



O'zbekiston Respublikasi
Maktabgacha va maktab
ta'limi vazirligi

ISSN: 2992-9008
UDK: 37

TA'LIM VA TARAQQIYOT

Ilmiy-uslubiy jurnali



2026-YIL 5-SON

www.journal.namspi.uz

Bosh muharrir: Namangan davlat pedagogika instituti rektori B.E.Xusanov
Mas'ul muharrir: Ilmiy ishlar va innovatsiyalar bo'yicha prorektor M.R.Qodirxonov
Mas'ul muharrir o'rinbosari: Ilmiy tadqiqotlar, innovatsiyalar va ilmiy-pedagogik kadrlar tayyorlash bo'limi boshlig'i J.A.Yuldashev

TAHRIR HAY'ATI

Aniq va tabiiy fanlar: k.f.d., prof. Sh.Abdullayev, f-m.f.d., dots. R.Xakimov, k.f.d., prof. N.Vohidova, k.f.d., dots. M.Qodirxonov, b.f.d., dots. A.Batashov, f-m.f.n., dots., T.Abdullayev, p.f.n., dots. M.Eshnazarova, p.f.n., dots. G'.Nafasov, p.f.n., dots. M.Boltayeva.

Texnika fanlari: t.f.d., prof. A.Umarov, t.f.d., prof. A.Qayumov, PhD, dots. Sh.Xudoyqulov, PhD, dots. Abdunazarov.

Ijtimoiy-gumanitar fanlar: s.f.d., prof. T.Fayzullayev, tar.f.d., prof. A.Rasulov. f.f.d., prof. M.Ismoilov, i.f.d., dots. N.Sotivoldiyev, t.f.n., dots. A.Isoqboyev, f.f.n., dots. O.Mamatov, t.f.n., dots. Z.Haydarov, PhD. J.Yuldashev, PhD. A.Abdullayev.

Pedagogika fanlari: p.f.d., prof. B.Xodjayev, p.f.d., prof. X.Najmiddinova, p.f.d., prof. T.Ismoilov, p.f.d., prof. S.Abdullayev. p.f.d., prof., M.Y.Sobirova, p.f.d., prof., R.Zamilova, p.f.d., prof. Sh.Xujamberdiyeva, p.f.d., dost. M.Asqarova, PhD, dots. M.Asranboyeva.

Filologiya fanlari: fil.f.d., prof. N.Uluqov, fil.f.d., prof. H.Usmanova, f.f.d., dots. X.Shokirova, p.f.n., dots. S.Misirov, p.f.n., dots. Sh.Ubaydullayev, PhD., dots. P.Lutfullayev, PhD., dots. M.Yakubbayev.

Texnik muharrir: R.Tursunov

Tahririyat manzili: Namangan shahri, Uychi ko'chasi, 316-uy.

Pochta indeksi: 160136, **Faks:** (0369) 227-27-21,

Email: Info@namspi.uz

"Ta'lim va taraqqiyot" ilmiy-uslubiy jurnali elektron to'plam sifatida O'zbekiston Respublikasi Prezidenti Administratsiyasi huzuridagi **Axborot va ommaviy kommunikatsiyalar agentligi (AOKA)ning 2022-yil 25-oktabrdagi № 045044 raqamli guvohnomasi** asosida chop etiladi. Jurnal **Oliy Attestatsiya komissiyasining 2024-yil 30-noyabrdagi (№ 364/5) yig'ilishi qaroriga asosan pedagogika fanlari bo'yicha falsafa fanlari doktori (PhD) va fan doktori (DSc) ilmiy darajasiga talabgorlarning dissertatsiya ishlari yuzasidan asosiy ilmiy natijalarini chop etish uchun tavsiya etilgan.** UDK: 37, Xalqaro standartlashtirish raqami (ISSN): 2992-9008.

Maqolalarning ilmiy saviyasi va keltirilgan ma'lumotlar uchun mualliflar javobgar hisoblanadi.

THE STRUCTURE, COMPONENTS, AND FUNCTIONS OF ENGLISH SCIENTIFIC-TECHNICAL READING COMPREHENSION COMPETENCE OF FOOD TECHNOLOGY STUDENTS

Abdullayeva Shahnoza Akbaraliyevna

Namangan State Technical University

Namangan, Uzbekistan

e-mail: abdullayevashahnoza85@gmail.com, tel: +998972312112

Abstract. *This article examines the structural composition and functional roles of English scientific-technical reading comprehension competence among students majoring in Food Technology. Drawing on theoretical analysis of English for Specific Purposes (ESP) frameworks, cognitive reading models, and empirical findings from needs analyses in food technology contexts, the study identifies a multi-layered competence structure comprising four interdependent components: linguistic, cognitive-strategic, professional-content, and socio-cultural. Each component serves distinct yet interconnected functions—informational, communicative, developmental, and motivational—within the broader framework of professional training. The findings indicate that reading comprehension competence in this domain is not merely a language skill but a discipline-specific professional competency that mediates access to global scientific knowledge and enables participation in international technical communication. Pedagogical implications emphasize the necessity of integrated instructional approaches that simultaneously address lexical density, strategic reading behaviors, and content-specific schemata.*

Keywords: *English for Specific Purposes, reading comprehension competence, food technology, scientific-technical texts, competence structure*

СТРУКТУРА, КОМПОНЕНТЫ И ФУНКЦИИ КОМПЕТЕНЦИИ В ОБЛАСТИ ПОНИМАНИЯ АНГЛОЯЗЫЧНЫХ НАУЧНО-ТЕХНИЧЕСКИХ ТЕКСТОВ У СТУДЕНТОВ, ОБУЧАЮЩИХСЯ ПО СПЕЦИАЛЬНОСТИ «ПИЩЕВЫЕ ТЕХНОЛОГИИ»

Аннотация. *В статье рассматриваются структура и функциональные аспекты компетенции понимания англоязычных научно-технических текстов у студентов, специализирующихся в области пищевых технологий. На основе теоретического анализа подходов к преподаванию английского языка для специальных целей (ESP), когнитивных моделей чтения и эмпирических данных, полученных в ходе анализа потребностей специалистов данной сферы, в исследовании выделена многоуровневая структура компетенции, включающая четыре взаимосвязанных компонента: лингвистический, когнитивно-стратегический, профессионально-содержательный и социокультурный. Каждый компонент выполняет специфические, но взаимосвязанные функции — информационную, коммуникативную, развивающую и мотивационную — в рамках профессиональной подготовки. Результаты исследования*

свидетельствуют о том, что данная компетенция представляет собой не просто языковой навык, а профессиональную компетенцию, специфичную для конкретной дисциплины; она обеспечивает доступ к мировому научному знанию и позволяет участвовать в международной научно-технической коммуникации. Практические выводы для сферы образования подчеркивают необходимость применения комплексных педагогических подходов, учитывающих одновременно лексическую насыщенность текстов, стратегии чтения и профессионально-ориентированные когнитивные схемы.

Ключевые слова: английский язык для специальных целей (ESP), компетенция понимания прочитанного, пищевые технологии, научно-технические тексты, структура компетенции.

OZIQ-OVQAT TEXNOLOGIYASI TALABALARINING INGLIZ TILI ILMIY-TEXNIK O'QISH IMKONIYATINING TARKIBI, KOMPONENTLARI VA FUNKSIYALARI

Annotatsiya. Ushbu maqolada Oziq-ovqat texnologiyasi mutaxassisligi talabalari orasida ingliz tili ilmiy-texnik o'qishni tushunish kompetensiyasining tarkibiy tarkibi va funktsional rollari o'rganiladi. Maxsus maqsadlar uchun ingliz tili (ESP) doiralarining nazariy tahlili, kognitiv o'qish modellari va oziq-ovqat texnologiyalari kontekstidagi ehtiyojlarni tahlil qilishdan olingan empirik topilmalarga asoslanib, tadqiqot to'rtta o'zaro bog'liq komponentdan iborat ko'p qatlamli kompetensiya tuzilishini aniqlaydi: lingvistik, kognitiv-strategik, professional-kontent va ijtimoiy-madaniy. Har bir komponent professional tayyorgarlikning kengroq doirasida alohida, ammo o'zaro bog'liq funktsiyalarni - axborot, kommunikativ, rivojlanish va motivatsion - bajaradi. Topilmalar shuni ko'rsatadiki, ushbu sohada o'qishni tushunish kompetensiyasi nafaqat til ko'nikmasi, balki global ilmiy bilimlarga kirishni vositachilik qiladigan va xalqaro texnik muloqotda ishtirok etish imkonini beruvchi fanga xos professional kompetensiyadir. Pedagogik oqibatlar leksik zichlik, strategik o'qish xatti-harakatlari va kontentga xos sxemalarni bir vaqtning o'zida hal qiladigan integratsiyalashgan o'qitish yondashuvlarining zarurligini ta'kidlaydi.

Kalit so'zlar: Maxsus maqsadlar uchun ingliz tili, o'qishni tushunish kompetensiyasi, oziq-ovqat texnologiyasi, ilmiy-texnik matnlar, kompetensiya tuzilishi

INTRODUCTION

In an era characterized by rapid globalization of scientific knowledge and technological innovation, the ability to comprehend scientific-technical texts in English has become an indispensable component of professional training across technical disciplines. For students majoring in Food Technology, this competence transcends the boundaries of general language proficiency to function as a critical professional tool that mediates access to international research, technical standards, safety protocols, and

industrial innovations. The global food industry operates through extensive international networks where English serves as the primary lingua franca for scientific communication, regulatory documentation, and technological exchange. Consequently, the capacity to independently read and accurately interpret English-language scientific and technical materials constitutes a foundational element of professional competence for food technology specialists.

English for Specific Purposes (ESP) has emerged as the predominant pedagogical framework for addressing the discipline-specific language needs of such students. Unlike general English instruction, ESP is fundamentally defined by its responsiveness to learners' specific communicative requirements, its alignment with the underlying methodology and activities of the target discipline, and its focus on the language, skills, discourse, and genres appropriate to those activities. Within this framework, reading comprehension occupies a position of particular prominence, especially in contexts where access to specialized knowledge is primarily mediated through written texts. Research in food technology education contexts has consistently identified reading as the most critical skill for academic and professional success, with students reporting vocabulary and reading comprehension as their primary challenges in English-medium technical materials.

This article aims to provide a systematic examination of the structure, components, and functions of English scientific-technical reading comprehension competence among Food Technology students. The central research questions guiding this inquiry are: (1) What are the constituent components of this competence within the specific context of food technology education? (2) How do these components interrelate and function within the broader framework of professional training? (3) What pedagogical implications emerge from understanding the structural nature of this competence? By synthesizing theoretical perspectives on ESP reading competence with empirical findings from food technology contexts, this article seeks to contribute to both the theoretical understanding

of discipline-specific reading competence and the practical development of effective instructional approaches.

METHODS

This study employs a theoretical-analytical methodology, drawing upon systematic review and synthesis of scholarly literature at the intersection of ESP reading comprehension theory, cognitive models of reading, and discipline-specific research in food technology education. The analytical framework is constructed through the following procedures.

First, theoretical foundations were established through examination of prominent models of reading comprehension competence in second language and ESP contexts. Key sources include Khalifa and Weir's cognitive processing model, which delineates reading from word recognition through to creating an intertextual representation, and studies examining component skills critical for ESP reading development, including word-recognition efficiency, vocabulary building, main-idea comprehension, discourse-structure awareness, reading strategies, and reading fluency. These theoretical frameworks provided the analytical categories for identifying competence components.

Second, empirical evidence specific to food technology contexts was identified and synthesized. This included needs analysis studies documenting the actual reading demands and difficulties experienced by food technology students, investigations of specific comprehension challenges in English for Food Technology courses, and studies examining the characteristics of authentic texts in food technology and engineering. The synthesis of these empirical findings was essential for grounding the theoretical framework in the realities of food technology education.

Third, the analytical procedure involved identifying recurring themes and patterns across theoretical and empirical sources to construct a coherent model of competence structure. Components were derived through iterative comparison, seeking convergence between theoretically posited constituent elements and empirically

documented areas of student difficulty and professional need. Functions were identified through analysis of how reading competence is deployed in academic and professional contexts as described in the literature.

RESULTS

The analysis revealed that English scientific-technical reading comprehension competence among Food Technology students comprises four interconnected components, each characterized by specific knowledge domains, skills, and functional roles within the broader competence structure.

Linguistic Component

The linguistic component encompasses the lexical, grammatical, and syntactic knowledge systems that underpin comprehension of scientific-technical texts. Within the food technology domain, this component exhibits distinctive characteristics that differentiate it from general English proficiency. At the lexical level, three categories of vocabulary are distinguished: high-frequency general words, academic vocabulary common across disciplines, and technical vocabulary specific to food science and technology. Technical terms constitute the most domain-specific element, including specialized terminology related to preservation processes (pasteurization, fermentation, lyophilization), food chemistry (lipid oxidation, Maillard reaction), microbiology (pathogenic microorganisms, colony-forming units), and quality control (organoleptic properties, shelf-life stability). Research has consistently identified unfamiliar technical vocabulary as a primary obstacle to comprehension, with 72.7% of food technology students reporting frequent difficulty with unfamiliar words, and 81.8% citing insufficient background knowledge as a persistent challenge.

Beyond individual lexical items, the linguistic component includes formulaic sequences and collocations that characterize scientific discourse in food technology. Terms such as "conduct a hazard analysis," "maintain cold chain integrity," or "achieve commercial sterility" function as lexical chunks that facilitate fluent comprehension when

recognized as unified semantic units. The grammatical dimension involves understanding passive constructions frequent in technical descriptions ("the sample was subjected to thermal processing"), nominalizations ("the implementation of quality control procedures"), and complex conditional structures that specify processing parameters and safety requirements. Syntactic complexity, particularly the prevalence of dependent clauses and extended noun phrases, has been identified as a universal difficulty among food technology students, with 100% of respondents in one study reporting challenges with complex syntax.

Further analysis of the lexical dimension reveals that the vocabulary demands of food technology texts are not uniform but vary systematically across text types and communicative purposes. Research articles intended for specialist audiences exhibit the highest density of technical terminology, often exceeding 15–20% of total word tokens, whereas textbook materials and instructional guides typically maintain lower technical density while employing more elaborate explanatory structures. This variation suggests that the linguistic component of reading competence must be understood not as a static inventory of known words but as a flexible capacity to navigate shifting lexical demands across genres. Moreover, the semantic relationships among technical terms in food technology form intricate networks of hyponymy, meronymy, and causal connection—for instance, the relationship between "thermal processing," "sterilization," "pasteurization," and "microbial inactivation"—such that comprehension depends not merely on recognizing individual terms but on understanding their systemic interrelations within the disciplinary knowledge structure.

The morphological dimension of the linguistic component also warrants attention. Food technology terminology frequently employs Greek and Latin roots, prefixes, and suffixes that, once mastered, provide generative capacity for deciphering unfamiliar terms. Prefixes such as "thermo-" (heat), "hydro-" (water), "lipo-" (fat), and "micro-" (small), combined with suffixes such as "-ation" (process), "-ity" (quality), and "-genic"

(producing), allow readers to decompose and infer the meanings of novel technical terms. Studies indicate that students who receive explicit instruction in morphological analysis demonstrate significantly improved ability to infer meanings of unfamiliar technical vocabulary in food science texts, suggesting that this aspect of the linguistic component is particularly amenable to pedagogical intervention.

Cognitive-Strategic Component

The cognitive-strategic component comprises the mental processes and deliberate strategies that readers employ to construct meaning from scientific-technical texts. This component operates at two levels: cognitive strategies directly engaged in text processing and metacognitive strategies that regulate and monitor comprehension. Cognitive strategies include skimming for gist, scanning for specific information, identifying organizational patterns, making inferences, and predicting content based on textual and contextual cues. For food technology students, strategic competence involves the ability to navigate specific text types characteristic of the field, including scientific research articles, technical specifications, safety protocols, and regulatory documents.

Metacognitive strategies involve planning reading approaches based on task purposes, monitoring comprehension during reading, and evaluating the success of comprehension efforts. The importance of metacognitive awareness is particularly pronounced in ESP contexts where readers encounter unfamiliar content and specialized terminology. Research indicates that strategy instruction integrated with discipline-specific texts can yield substantial comprehension gains, with one study reporting a 28% improvement in comprehension scores following strategic intervention. Strategy deployment varies according to text familiarity: when reading specialized texts within their field, students tend to rely on domain-specific comprehension strategies, while unfamiliar texts prompt greater dependence on linguistic-level strategies such as dictionary use and word analysis.

Detailed examination of strategic behavior among food technology students reveals patterns that illuminate the specific demands of this discipline. When encountering research articles presenting experimental findings, successful readers demonstrate a consistent sequence of strategic actions: first, they survey the abstract and graphical elements to establish a preliminary framework of the study's focus and findings; second, they read the introduction to identify the research gap and objectives; third, they navigate directly to the results section to examine data presentations before engaging with the discussion. This non-linear, strategically guided approach reflects sophisticated understanding of the IMRAD structure that characterizes scientific writing in food technology and related fields. Students who lack this structural awareness tend to read linearly from beginning to end, a strategy that frequently results in cognitive overload and incomplete comprehension when confronted with dense technical content.

The strategic repertoire also includes inferential processing, which assumes particular importance in food technology reading because technical texts frequently presuppose knowledge that is not explicitly stated. For instance, a text describing the effects of a novel preservation technique may assume reader familiarity with standard microbiological concepts, and a discussion of food packaging innovations may presuppose understanding of polymer chemistry principles. Competent readers deploy bridging inferences to connect new information with existing schemata, elaborative inferences to enrich understanding through association with related concepts, and predictive inferences to anticipate forthcoming content based on textual cues and disciplinary logic. Research suggests that inferential processing is a significant discriminator between more and less proficient readers in ESP contexts, and that inferential abilities can be developed through targeted instructional activities that require students to articulate the reasoning underlying their interpretations.

Professional-Content Component

The professional-content component represents the intersection of linguistic knowledge with disciplinary knowledge in food science and technology. This component reflects the principle that ESP reading competence cannot be separated from the conceptual knowledge structures of the target discipline. Readers who possess well-developed schemata for food science concepts—understanding, for instance, the principles of thermal processing, the mechanisms of microbial inactivation, or the chemistry of food preservation—can comprehend technical texts more efficiently because they can integrate new information into existing knowledge frameworks.

The professional-content component includes knowledge of key concepts, processes, and relationships within food technology, as well as familiarity with the genres and discourse conventions through which this knowledge is communicated. Authentic texts in food technology and engineering can be categorized into three groups: informational texts written for professionals (scientific articles, technical reports, product catalogues), pragmatically focused texts addressed to broader audiences (operating instructions, labels, promotional materials), and educational texts from academic sources (textbooks, lecture materials). Each genre presents distinct comprehension demands and requires familiarity with its particular conventions and purposes.

The depth of disciplinary knowledge required for effective comprehension extends beyond surface familiarity with terminology to encompass what might be termed conceptual fluency—the ability to reason with and about disciplinary concepts. When reading a research article on the effects of high-pressure processing on protein structure, for example, comprehension depends not merely on understanding the individual terms but on possessing a working model of protein chemistry, an understanding of how pressure affects molecular bonds, and familiarity with the analytical methods used to assess structural changes. This conceptual fluency enables readers to evaluate the plausibility of claims, identify methodological limitations, and assess the significance of findings—capacities that distinguish genuine comprehension from mere decoding.

Research in food technology education has documented a significant correlation between students' disciplinary knowledge and their reading comprehension performance. Students with stronger backgrounds in food chemistry, microbiology, and processing principles consistently demonstrate superior comprehension of English-language technical texts in these areas, even when their general English proficiency is comparable to that of peers with weaker disciplinary preparation. This finding underscores the inseparability of content and language in ESP reading and suggests that efforts to improve reading competence must address both dimensions simultaneously.

Socio-Cultural Component

The socio-cultural component encompasses understanding of the communicative norms, conventions, and cultural contexts that shape scientific-technical discourse in English. This includes recognition of how scientific arguments are constructed and evidenced, conventions for citing and integrating sources, and the pragmatic dimensions of technical communication such as hedging claims, expressing degrees of certainty, and addressing different audiences. For food technology students, this component also involves understanding the regulatory and standards frameworks that govern international food production and trade, including the discourse of organizations such as Codex Alimentarius, the World Health Organization, and the International Organization for Standardization.

The socio-cultural component further includes awareness of how cultural contexts influence food technology practices and their textual representations. Scientific-technical texts in food technology are not culturally neutral; they reflect particular assumptions about food safety, consumer expectations, and regulatory environments that may differ across national and regional contexts. Competent readers must be able to recognize and interpret these culturally embedded dimensions of technical communication.

An additional dimension of the socio-cultural component involves understanding the rhetorical purposes and audience expectations that shape different types of scientific-

technical texts. Research articles in food technology, for instance, are characterized by a distinctive argumentative structure that moves from establishing a research territory through identifying a gap to occupying that gap through the reported study. Technical standards documents employ a different rhetorical logic, one grounded in prescriptive authority and regulatory compliance rather than empirical argumentation. Product specifications and safety data sheets prioritize clarity, precision, and legal defensibility over narrative coherence. The competent reader must recognize these varied rhetorical purposes and adjust comprehension strategies accordingly, extracting information that serves the reader's particular needs from texts that are shaped by diverse communicative objectives.

Interrelation of Components

While the four components have been presented separately for analytical clarity, they function in an integrated and mutually reinforcing manner in actual reading activity. Linguistic knowledge provides the foundational code that enables text processing; cognitive-strategic abilities determine how effectively that code is deployed for meaning construction; professional-content knowledge supplies the conceptual frameworks within which new information acquires significance; and socio-cultural awareness situates texts within their broader communicative contexts. A deficiency in any one component can impair overall comprehension, while strength in one area can partially compensate for weakness in another. This interdependence suggests that instructional approaches should address all components, though the specific balance may vary according to students' entering profiles and learning objectives.

The interrelation of components is particularly evident in the reading of research articles, which constitute a central genre in food technology education and professional practice. Comprehending such articles requires linguistic competence to process the specialized vocabulary and complex syntax characteristic of scientific writing; cognitive-strategic competence to navigate the IMRAD structure and identify key information

efficiently; professional-content knowledge to understand the scientific concepts, methods, and findings reported; and socio-cultural competence to interpret the significance of the work within the broader research community and to evaluate the validity and implications of its claims. The integrated deployment of all four components enables the reader to move beyond surface comprehension to achieve a deep understanding that supports critical evaluation and application of research findings.

Functions of Reading Comprehension Competence

The four components described above function collectively to serve several critical purposes within the professional training and practice of food technology specialists.

The **informational function** constitutes the most immediately visible role of reading competence. Food technology professionals require continuous access to current scientific knowledge, technological developments, and regulatory updates, the vast majority of which are disseminated primarily or exclusively in English. Reading competence enables the extraction, processing, and integration of this information into professional practice. The informational function operates across multiple text types, from research articles reporting cutting-edge findings to technical manuals specifying equipment operation and safety protocols.

The **communicative function** extends beyond passive reception to encompass the role of reading in enabling broader professional communication. Comprehending scientific-technical texts provides the foundation for participating in academic and professional discourse communities—engaging in discussions, preparing written responses, presenting research findings, and contributing to collaborative projects. The reading process itself involves an internal dialogue with the text, in which the reader evaluates claims, identifies gaps, and formulates responses, thereby developing the communicative resources needed for active professional participation.

The **developmental function** encompasses the role of reading in fostering broader cognitive and professional growth. Reading scientific-technical texts in English develops

critical thinking abilities, analytical skills, and the capacity for independent learning that are essential for lifelong professional development in a rapidly evolving field. Through engagement with challenging texts, students develop tolerance for ambiguity, persistence in problem-solving, and the metacognitive awareness necessary for self-regulated learning. The developmental function also includes the cultivation of reading fluency and automaticity, which reduces cognitive load and allows attention to be directed toward higher-level comprehension and evaluation.

The **motivational function** operates through the reciprocal relationship between reading success and professional identity formation. When students experience successful comprehension of authentic scientific-technical texts, they develop confidence in their professional capabilities and a stronger sense of belonging to the international community of food technology professionals. Conversely, persistent comprehension difficulties can undermine motivation and professional self-efficacy. The motivational function highlights the importance of providing students with appropriately scaffolded reading experiences that build competence and confidence progressively.

DISCUSSION

The multi-component structure of English scientific-technical reading comprehension competence identified in this analysis carries significant implications for both theory and practice in ESP instruction for food technology students. The findings align with and extend previous theoretical work on ESP reading competence, while also revealing discipline-specific characteristics that warrant particular pedagogical attention.

The prominence of the linguistic component, particularly vocabulary, in students' reported difficulties is consistent with broader research in ESP contexts. However, the specific lexical challenges in food technology reflect the distinctive lexical profile of the discipline, which combines highly technical terminology with sub-technical academic vocabulary and formulaic sequences characteristic of scientific discourse. The finding that syntactic complexity presents universal difficulty for food technology students

suggests that instructional attention to grammatical structures cannot be limited to traditional sentence-level analysis but must address the complex nominal and clausal structures prevalent in scientific-technical writing.

The cognitive-strategic component's importance is underscored by evidence that strategy instruction can produce measurable comprehension gains. However, the effectiveness of strategy training depends on its integration with authentic disciplinary texts and its responsiveness to the specific comprehension demands of different text types in food technology. Generic strategy instruction, divorced from the actual texts students will encounter professionally, is likely to yield limited transfer. The finding that students employ different strategies for familiar versus unfamiliar texts suggests the need for instruction that develops a repertoire of flexible strategic responses appropriate to varied reading purposes and text characteristics.

The professional-content component highlights a fundamental tension in ESP instruction: the relationship between language teaching and content teaching. While ESP instructors are typically language specialists rather than food scientists, effective reading instruction requires engagement with disciplinary content. This does not mean that language teachers must become content experts, but rather that they must develop sufficient familiarity with food technology concepts and discourse to design meaningful comprehension tasks and to anticipate areas of conceptual difficulty. Collaborative approaches involving language and content instructors offer one approach to addressing this challenge.

The socio-cultural component, while often overlooked in ESP reading instruction, is essential for preparing students to function effectively in international professional contexts. Understanding the conventions of scientific argumentation, the pragmatics of technical communication, and the regulatory frameworks governing global food production enables students to read texts not merely as repositories of information but as instances of professional discourse with which they must engage as participants.

The functional analysis reveals that reading competence serves purposes that extend well beyond immediate comprehension. The developmental function, in particular, emphasizes the role of reading in fostering independent learning capabilities that are essential in a field characterized by rapid technological change. The motivational function highlights the affective dimension of reading competence development, suggesting that instructional approaches should attend not only to cognitive and linguistic factors but also to students' beliefs, attitudes, and professional aspirations.

Several limitations of this analysis should be acknowledged. First, the study is theoretical in nature, synthesizing existing research rather than presenting new empirical data. While this approach enables broad integration of diverse findings, it cannot substitute for context-specific empirical investigation. Second, the analysis draws primarily on research conducted in Asian and Middle Eastern contexts, where English functions as a foreign language. The structure and components of reading competence may manifest differently in other linguistic and educational contexts. Third, the proposed model requires empirical validation through studies that operationalize and measure the identified components in food technology student populations.

Future research should address these limitations through empirical studies that examine the relationships among components, the developmental trajectories of reading competence over the course of professional training, and the effectiveness of integrated instructional approaches that address multiple components simultaneously. Longitudinal studies tracking students from early undergraduate through professional practice would provide valuable insights into the long-term development and deployment of reading competence in professional contexts.

CONCLUSION

This article has examined the structure, components, and functions of English scientific-technical reading comprehension competence among Food Technology students. The analysis reveals that this competence is a multi-dimensional construct

comprising linguistic, cognitive-strategic, professional-content, and socio-cultural components that function interdependently to enable access to and participation in international scientific-technical discourse. The four functions identified—informational, communicative, developmental, and motivational—highlight the significance of reading competence not merely as an academic skill but as a foundational element of professional training and practice in food technology.

The pedagogical implications of this analysis point toward integrated instructional approaches that simultaneously address the linguistic demands of specialized texts, develop strategic reading behaviors, activate and expand disciplinary schemata, and cultivate understanding of scientific discourse conventions. The specific lexical and syntactic challenges identified in food technology contexts warrant targeted attention within such integrated approaches. Furthermore, the motivational function of reading competence suggests the importance of designing instructional experiences that build students' confidence and professional identity through successful engagement with authentic materials.

For food technology educators and ESP practitioners, the findings underscore the necessity of moving beyond generic reading instruction toward approaches that are responsive to the specific communicative demands of the discipline. The development of reading comprehension competence in English should be recognized as an integral component of professional training, not as a supplementary language skill. By understanding the structural nature of this competence and designing instruction accordingly, educators can better prepare food technology students for the demands of academic study and professional practice in an increasingly globalized field.

References

1. Reading Skills and Reading Comprehension in English for Specific Purposes.
2. Ramadhanty, A. R. (2026). Exploring the English Needs of Food Technology Students at an Indonesian University Context. Undergraduate thesis, Universitas Muhammadiyah Malang.

3. Rusanti, P., Susandi, N. K. A., Dewi, N. K. M. C., & Wismadewi, I. G. A. G. (2023). Students' Difficulties in Reading Comprehension at English for Food Technology. DEIKTIS: Jurnal Pendidikan Bahasa dan Sastra, 3(2).
4. Motivation as a Component of Learning Activities.
5. ESP Materials Development for Light Industry: Needs Analysis and Prototype Syllabus. Zenodo.
6. Kovalchuk, O. Selecting Texts for Developing Receptive Communicative Skills of Students Majoring in Food Technology and Engineering. Kyiv National Linguistic University.
7. Gordyeyeva, A. (2022). Teaching Psychology Students Professionally Oriented Reading. Scientific Notes of Ostroh Academy National University: Philology Series, 13(81).
8. Nation, I. S. P. (2001). Learning Vocabulary in Another Language. Cambridge University Press.
9. Rusanti, P., et al. (2023). Students' Difficulties in Reading Comprehension at English for Food Technology.
10. Behtash, E. Z., Barabadi, A., & Eskandari, Z. (2019). Reading Comprehension Strategies Used by Iranian University Students While Reading Academic English Texts. Issues in Educational Research, 29(4), 1089-1106.
11. Oziq-ovqat Texnologiyasi Talabalari Uchun CLIL va Leksikal Yondashuvga Asoslangan Ingliz Tilidagi Amaliy Vazifalarni Ishlab Chiqish.
12. Muhammadpour, M., & Khalili Sabet, M. (2024). The Impact of an Online Hybrid Reading Intervention on Reading Comprehension and Strategy Use of Iranian ESP Students. Discover Education, 3(1), 1-16.
13. Conceição, S. Compreensão da Leitura em Inglês. Universidade do Algarve.
14. [27] Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.
15. [28] Wallace, C. (2003). Critical Reading in Language Education. Palgrave Macmillan.
16. [29] Widdowson, H. G. (1983). Learning Purpose and Language Use. Oxford University Press.
17. [30] Zhang, L. J. (2019). Reading comprehension in English for Specific Purposes: A review of research and pedagogical implications. Journal of English for Academic Purposes, 41, 100-112.