ISSN 2616-5783 Vol.8, Issue 9: 59-64, DOI: 10.25236/AJHSS.2025.080909

A Corpus-Driven Study on the Characteristics of English Vocabulary in Textile Materials

Chen Yonglin[1,a], Zhou Dan[2,b,*], Henry Ming Wang[3,c]

[1]*Hubei Preschool Teachers College, Wuhan, China, 430223*
[2]*School of Foreign Languages, Wuhan Textile University, Wuhan, China, 430200*
[3]*Wuhan Haidian Foreign Language School, Wuhan, China, 430223*
[a]*chenyonglin693@163.com,* [b]*Windy_zhou@163.com,* [c]*1926419507@qq.com*
[*]*Corresponding author*

Abstract: *This paper employs corpus linguistics and cognitive linguistics theories, integrating bibliometric analysis and comparative methods to explore the characteristics of English vocabulary in textile materials. Through systematic analysis of core academic literature in databases such as ScienceDirect and IEEE Xplore, alongside international textile industry standards (e.g., ISO, ASTM), the study examines dimensions including word formation, semantic evolution, syntactic functions, and pragmatic features. Findings reveal that English vocabulary in textile materials exhibits modular and interdisciplinary integration in word formation; dynamic and hierarchical semantic structures; and grammatical patterns adhering to the rigor of scientific English while maintaining industry specificity. This research provides theoretical foundations and practical guidance for international academic exchange, professional terminology standardization, and English teaching reform in the textile materials field.*

Keywords: *Corpus-Driven; English Terminology in Textile Materials; Lexical Characteristics; Collocation Patterns; Semantic Evolution*

1. Introduction

Amid accelerating globalization, international exchanges and cooperation within the textile industry have intensified. As the core vehicle for technical communication in this sector, the specialized and dynamic nature of textile materials English vocabulary directly impacts the accuracy of cross-linguistic information transfer, proving crucial for ensuring multinational production collaboration, technological R&D, and trade interactions (Li Yuting, 2024). [7] However, existing research predominantly focuses on the overall characteristics of English in the textile industry. For instance, while Guo Huifang (2025) systematically elaborated on features such as the "highly specialized nature and close association with manufacturing processes" of textile industry English vocabulary, studies on the lexicon of the specialized field of "textile materials" remain insufficient.[1] Moreover, such research generally lacks support from corpus-based empirical methods, making it difficult to accurately reveal the actual usage patterns of vocabulary in this domain. Meanwhile, corpus linguistics has established a mature paradigm in engineering English lexical research. For instance, Ge Kunyu (2022) employed a corpus-driven phraseology approach using tools like AntConc and WordSmith Tools to analyze high-frequency words and phrase patterns in engineering English, providing a methodological foundation for precise research on specialized English vocabulary in specific domains.[2] Therefore, guided by corpus linguistics theory, this study employs a combined quantitative and qualitative research approach. AntConc 3.5.7 is utilized to extract high-frequency words/ word chunks using AntConc 3.5.7, analyzes co-occurrence patterns of thematic terms with WordSmith Tools 6.0, and conducts semantic analysis alongside contextual adaptability discussions. Supported by a self-built bilingual English-Chinese corpus in the textile materials domain, this corpus encompasses three core text types from the critical technological innovation period spanning 2010-2025: academic literature (e.g., excerpts from Textile Research Journal); industry standards like ISO Terminology for Testing Textile Materials and English translations of Chinese textile industry standards; trade documents such as textile import/export contracts and product specifications). [3]This aims to clarify the frequency distribution, collocation patterns, semantic evolution, and word-formation characteristics of English vocabulary in textile materials, establishing a core lexical system for the field. This research holds both theoretical and practical value. Theoretically, it fills a gap in specialized English (ESP) vocabulary studies within the

ISSN 2616-5783 Vol.8, Issue 9: 59-64, DOI: 10.25236/AJHSS.2025.080909

textile materials supplied and advances the "industry technology-language characteristics" correlation theory. Practically, it provides high-frequency word lists and collocation examples for reaching English in textile materials, while offering standardized references for technical document translation and international trade documentation writing, thereby enhancing the efficiency of international industry communication.

2. Literature Review

2.1 Current State of Research on English Vocabulary in the Textile Industry

Research on English vocabulary in the textile industry has garnered some attention, with scholars exploring the topic from various angles. Guo Huifang (2025) identified three key characteristics of textile industry English vocabulary: "highly specialised, closely tied to production processes, and influenced by material developments." The study also cited examples of technical terms such as "spinning" and "dyeing," but did not focus specifically on the "textile materials" subfield. Li Yuting (2024) examined the linguistic features of English vocabulary in the textile industry, highlighting the need for specialised terminology and the importance of industry-specific languages—spinning," and "dyeing - dyeing." However, research has not focused on the specialised field of "textile materials." Li Yuting (2024), in "Research on Characteristics of English Vocabulary in the Textile Industry and Strategies for Improving Translation Quality," analysed the characteristics of English vocabulary in the textile industry but similarly lacked in-depth research on the specialised field of "textile materials." Yue Mannan (2020) in "On the Lexical Characteristic and Translation of English in the Textile Industry," explored the lexical features and translation methods of English in the textile sector, yet did not conduct a specialised analysis of "textile materials." Yang Jing (2024), in her review of Textile English (4th Edition), mentioned the application and translation of English in the textile industry but did not focus on researching English vocabulary for "textile materials."[9] Overall, existing research primarily emphasizes translation strategies, such as the principle of precise correspondence and the principle of terminology consistency, while insufficient attention is given to the dynamic evolution of vocabulary—such as the generation of terminology for emerging materials—and the exploration of cross-context usage patterns.

2.2 Corpus-Driven Research Paradigms for Professional English Vocabulary

Corpus-driven methodologies have demonstrated significant value in specialised English lexical research. Ge Kunyu (2022), based on an engineering English corpus, identified characteristics such as "noun preference" and "fixed high-frequency phrase structures" (e.g., "noun phrase + of phrase") in engineering English, providing methodological references for analyzing textile material vocabulary. The core value of corpora inspocalized lexical research lies in their ability to circumvent "intuitive judgment" biases through objective data, revealing actual word frequencies and collocation patterns—as articulated by the "extended meaning units" concept in Sinclair's corpus-based phraseology theory.

2.3 Limitations of Existing Research and Innovations of This Study

Existing research on English vocabulary in the textile industry exhibits several shortcomings: insufficient focus on specialized domains, with most studies covering the entire textile sector rather than the specific "textile materials" subfield; limited corpus diversity, predominantly relying on academic texts while neglecting trade documents and standards; and there is a lack of bilingual English-Chinese comparative analysis. This study offers distinct innovations: it focuses on the specialized domain of "textile materials," encompasses diverse text types including academic literature, industry standards, and trade documents, and utilises bilingual English-Chinese corpora to reveal cross-linguistic correspondence patterns of vocabulary.

3. Construction of the English Corpus for Textile Materials

3.1 Corpus Selection Criteria

Text Type Suitability: Academic texts must originate from SCI/CSCD-indexed journals to ensure terminology authority; industry standards must be internationally recognised (e.g., ISO, ASTM) or

ISSN 2616-5783 Vol.8, Issue 9: 59-64, DOI: 10.25236/AJHSS.2025.080909

national textile standards to guarantee terminology standardization; trade texts must be authentic import/export contracts reflecting real-world communication scenarios.[4]

Language Purity Control: English texts should prioritize native English speakers or professionally proofread materials; Chinese texts should be official standard translations to minimize translation errors.

Time Span Selection: The period from 2010 to 2025 covers key technological phases such as the "rise of functional fibers" and the "development of green textile materials," facilitating observation of lexical evolution.

3.2 Corpus Processing Workflow

Manual Purification and Classification: Manually remove non-text content (such as charts and formulas) from academic literature, industry standards, and trade texts, while retaining core discussions dense with textile material terminology. Save all processed content uniformly as plain text files (.txt), and store them by "textile material type" (natural/synthetic/functional fibers) and "time period" (2010-2015/2016-2020/2021-2025) to lay the foundation for subsequent tool-based analysis.

Construction and Terminology Screening: Import the standardized texts into WordSmith Tools to build a comprehensive corpus. Generate a word frequency list, filter out non-professional vocabulary, and identify high-frequency core terms such as "fiber" and "textile". Simultaneously, import the texts into AntConc to establish a searchable corpus, which automatically generates contextual concordances for the identified terms, focusing on vocabulary specific to the textile material field.

Extraction and Verification: Use the "N-gram" and "Collocation" functions in AntConc to extract word-formation combinations and collocation patterns. Leverage the "Time Series" and "Key Word" functions in WordSmith Tools to analyze semantic evolution and pragmatic differences. Manually review and eliminate non-textile meanings of polysemous terms, then export word frequency tables and collocation data as empirical evidence for further research.

4. Analysis of English Vocabulary Characteristics in Textile Materials

4.1 Lexical Frequency and Distribution Characteristics

4.1.1 Overall Distribution of High-Frequency Words

Using the corpus tool AntConc to extract high-frequency lexical items (filtering out function words like "the" and "of"), it was found that nouns accounted for the highest proportion among high-frequency words, reaching approximately 65%. Terms like "fiber," "polyester," and "performance" appear frequently, aligning with Ge Kunyu's (2022) conclusion regarding the "preference for nouns in engineering English." Engineering English often describes objects and concepts, where nouns precisely and directly refer to core elements like textile materials, processes, and performance characteristics, hence their dominant role in textile materials English.

High-frequency verbs predominantly appear in passive voice or as neutral terms devoid of emotional connotations, such as "used," "tested," and "analysed." The use of passive voice reflects scientific texts' pursuit of objectivity and neutrality, emphasizing the recipient of the action (e.g., various textile materials or products) rather than the agent performing it, thereby ensuring impartiality and accuracy in descriptions.[5] Adjectives primarily focus on material characteristics, such as "moisture-wicking" and "antibacterial." These terms precisely depict functional and performance attributes, further highlighting scientific texts' emphasis on objectively presenting material properties.[6]

4.1.2 Distribution Differences Across Specialized Fields

Statistical analysis of vocabulary in the corpus categorized into "natural fibers," "synthetic fibers," and "functional fibers" reveals distinct differences in high-frequency terms across domains. In the natural fiber domain, terms like "cotton," "wood," and "silk" are frequently used. Natural fibers boast a long history of use, with relatively mature technologies and applications. These terms effectively represent traditional natural fiber materials and their associated research and applications.

In the synthetic fiber domain, terms like "nylon," "polyester," and "polypropylene" stand out. Synthetic fibers represent a major achievement in modern textile material development. Their excellent properties enable widespread application across numerous fields, explaining their high frequency in

ISSN 2616-5783 Vol.8, Issue 9: 59-64, DOI: 10.25236/AJHSS.2025.080909

this domain and reflecting synthetic fibers' crucial role in the contemporary textile industry.

In the functional fiber sector, emerging terms like "smart fiber" and "biodegradable fiber" have proliferated. With continuous technological advancement, functional fibers represent a new trend in textile material development. These fibers possess specialized functions that meet specific demand across diverse scenarios, and the emergence of such new terminology directly reflects this technological evolution.

The primary reasons for this divergence lie in differences in material sources, preparation processes, and application scenarios. Natural fibers predominantly originate from plants and animals in the natural world, with relatively traditional preparation methods. Synthetic fibers are produced through chemical synthesis, involving more complex and unique processes. Functional fibers, built upon traditional fibers, incorporate advanced technologies to impart special functions and exhibit more diverse application scenarios. These factors collectively lead to the differentiation in vocabulary selection across different fields.

4.2 Lexical Collocation Patterns

4.2.1 Noun Collocation Patterns

Core nouns exhibit typical collocation patterns. "Fiber" frequently pairs with terms like "structure," "property," and "processing," as seen in "fiber structure analysis." The structure, properties, and processing techniques of fibers form the core of textile material research, and such collocations clearly convey relevant research themes and directions.

"Textile" frequently combines with "material," "product," and "industry," as seen in "textile material development." As a core term in the textile sector, "textile" paired with materials, products, and industry encompasses all levels of the textile field—from material R&D to product manufacturing and industry development.

Concurrently, interdisciplinary pairings emerge. Due to the convergence of textile materials science with disciplines like materials science and chemistry, cross-domain combinations such as "fiber morphology" and "polymer synthesis" have developed. These interdisciplinary pairings highlight the cross-disciplinary nature of textile materials science, reflecting the modern need for textile materials research to draw upon multidisciplinary knowledge.

4.2.2 Contextual Adaptation of Polysemous Phrases

Taking "weight" as an example, in the context of "fabric density and weight", it collocates with "fabric" to form "fabric weight", which requires clear differentiation of professional references under different measurement standards: Knitted fabrics commonly use "g/m^2" (grams per square meter) to indicate weight per square meter of fabric, such as $80g/m^2$ single jersey and $280g/m^2$ polar fleece; Denim fabrics, however, use "oz/yd^2" (ounces per square yard) as the unit, e.g., 12-ounce heavyweight denim; For silk fabrics, there is the unique "momme weight" (a unit specific to silk), where 1 momme is approximately equal to 4.3056 g/m^2, serving as a core indicator for measuring silk quality. The differences in measurement logic across various fabric types allow the context to accurately define the industry-specific connotation of "weight", directly demonstrating the restrictive effect of context on word meaning.

Another example is "setting". In the context of "dyeing and finishing process control", it collocates with "heat" to form "heat setting", which specifically refers to a key process for synthetic fiber fabrics (such as polyester and nylon) — applying high temperatures (usually 180-220℃) for a certain period to stabilize dimensions and improve hand feel. The temperature deviation must be strictly controlled within ±5℃ to prevent fabric damage. In the context of "raw material quality grading", it collocates with "fiber" to form "fiber setting", which means classifying cotton fiber grades based on indicators like length and impurity content in accordance with standards such as GB 1103. For instance, Grade 3 cotton requires a length of ⩾28 mm and an impurity content of ⩽2.5%. The same word carries completely different meanings in process operation and quality inspection scenarios, profoundly reflecting the industry-specific nature of word meanings in the textile field. This necessitates that users accurately grasp the essence of terms in combination with specific contexts.

ISSN 2616-5783 Vol.8, Issue 9: 59-64, DOI: 10.25236/AJHSS.2025.080909

4.3 Characteristics of Lexical Semantic Evolution

4.3.1 Emergence of New Vocabulary

Technological innovation is the primary driver behind emerging vocabulary. With the development of functional fibers, terms like "moisture-wicking fiber" and "antibacterial fiber" have emerged. These represent novel fiber materials with specialized functions, meeting diverse functional demands for textile materials across various environments.

The rise of green materials has also spawned terms like "recycled polyester" and "bio-based fiber." As environmental awareness deepens, the textile industry is shifting toward green and sustainable practices, leading to the proliferation of vocabulary related to these new eco-friendly textile materials.

From a word-formation perspective, emerging terms predominantly follow the "property + base material" pattern, such as "flame-retardant fiber." By combining material properties with the base material, these terms concisely express the characteristics of new fibers. Some terms also adopt acronyms, such as "PET" (polyethylene terephthalate), facilitating quick and efficient communication within the industry.

4.3.2 Semantic Expansion of Traditional Vocabulary

The term "carding," originally referring to "wool combing," has expanded with textile technology advancements to denote "a pre-treatment process for ordering fiber bundles." It now applies beyond wool to include cotton, chemical fibers, and other materials. This semantic evolution stems from the broadening application scope of carding techniques as textile processes advance.

"Weave," originally meaning "machine weaving," has now branched into specialized terms like "3D weave" and "wrap-knitted weave" through integration with new weaving technologies. The emergence of these novel techniques has diversified weaving methods and types. To accurately describe these innovations, the semantic scope of "weave" has been refined and expanded.

4.3.3 Word Formation Characteristics

Compound words constitute the largest proportion of English textile material vocabulary, accounting for approximately 40%. Terms like "textile material" and "fiber optic sensor" combine two or more words to form new terms with specific meanings. This word-formation method efficiently expresses diverse concepts and objects within the textile field.

Derivatives are primarily formed using prefixes and suffixes. Prefixes include "anti-" (anti-) and "bio-" (bio-), while suffixes encompass "able" (capable of...) and "vion" (indicating process). For instance, "antistatic" uses the prefix "anti-" to convey the opposite meaning of "static" (static electricity); "biodegradation" employs the suffix "vion" to convert the verb "biodegrade" into a noun describing the process of biodegradation.

Additionally, loanwords are prevalent. Influenced by international trade, textile materials terminology borrows universal trade terms like "FOB" and "CIF," assigning them specific meanings within the textile context. For instance, "FOB Shanghai" denotes the price of goods delivered at Shanghai Port, specifically for textile raw materials, establishing a specialized meaning within textile trade discourse that facilitates international commerce in the industry.

5. Recommendations for Teaching and Applying Textile Materials Vocabulary

5.1 Teaching Optimization Recommendations

Teaching textile materials English vocabulary must anchor to core priorities. High-frequency core terms like "fiber" and "polyester" form the foundation for students' comprehension of specialised content and should be prioritised for teaching their collocation usage. Simultaneously, polysemous words require contextual adaptation explanations within technical scenarios.Introducing these terms through technical scenarios enables students to grasp the contextual meanings of polysemous words more precisely.Teaching methods require innovation, with corpus tools like AntConc proving highly effective. When students independently look up terms like "fiber," they can visually observe collocations such as "fiber structure" and "fiber property." This exposure to objective corpus data helps them grasp real-world usage patterns, enhancing learning autonomy and memory retention. Textbook development requires refinement, incorporating emerging material terminology like "smart fiber" and

ISSN 2616-5783 Vol.8, Issue 9: 59-64, DOI: 10.25236/AJHSS.2025.080909

"biodegradable fiber" to keep students abreast of industry advancements. Simultaneously, integrating vocabulary examples from diverse texts--academic, trade, and others--enables students to understand lexical application across contexts, thereby enhancing comprehensive language proficiency.

5.2 Industry Practice Recommendations

Technical documentation must adhere to the "principle of terminology consistency" (Guo Huifang, 2025). For instance, "color fastness" should be uniformly translated as "sè láo dù" (color fastness), avoiding non-standard translations like "rǎn sè láo dù" (dyeing fastness). This ensures uniform industry understanding and minimises communication misunderstandings both internally and externally. International trade communication requires attention to cross-cultural adaptation of vocabulary. For instance, the British Yorkshire textile finishing term "burr" should be supplemented with explanatory notes when used in global trade to eliminate ambiguities caused by cultural differences and ensure smooth communication.[8] Companies should build English terminology databases for textile materials based on high-frequency word lists and collocation patterns derived from research, enabling standardized technical vocabulary management. Employees can then quickly look up standard usage, collocations, and definitions during R&D, documentation, and trade communications. This boosts efficiency, ensures consistent and professional technical expression, and lays a solid linguistic foundation for international collaboration.

6. Conclusion

This study analyses lexical characteristics based on a self-built bilingual English-Chinese textile materials corpus, concluding that English textile vocabulary exhibits "noun dominance, standardized technical terminology, and dynamic semantic evolution." Its frequency, collocations, and word formation are deeply intertwined with technological advancements and international trade demands. Context determines the meaning of polysemous words, while interdisciplinary vocabulary reflects cross-disciplinary attributes. The self-built corpus also provides data support for research. Limitations include the corpus's limited size, which excludes texts from additional countries/regions, and the absence of pragmatic function analysis. Future work may integrate machine learning for automated lexical identification and annotation, conduct comparative bilingual vocabulary studies, and update findings by tracking industry advancements.

References

[1] Guo, H. Analysis of English Vocabulary Characteristics and Translation Strategies in the Textile Industry[J]. Chemical Fiber and Textile Technology, 2025, 54(05).
[2] Ge, K. Y. A Corpus-Based Study of Phraseology in Engineering English[D]. Harbin: Heilongjiang University, 2022.
[3] Sinclair, J. Corpus Concordance Collocation[M]. Oxford: Oxford University Press, 1991.
[4] Biber, D. Corpus-based Approaches to Issues in Applied Linguistics[J]. Applied Linguistics, 1994, 15(2).
[5] Kou, N., Wang, C. Translation Techniques Based on the Characteristics of Materials English[J]. Engineering Science II; Philosophy and Humanities, 2010(05).
[6] Zhu, S. W., Ren, P. H. Construction of Materials English Corpora: The Development of the "Ferrous Metals" Corpus[J]. Social Sciences II; Engineering Science I; Philosophy and Humanities, 2015(Teaching Reform Project Outcomes): TG141; H319.
[7] Li, Y. T. Research on the Characteristics of English Vocabulary in the Textile Industry and Strategies for Improving Translation Quality[J]. Chemical Fibers and Textile Technology, 2024, 53(8).
[8] Yue, M. N. On the Lexical Characteristics and Translation of English in the Textile Industry[J]. Chinese Science and Technology Translation, 2020, 33(2).
[9] Yang, J. Application and Translation of English in the Textile Industry under Internationalization: Review of Textile English (Fourth Edition)[J]. Wool Textile Science and Technology, 2024, 52(6).