity and fostering the translator's empathy with the original text. It emphasized lexical and grammatical accuracy while considering the text's aesthetic qualities, facilitating a natural flow in the target language. In contrast, communicative translation focuses on reader comprehension and impact. Combining both methods helps translators produce translations that are both faithful to the source and effective in educational contexts. Newmark (1988) illustrates this with the example of translating *une nonne repassant un corporal* in showing how semantic translation prioritizes functional clarity over cultural equivalency, ultimately balancing fidelity and effectiveness.

Wang (2019) explores how Newmark's theories are applied in translation practices, particularly in balancing the accuracy of semantic translation with the reader-focused approach of communicative translation. This framework is often used in research to analyze translation methods in various contexts, including technical and specialized content like ICT terminology. Wang's study, titled *Exploring Newmark's Communicative Translation and Text Typology* (2019), explores how Newmark's theories are applied in translation practices, particularly in balancing semantic accuracy and communicative readability. He highlights the challenges of maintaining semantic precision while using a communicative approach, especially in translating technicalfu content like ICT terminology. Wang continues to discuss how communicative translation focuses on readability and cultural relevance but can risk losing technical accuracy. For instance, translating "algorithm" as "problem-solving steps" might make the term more understandable to a general audience but could sacrifice its precise technical meaning. Wang's research emphasizes the importance of applying Newmark's text typology to achieve a balance between these approaches, especially in specialized fields. Wang (2019, p. 137) stated that examining the outcome of research that the research findings suggested that in translating ICT terms, a balance between technical accuracy (semantics) and readability (communicative) is crucial.

2 Review of Literature

This literature review provided an overview of previously conducted research and serve as a basis for formulating research problems. There are some references were citated in the review of literature was as follows.

2.1 IT Term

This subsection discusses Information Technology (IT) and the importance of IT terms in global communication. Chaer (2005) defines terms as words with fixed meanings specific to certain fields, requiring deep understanding for translation. According to (KBBI, 2008) the definition of "technology" is a scientific method for practical goals and "information" as news or reports. Woodhull & Tanenbaum (2014) emphasize IT's role in modern life for processing and storing information, while Munday & Chandler (2016) associate IT with computers and networks for managing information. The study highlighted IT role in education and the challenges of translating specialized IT terms from English to Indonesian, stressing the need for precise translation to support student understanding.

The concept of the specific term IT in this study, contributed very importantly to the development of knowledge in the field of Education, supported the exchange of information and global communication based on IT, helped facilitate students' understanding of IT studies and utilized technology efficiently and appropriately.

2.2 IT Term Translation

Previous research has shown that translating IT terms often faces challenges related to finding suitable equivalents and maintaining terminological consistency. Moir (2020) analyzed how translators handle evolving IT terms and maintain consistency, particularly in a digital age. Wu (2015) examined the issues of term equivalence and the impact of cultural context, technological development, and readers' education levels on translation. Many IT terms lack standardized equivalents in Indonesian, leading to variability in meaning. Hernández (2018) explored how cultural context and technological advances influence technical term translation, emphasizing the need for adapting translations to these factors.

The basic considerations for translating the term IT as a research concept were generally seen from things such as: (1) obstacles to the lack of equivalent words, rapid technological developments, and differences in cultural context, and (2) external factors: context of use, target readers, and translation objectives. This concept should be applied through translation methods, such as: (1) understanding the context of the use of terms in the source text, (2) finding the most appropriate equivalent words, both lexically and contextually, (3) considering the target reader, by adjusting the language according to the reader's level of understanding, and (4) maintaining consistency in the use of the same terms throughout the translated text. These considerations were as applied to the example of the English term "cloud computing" translated into Indonesian, like shown in Table 1 below.

Table 1. Table Basic Considerations for Translation of IT Terms

Translation of "cloud computing" (into Indonesian)	
Translation options:	a) Komputasi awan (KBBI.web.id.) b) Hitung komputasi berbasis awan c) Layanan komputasi berbasis awan
Factors affecting:	a) Context: If used in a business context, "*komputasi awan*" may be more appropriate. b) Target Reader: If the target reader is a lay person, "*layanan komputasi berbasis awan*" may be more understandable.

The translation of IT terms in this study considered factors like context, target readers, and objectives in selecting the appropriate translation method. (Newmark, 1988) theory guided the exploration of IT term forms and translation methods used in English educational textbooks translated into Indonesian.

Huang (2023) emphasized the importance of combining semantic, communicative, and adaptive methods in translating ICT textbooks. For example, the term "Artificial Intelligence" was translated with additional explanations to balance technical accuracy and readability. Meanwhile, Chen (2020) and Wang (2019) explored how semantic and communicative methods were applied to ICT terms. "Firewall" was translated semantically for technical precision, while communicative strategies, like footnotes, ensured reader comprehension. Their studies highlighted the effectiveness of combining these methods to balance accuracy and accessibility for educational purposes.

2.3 Semantic Translation and Communicative Translation Approaches

Newmark (1988) proposed two key translation approaches: semantic translation and communicative translation. Semantic translation emphasizes accuracy in lexical and grammatical meaning, aiming for close fidelity to the source text. In contrast, communicative translation focuses on delivering the same effect on the target audience, ensuring readability and cultural relevance.

Table 2. Table Translation of Source Text - Target Text

Source Text (English)	**Target Text (Indonesian)**	
	Semantic Translation	**Communicative Translation**
"The software has a user-friendly interface"	*"Software tersebut memiliki antarmuka pengguna yang ramah"*	*"Perangkat lunak ini mudah digunakan"*(: adapts terms "easy-to-use interface")
"Firewell"	*"Tembok api" (The most semantically correct literal translation)*	-

"Cloud Computing"	-	*"Komputasi awan" (an easier translation for lay readers to understand)*

Barlow (2021) highlighted challenges in translating IT terms, noting how cultural context and reader education levels influence translations. Semantic translation seeks precise equivalents, such as translating "software" as "software" in Indonesian. Meanwhile, communicative translation adapts terms for easier understanding, like translating "user-friendly interface" as "easy-to-use interface." These methods often involve adjustments such as transposition or modulation to ensure the text is both accurate and accessible. The table 2 above is an example of the application in translating the sentence "The software has a user-friendly interface" into Indonesian.

The two theoretical frameworks above provided a better understanding of the complexities in translating IT terms. In IT terminology translation, the choice between semantic and communicative translation depended on the purpose and audience of the text. Semantic translation preserved the original meaning and specific terminology, which was important for technical texts or expert readers. On the other hand, communicative translation aimed to convey meaning in a more understandable way, which was important in texts intended for a wider audience or lay readers.

2.4 Combined Approach to Translation Methods

A combined method in translation integrates both semantic and communicative approaches to achieve a balance between accuracy and readability. Newmark (1988) recognized that translators often cannot rely on just one method, and instead, combine them for effective translation. For example, in translating technical terms, a translator might start with transliteration (semantic element) to preserve the original meaning, then add explanations or adapt the term (communicative element) for clarity.

In educational contexts, such as translating "Machine Learning," a hybrid method ensures both fidelity to the original and understandability for students. By providing local examples, like its use in e-commerce, the method bridges gaps between languages and enhances comprehension.

Against this background, this study examined these three strategic approaches in translating IT terms from English educational textbooks into Indonesian. This study aimed to identify the forms of IT terms, the translation methods used, and the impact of the chosen methods on the perception and acceptance of IT terms by readers in local communities.

3 Method

The mixed-methods design in this study combined qualitative and quantitative (QQ) approaches, as outlined by Creswell & Cresswell (2018) to address the research problem comprehensively. First, a qualitative analysis was conducted on educational texts, focusing on IT terms from both Source Language (SL) and Target Language (TL) academic textbooks. Data collection involved document analysis, where IT terms were

broken down into smaller units, coded, and grouped into categories. These categories were synthesized into larger themes, verified through corpus analysis and raw data.

Following this, a quantitative survey was conducted on students' perceptions of IT terms. This involved an initial smaller sample, followed by a larger participant group to capture more specific views. The combination of both QQ methods allowed for a deeper and more complete understanding of IT terminology translation, generalizing findings while also providing detailed insights into student perceptions.

3.1 Type of Research

This study adopted a QQ approach with inductive analysis, moving from general patterns to specific thematic patterns, in accordance with the explanation of Creswell & Creswell (2018). This approach is supported by a quantitative confirmation method to track the frequency of occurrence of corpus data in IT terminology, which allows for a more in-depth qualitative analysis without an intensive focus on numerical data. Vagias (2006) added that a Likert scale was used to measure student preferences, both majority and minority, with the results presented in tables so that differences in respondent opinions become clearer (Evergreen, 2019). By combining QQ analysis, this study is able to explore translation patterns and students' perceptions of translation methods in educational texts comprehensively.

3.2 Research Subject

In accordance with the research approach presented above, which includes frequency analysis of corpus data and measurement of student preferences using a Likert scale, will provide a deeper understanding of student perceptions of IT term translations in textbooks. Therefore, the subjects of this study involved a population of around 90 students from the Faculty of IT, with samples taken from classes A and B, each consisting of 30 local students from the IT Department at the Indonesian Institute of Business and Technology. English textbooks and Indonesian translated books became the subjects of this study, where class A was chosen as the superior class to be studied further. By focusing on local students and analyzing textbooks, this study aims to identify translation patterns and preferences for the translation methods applied, thus supporting more transparent and accurate results.

3.3 Research Procedure

This study applies data collection, processing, analysis, and presentation techniques that refer to translation research as part of language research (Creswell & Creswell, 2018; Munday & Chandler, 2016), which emphasizes the use of corpus data. The IT term translation research uses a qualitative-quantitative (QQ) method with the following steps:

Observation: Conducting observations on IT education textbooks in English (SL) and Indonesian (TL) to collect relevant corpus data on technology terms.

Questionnaire: Distributing questionnaires to measure students' preferences for types of IT terms and translation methods that are easier to understand using a Likert scale.

Text Analysis: Analyzing translated texts to identify IT terms and translation methods used and recording additional information during observation.

Data Grouping: Grouping data based on class (A and B), term category (conceptual, technical, general), and translation method used (semantic, communicative, or mixed).

Data Analysis: Conducting qualitative analysis to categorize IT terms and quantitative analysis to measure the frequency of use of translation methods.

Data Integration: Combining qualitative and quantitative findings for a more comprehensive understanding.

Data Interpretation and Visualization: Interpreting the results of the analysis by considering the cultural context and reader perceptions, and presenting the data in the form of graphs and charts to visualize the results of student preferences.
This systematic approach ensures that the resulting data can provide deeper insights into student preferences and the quality of translation of IT terms in educational textbooks.

4 Results and Discussions

The results of the analysis showed that various translation methods were used in translating IT terms, included: direct translation (: translated the closest equivalent in meaning, transliteration (: used the original spelling of the term in Indonesian), adaptation (: adapted the term to the Indonesian cultural context), explanation (: provided additional explanations for terms that are difficult to understand), combination of methods (: often combined several methods in one term).

The choice of translation method was influenced by several factors, including: (1) context: the level of formality of the text, the field of science, and the target audience influenced the choice of method. (2) level of specificity of the term: highly technical terms tended to be translated directly or transliterated, while more general terms tend to be adapted. (3) technological developments: rapid technological developments had led to the emergence of new terms that did not yet have standard equivalents in Indonesian.

Observations that have been conducted on 30 students who were members of the superior class from all classes in the IT faculty, included: (1) Student identity: study program, level/semester, foreign language learning experience. (2) Perception of translation: level of ease of understanding terms, clarity of meaning, and relevance to the learning context. (3) Translation method preferences: reasons why students preferred literal (semantic) or easier to understand (communicative) translations.

4.1 Collecting data

The results of this research data collection include IT terms found in textbooks used in classroom learning, including: algorithm, artificial intelligence, microprocessor, router, bandwidth, data, information, and system.

Grouping data. The first data analysis was carried out by grouping the terms based on the IT translation classification found. This grouping includes identifying terms into smaller parts to understand the basic meaning of each, which is divided into three categories: (1) Conceptual Terms: Includes general and basic terms such as algorithm, artificial intelligence, and artificial neural networks. (2) Technical Terms: Includes specific and technical terms in the IT field, namely microprocessor, router, and bandwidth. (3) General Terms: Includes terms that are often used in general contexts, such as data, information, and systems.

Identifying data. Identification of terms was also carried out through a search on (www.english-corpora.id) to see the emergence of various types of IT terms and their translations. This aims to provide a more comprehensive overview of the classification and use of these terms in the context of IT learning. In addition, as seen a comparison of the context of word used in the source text with a similar context in Indonesian, as visualized in the following table.

Table 3. Table A Comparison of word use in SL with TL

English Term	Indonesian Translation	Translation Strategy	Contextual Example
Algoritm	*Algoritma*	Semantic [Direct translation]	*Algoritma memproses untuk menghasilkan informasi*
Data	*Data*	Combined [Direct Translation, widely understood]	*Algoritma memproses untuk menghasilkan informasi*
Information	*Informasi*	Communicative [Direct Translation, with possible explanation]	*Algoritma memproses untuk menghasilkan informasi*

In semantic translation analysis, IT terms were identified and classified into smaller parts to understand the basic meaning of each part. This identification helped in determining the appropriate translation method based on the category and complexity of the term.

Questionnaire. Based on the results of the term classification in this data analysis, 3 things were found, included: (1) conceptual terms tended to be translated with communicative methods that used analogies or metaphors to facilitate student understanding, (2) students with non-IT backgrounds preferred translations that used simpler language and avoided technical terms that were too specific, and (3) translations that were consistent with the use of terms in the context of sentences were easier for students to understand such the following Table 4.

Table 4. Table Grouping The local reader respondents (students)

Num	Activities	SS (5)	S (4)	N (3)	TS (2)	STS (1)	Sum	Explanation
Semantical Translation Strategies								
1.	**Conceptual terms:**							
	a) *algoritms*	-	√	-	√	-	11	11(S); 19 (TS)
	b) *artificial intelligence*	-	√	√	√	-	7	7(S); 3 (N); 20(TS)
	c) *neural networks*	-	√	-	√	-	12	12(S); 18(TS)
2.	**Technical terms**							
	a) *microprocessors*	-	√	√	√	-	26	26(S); 1 (N); 3(TS)
	b) *routers*	-	√	-	-	-	25	25(S); 5(TS)
	c) *bandwidth*	-	√	-	√	-	24	24(S); 6(TS)
3.	**General terms**							
	a) *data*	-	√	-	√	-	15	15(S); 15(TS)
	b) *information*	-	√	-	√	√	13	13(S); 12(TS); 5(STS)
	c) *system*	-	√	-	√	-	17	17(S); 13(TS)
Communicative Translation Strategies								
1.	**Conceptual terms**							
	a) *algorithms*	√	√	√		-	23	16(ST); 13(S); 1(N)
	b) *artificial intelligence*	√	√	-	√	-	21	7(ST); 14(S); 9(TS)
	c) *neural networks*	√	√	-	√	-	26	16(SST); 10(S); 4(TS)
2.	**Technical terms**							
	a) *microprocessors*	-	√	√	√	-	5	5(S); 2(N); 23(TS)
	b) *routers*	√	√	-	-	-	11	7(ST); 4 (S)
	c) *bandwidth*	-	√	-	-	-	9	9 (S)
3.	**General terms**							
	a) *data*	√	√	-	-	-	21	11 (ST); 10 (S)
	b) *information*	√	√	-	-	-	15	9 (ST); 6 (S)
	c) *system*	√	√	-	-	-	19	12 (ST); 7 (S)

These findings were based on a questionnaire survey that used a Likert scale with a 1-5 scoring system. The respondents were local students who were asked to evaluate the

translations of various technical terms. The data was then analyzed to identify patterns and correlations between the type of term, the translation method used, and the perceived ease of understanding.

4.2 Analysis Data

The results of the data analysis of this study are divided into two classifications:

Qualitative analysis. The process of identifying and categorizing IT terms in the source and target texts based on the translation method (semantic, communicative, or mixed). Terms such as algorithm, microprocessor, data, information, and system are categorized as semantic translations, maintaining the original structure and meaning. Other terms such as cloud computing are translated as cloud needs to facilitate student understanding. Observations were made to evaluate students' understanding of these terms and how they reflect the original technical meaning.

Quantitative analysis. Measuring the frequency of use of semantic translations for terms such as algorithm, microprocessor, and system compared to communicative translations for terms such as cloud computing and firewall (translated as *tembok api*). Frequency analysis records how many times each translation method is used in the corpus, showing that bandwidth is more often translated directly compared to communicative translations. Frequency data is presented in a table to illustrate the category of each term.

Table 5. Frequency of Term Categories Against Translation Method Tendencies

Term Categories	Semantic Method	Communicative Method	Combined Method
Konseptual	30	70	35
Teknis	75	25	63
Umum	45	55	57

The frequency analysis was visualized in the form of a table as a descriptive analysis to understand the basic characteristics of the research data, with the main variables were being the characteristics of the observed translation method tendencies including semantic, communicative and combined methods, as well as intervals or categories of terms (conceptual, technical, general) which were groupings of variable values.

4.3 Data Integrated

The research data integration revealed that combining qualitative and quantitative data enhances students' understanding of IT terms. The term “algorithm” is best understood semantically, while “cloud computing” benefits from a communicative translation. The

analysis of "firewall" as "firewall" highlighted student difficulties despite its low frequency.

Frequency data indicates that "information" appears 314,341 times (22.2%), "data" 234,516 times (11.4%), and "algorithm" 11,482 times (0.8%). These terms are crucial for understanding IT concepts and adapting materials to students' needs, demonstrating their interconnectedness in building a comprehensive understanding of information technology.

4.4 Data interpretation

The data interpretation highlighted the need for a balance between semantic and communicative translation methods based on audience and text purpose. It recommended communicative translation for complex terms like "cloud computing" and semantic translation for established terms like "algorithm." The term "firewall" is effectively translated as "*tembok api*," fitting its protective role in IT.

Key findings showed that 70% of students prefer communicative translation for conceptual terms, while 75% prefer semantic translation for technical terms, indicating a value for accuracy. No clear preference exists for general terms, as the choice depends on context and individual preference.

These insights helped determine effective translation methods in education, ensuring IT terms are accessible without sacrificing accuracy, with terms like "algorithm" benefiting from semantic translation and "cloud computing" requiring a communicative approach.

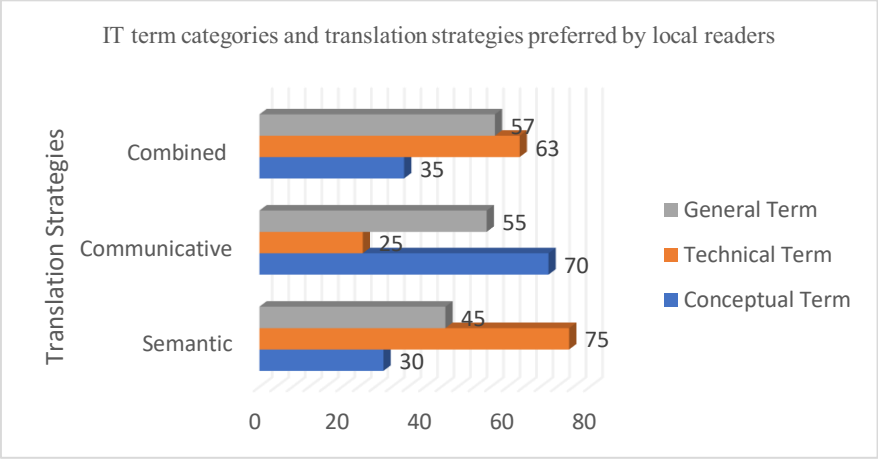

Fig. 1. IT Term Categories and Translation Methods Preferred by Students

4.5 Qualitative Analysis Result

The results of the qualitative analysis of the study show various methods of translating IT terms used, including: (1) Direct (literal) translation: Focusing on maintaining the

original meaning by using the closest equivalent in the target language, reflecting a semantic approach. (2) Transliteration: Using the original spelling in Indonesian without changing the pronunciation, also included in semantic translation. (3) Adaptation: Changing terms to suit the Indonesian cultural context, sacrificing some of the original meaning for better understanding, in line with the communicative approach. (4) Explanation: Adding explanations or footnotes to clarify difficult terms, even though changing the original text. (5) Combined method: Combining several methods in one term, such as literal translation accompanied by explanatory notes. The choice of translation method is influenced by several factors, including the context of the formality of the text, the specifications of technical terms, and rapid technological developments that produce new terms without standard equivalents in Indonesian.

4.6 Quantitative Analysis Results

The results of quantitative analysis of IT term translations showed the frequency of terms used in the concept category based on data from (Corpus of Contemporary American English) included the term "Algorithm" was found with a total frequency of 11,482 times in 3,800 texts, covering 111.4% of the total texts in the corpus. This term appears in two forms: "algorithm" (7,053 times) and "algorithms" (5,429 times). The term "Artificial Intelligence": Its frequency is recorded 7 times in 8 texts. The term "Neutral Network": Found 413 times in 200 texts. These findings showed how often these terms are used in various texts, as well as the variations in their use in the context of modern English.

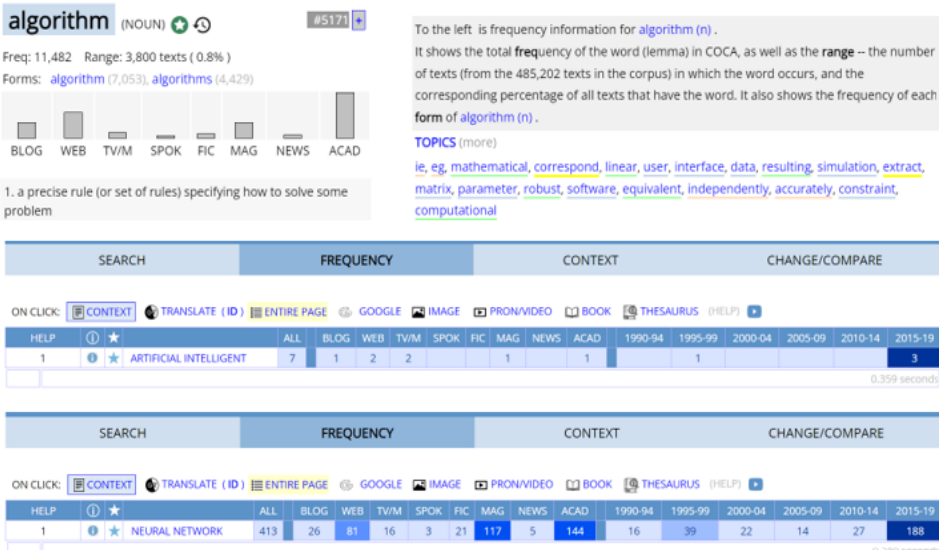

Fig. 2. Conceptual Terms Frequency chart

Fig. 3. Technical Terms Frequency chart

The Technical Terms. These terms of "router" totally frequency: 773; "microprocessor" totally frequency 847, "bandwidth" totally frequency 2905 as seen in the COCA app, as shown in Fig. 3.

The General Terms. The frequency of the term "information" and "data" in the COCA (Corpus of Contemporary American English) corpus shows significant usage. The term "information" appears 314,341 times in 107,717 texts, covering 22.2% of the total texts. There are two forms identified: "information" (314,179 times) and "informations" (140 times), and "in-formation" (22 times). Meanwhile, the term "data" has a frequency of 234,516 times in 55,100 texts, with two forms: "data" (234,501 times) and "datas" (15 times). These findings showed how often these terms are used in various texts and provide an overview of the variation in their use in the context of modern English as showed in Fig. 4.

By comparison of the two versions of QQ analysis data, it showed frequency and coverage: "information" (22.2%) and "data" (11.4%) showed a much higher frequency and text coverage than "Algorithm" (0.8%). This meant that these terms were used more often and were better known by readers as visualized in Fig. 5.

Translation preferences among students revealed distinct trends based on term types: (1) For "information" and conceptual terms, 70% preferred communicative methods, aligning with their high frequency and form variety, emphasizing context and ease of understanding. (2) In contrast, for "algorithm" and technical terms, despite lower frequency (0.8%), 80% favored technical accuracy, highlighting the need for clarity and precision. (3) Regarding "data" and general terms, a combination of semantic and communicative methods (60%) was preferred, reflecting the flexibility of these terms and their substantial text coverage (11.4%).

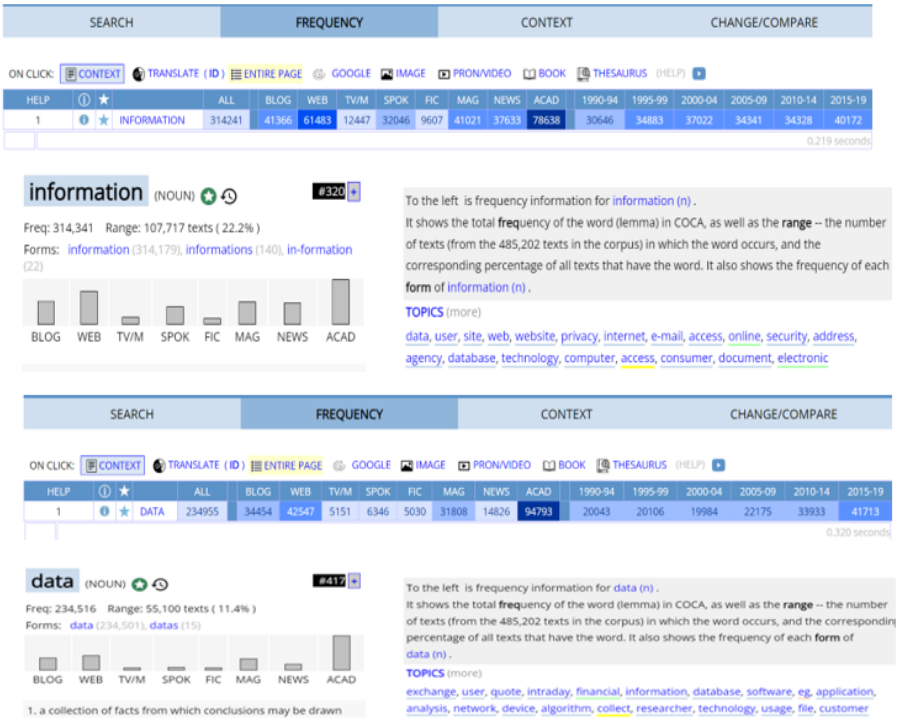

Fig. 4. General Term Frequency chart

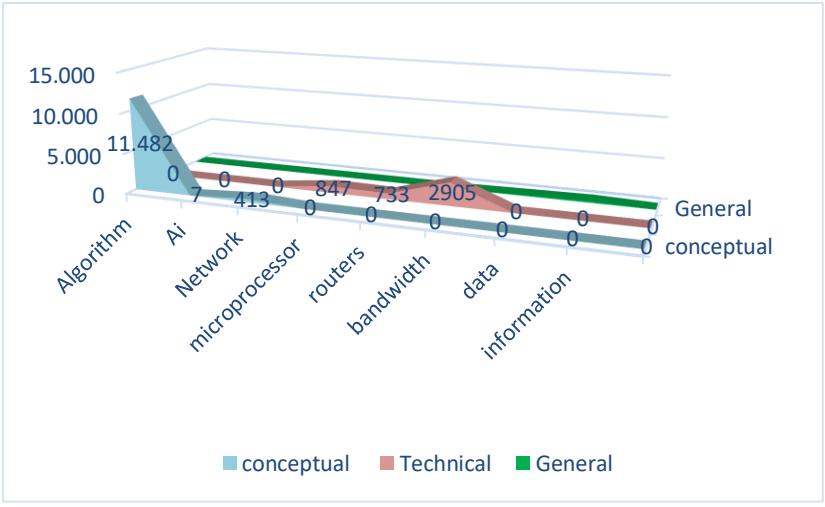

Fig. 5. Comparison QQ Analysis Data Frequency chart

5 Conclusion

The conclusion of this study shows that general terms such as "information" and "data" appear more frequently and require easy-to-understand translation (communicative method), while technical terms such as "algorithm," although less common, require high accuracy in translation according to students' preference for semantic methods. The process of translating IT terms in educational texts is proven to be complex and influenced by various factors, with translation methods tending to combine semantic and communicative approaches, and considering context, target audience, and level of formality. The results of this study have implications for the development of IT term dictionaries and translation guidelines in educational texts, as well as contributing to the advancement of translation science and the quality of educational texts in Indonesia. Further research can involve more types of educational texts and expand the analysis of IT terms, as well as conduct comparative research between English and Indonesian to see the differences in translation methods used.

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