LEXICAL FEATURES OF UZBEK AND ENGLISH SCIENTIFIC DISCOURSE

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Annotation. The lexical organization of scientific discourse has long attracted the attention of linguists working in both the Uzbek and English academic traditions. Scientific writing, as a specialized communicative practice, draws upon a carefully structured vocabulary that reflects the epistemological values of the scholarly community it serves: precision, objectivity, coherence, and systematicity. Across different linguistic and cultural environments, these values manifest in particular lexical choices that distinguish scientific prose from other registers of language use. The present article examines the lexical features of scientific discourse in English and Uzbek, drawing on the theoretical insights of prominent English-language linguists alongside established scholarship within the Uzbek linguistic traditions. By considering both traditions in dialogue, the article seeks to illuminate both the universal tendencies that characterize scientific vocabulary and the language-specific features that differentiate Uzbek and English scientific writing.

Keywords: scientific discourse, lexical density, terminology, academic vocabulary, nominalization, Uzbek scientific style, English academic writing, corpus linguistics

Annotatsiya. Ilmiy nutqning leksik tashkil etilishi azaldan ham o‘zbek, ham ingliz akademik an’analarida ishlovchi tilshunos olimlarning e’tiborini tortgan. Ilmiy yozish, maxsus kommunikativ amaliyot sifatida, o‘zi xizmat qiladigan ilmiy jamoaning gnoseologik qadriyatlarini aks ettiruvchi puxta tuzilgan lug‘atga asoslanadi: aniqlik, ob'ektivlik, izchillik va tizimlilik. Turli lingvistik va madaniy muhitlarda bu qadriyatlar ilmiy nasrni boshqa tillardan foydalanish registrlaridan ajratib turadigan leksik tanlovlarda namoyon bo‘ladi. Maqolada ingliz va o‘zbek tillarida ilmiy nutqning leksik xususiyatlari ko‘rib chiqiladi, o‘zbek tilshunoslik an’analari doirasida o‘rnatilgan ilmiy izlanishlar bilan bir qatorda taniqli ingliz tilshunoslarining nazariy tushunchalariga asoslanadi. Maqolada har ikkala an’anani dialogda ko‘rib chiqish orqali ham ilmiy lug‘atni tavsiflovchi umuminsoniy tendentsiyalarni, ham o‘zbek va ingliz ilmiy yozuvlarini farqlovchi tilga xos xususiyatlarni yoritishga intiladi.

Kalit so‘zlar: ilmiy nutq, leksik zichlik, terminologiya, akademik lug‘at, nominalizatsiya, o‘zbek ilmiy uslubi, ingliz akademik yozuvi, korpus lingvistikasi.

Аннотация. Лексическая организация научного дискурса давно привлекает внимание лингвистов, работающих как в узбекской, так и в английской академической традициях. Научное письмо, как специализированная коммуникативная практика, опирается на тщательно структурированный словарный запас, отражающий эпистемологические ценности научного сообщества, которому оно служит: точность, объективность, связность и систематичность. В различных языковых и культурных средах эти ценности проявляются в особых лексических приемах, отличающих научную прозу от других регистров использования языка. В данной статье рассматриваются лексические особенности научного дискурса на английском и узбекском языках, опираясь на теоретические идеи видных англоязычных лингвистов, а также на устоявшиеся исследования в рамках узбекской языковой традиции. Рассматривая обе традиции в диалоге, статья стремится осветить как универсальные тенденции, характеризующие научную лексику, так и языковые особенности, отличающие узбекское и английское научное письмо.

Ключевые слова: научный дискурс, лексическая плотность, терминология, академическая лексика, номинализация, узбекский научный стиль, английское академическое письмо, корпусная лингвистика

Introduction

Interest in the lexis of scientific discourse within the English-language tradition grew substantially from the mid-twentieth century onward, stimulated in part by the rapid internationalization of science and the consequent demand for English for Specific Purposes (ESP) instruction. Scholars such as Peter Strevens (1973) drew early attention to the distinctive vocabulary

of scientific English, arguing that science imposes unique demands on language that are reflected most visibly at the lexical level. Subsequent decades saw an explosion of research on academic and scientific vocabulary, culminating in sophisticated corpus-based and genre-analytic frameworks that continue to inform both theoretical linguistics and language pedagogy today. Meanwhile, Uzbek linguists were conducting parallel investigations into the lexical system of Uzbek scientific style, producing rich scholarship that, while less widely cited internationally, offers equally rigorous and productive analytical frameworks. A contrastive approach to these two traditions thus reveals not only the shared structural logic of scientific vocabulary but also the culturally embedded differences in how scientific knowledge is encoded and communicated.

In Uzbek linguistics, the study of scientific text and the distinctive features of scientific style has been undertaken by a limited but significant group of scholars, including M. Mukarramov, M. Hakimov, N. Mahmudov, M. Muhammadieva, M.Mukumov, and N. Ochilova. Among them, M. Mukarramov pioneered systematic research on the scientific style of the modern Uzbek language, focusing on its structural and lexical organization . M. Hakimov examined the syntagmatic and pragmatic characteristics of scientific texts, analyzing how meaning is constructed and communicated within academic discourse. M. Mukumov, in his comparative investigations, explored the linguo-expressive and intertextual features of English and Uzbek scientific texts, thereby contributing to a broader understanding of cross-linguistic academic discourse. These studies have played an important role in shaping the theoretical foundations of scientific style analysis in Uzbek linguistics.

In English-language scholarship, scientific discourse has been extensively studied within systemic functional linguistics, corpus linguistics, genre analysis, and English for Academic Purposes. Halliday (1985) identified lexical density and grammatical metaphor as central mechanisms of scientific language. Biber (1988) demonstrated through corpus analysis that academic prose exhibits high informational density and complex noun phrase constructions. Swales (1990) emphasized the genre-based organization of academic discourse, while Hyland (2005) highlighted the role of stance and interaction in lexical choice. This article integrates these theoretical traditions to provide a comparative analysis of lexical-semantic features in Uzbek and English scientific discourse.

Main body

Scientific discourse constitutes a structured linguistic system shaped by epistemological, disciplinary, and communicative norms. It is designed to express knowledge with maximum clarity and minimum ambiguity. One of its defining features is its lexical organization, which ensures informational density, conceptual abstraction, and terminological precision. The lexical characteristics of scientific texts serve to ensure the fundamental principles of scientific communication such as precision, coherence, and objectivity. The lexical features of scientific discourse in Uzbek and English have their own specific traits, and these characteristics are closely connected with the semantic, stylistic, and pragmatic aspects of scientific texts in both languages.

This primacy of terminological vocabulary is equally prominent in the Uzbek linguistic tradition. Many linguists emphasize that one of the most prominent units in the scientific style is terminology. However, scientific texts contain not only terms but also other lexical units. For example, M. Mukarramov divides the lexical layer of Uzbek scientific style into four groups: common vocabulary; general scientific vocabulary; terminological vocabulary; and symbolic signs . The scholar also includes conventional abbreviations typical of scientific style within the category of symbolic signs. Common vocabulary consists of lexical units used across all functional styles of bookish speech and whose sphere of usage is not restricted. Such words constitute a large portion of the lexical stock. Common vocabulary includes words understandable to everyone regardless of age, gender, profession, specialization, or educational level, and they are mainly used in everyday communication. Examples include independent and auxiliary parts of speech such as *I, you, one, two, thus, if, finally, moon, earth, sun.* The presence of this stratum in scientific texts is not incidental; as Douglas Biber (1988) demonstrated through large-scale corpus analysis, even highly technical scientific registers retain a substantial proportion of general vocabulary, and it is the distribution and co-occurrence patterns of lexical items — rather than the mere presence of technical terms — that ultimately define a text's register. Biber's multi-dimensional analysis of English registers remains a landmark contribution to understanding how vocabulary, grammar, and discourse function interact to produce the characteristic texture of scientific prose

Beyond the question of specialized terms, English-language scholarship has paid considerable attention to what is variously called general academic vocabulary or, in the Uzbek tradition, general scientific vocabulary. K. Hyland (2006), whose work on academic discourse has been enormously

influential, identifies a stratum of vocabulary that recurs across all academic disciplines and serves to organise scholarly argument, position the author in relation to prior research, and signal the rhetorical structure of the text . Words such as theory, analysis, evidence, framework, and methodology belong to this layer; they are not discipline-specific in the way that, say, homeostasis or eigenvalue are, yet they are nevertheless distinctly academic in their function and frequency distribution. Hyland’s attention to this stratum resonates with earlier empirical work by A. Coxhead (2000), whose Academic Word List (AWL) identified 570 word families that appear with high frequency across academic texts from a range of disciplines and are therefore of particular importance for learners of academic English . The AWL demonstrated that beyond specialized terminology, there exists a substantial body of general academic lexis that underpins scholarly communication across fields.

This finding aligns with the Uzbek scholarly tradition, where M. Mukarramov distinguishes a layer of general scientific vocabulary , he counted comprising words such as *theory, method, scientific literature, discovery, scholar, researcher, scientific inquiry, system, structure, law, rule, category, chapter, and section* as a distinct stratum of scientific speech separate from disciplinary terminology . Its distinguishing feature is that it functions equally across all branches of science and expresses exclusively scientific concept.

Undoubtedly, one of the main lexical features of scientific discourse is the use of specialized scientific terminology. The word “term” derives from the Latin terminus, meaning “end,” “boundary,” or “limit.” Linguist A.A. Reformatsky defines a term as a word that is limited by its specific and special features and denotes a single, precise meaning in the fields of science, technology, economics, politics, and diplomacy . Terms not only record scientific knowledge and results and organize them into a particular system, but also facilitate the discovery of new knowledge. Common vocabulary includes lexical items not restricted to scientific discourse but used to organize logical structure and coherence. These common words include conjunctions, pronouns, numerals, and high-frequency lexical items. In both Uzbek and English scientific discourse, such units support textual cohesion and argumentative flow.

Terminology forms the core lexical layer of scientific discourse. Reformatsky (1967) defines a term as a word characterized by precision and limited semantic boundaries within a specific field [10]. Cabré (1999) further argues that terminology performs communicative, cognitive, and linguistic functions. Halliday (1985) explains that scientific discourse increases technicality through specialized lexical choices . Terminology ensures monosemy within disciplinary boundaries and supports systematic classification of knowledge. Uzbek scientific language has developed through terminological dictionaries and institutional efforts to standardize vocabulary in medicine, biology, mathematics, physics, and other disciplines.

The formation and development of scientific style are directly connected with human activity in various fields. The main instrument for creating a developed scientific style in any language is the establishment and systematic enrichment of scientific and technical terminology [8]. In various scientific fields, Uzbek scholars have made significant contributions to the development of Uzbek scientific style through terminological dictionaries and original works. For example, Y.K.To‘raqulov and A.X. Usmonxo‘jayev (medicine); Q. Zokirov and H. Jamolxonov (biology); Qori Niyoziy and M. Sobirov (mathematics); R. Bekjonov and X. Mallin (physics); O. Usmonov (social and political sciences); and X. Usmonov (chemistry). Although much time has passed since the publication of these works and dictionaries, they continue to serve as a foundation for later publications in various fields. A vivid example is the Explanatory Dictionary of Medical Terms published in 1996 by Y.K. To‘raqulov, A.X. Usmonxo‘jayev, and O‘.O. Oripov.. This dictionary was revised and expanded in 2022 into a two-volume edition covering 10,000 words by A. Usmanxodjayev, O‘. Abilov, M. Turaxanova [7]. This sustained lexicographic effort reflects a broader institutional commitment to the development of Uzbek as a full medium of scientific communication, a commitment that parallels the efforts made in many languages to establish and standardise scientific terminology as a prerequisite for participation in international scholarly life.

Lexical density is a hallmark of scientific discourse. Halliday (1985) defines it as the ratio of lexical items to grammatical items . Scientific writing contains high proportions of nouns and nominal groups, often constructed through nominalization. Nominalization transforms processes into abstract entities (e.g., regulate → regulation; analyze → analysis). This contributes to abstraction and depersonalization. Biber et al. (1988) demonstrate that English academic prose exhibits frequent nominal constructions and complex noun phrases. Uzbek scientific discourse also employs

nominalization, typically through agglutinative suffixes such as -lik, -ish, and -uv, enabling conceptual abstraction.

Scientific discourse has traditionally been associated with objectivity and impersonality. However, Hyland (2005) argues that academic writing involves strategic stance-taking through lexical choices such as suggest, appear, indicate, possibly, and likely [5]. Biber (2006) shows that English academic prose uses epistemic markers and hedges to manage claims . Uzbek scientific discourse also employs cautious expressions, though traditionally it favors impersonal constructions. Thus, lexical choice reflects both epistemic caution and rhetorical persuasion.

Research in English scientific discourse shows that academic words occur in patterned phraseology (e.g., the results indicate that; findings suggest that). Such lexical bundles reflect disciplinary conventions. Uzbek scientific discourse similarly contains formulaic expressions (e.g., mazkur tadqiqotda…, natijalar shuni ko‘rsatadiki…), which function as rhetorical structuring devices. Both Uzbek and English scientific discourses demonstrate: 1) layered lexical systems; 2) high terminological density; 3) nominalization; and 4) conceptual abstraction. However, English discourse is highly internationalized and corpus-documented, while Uzbek scientific discourse continues to expand through terminological development and integration into global academic standards.

Conclusion

The foregoing discussion demonstrates that the lexical features of scientific discourse have been examined from multiple theoretical perspectives in both the English-language and Uzbek linguistic traditions, and that the two traditions share a number of fundamental insights while also reflecting distinct intellectual genealogies and methodological emphases. Both traditions recognize the multi-layered nature of scientific vocabulary, distinguishing between common vocabulary, general scientific vocabulary, and specialized terminology as functionally distinct strata that interact to produce the characteristic lexical texture of scientific prose. English-language scholarship has contributed particularly rich frameworks for understanding the corpus-based frequency distributions of academic vocabulary, the rhetorical functions of lexical metadiscourse, and the phraseological patterns that underpin genre conventions in scientific writing. The Uzbek tradition has contributed detailed taxonomic and lexicographic analyses of scientific vocabulary, as well as an extensive body of terminological scholarship that documents the historical development of Uzbek as a language of science.

A contrastive and comparative perspective reveals that while the principles of precision, coherence, and objectivity are universally valued in scientific communication, the lexical means through which these principles are realized differ in ways that reflect the grammatical structures, morphological resources, and rhetorical traditions of the two languages. English scientific discourse, shaped by a long tradition of nominalization and lexical compression as described by Halliday, tends to pack high informational density into noun phrases and nominal constructions, while Uzbek scientific discourse, rooted in an agglutinative morphological system and a distinct rhetorical heritage, may realize similar communicative goals through different lexical and grammatical strategies. These differences have important implications for translation, for second-language academic writing instruction, and for the comparative study of scientific discourse more broadly. Future research employing corpus-based methods would be well placed to quantify and describe these differences more precisely and to contribute new empirical insights to this productive area of contrastive discourse analysis.

References

1. Biber, D. (1988). Variation across speech and writing. Cambridge University Press.
2. Biber, D. (2006). University language: A corpus-based study of spoken and written registers. John Benjamins.
3. Coxhead, A. (2000). A new academic word list. TESOL Quarterly, 34(2), 213–238.
4. Halliday, M. A. K. (1985). An introduction to functional grammar. Edward Arnold.
5. Hyland, K. (2006). English for academic purposes: An advanced resource book. Routledge.
6. Strevens, P. (1973). Technical, technological and scientific English. ELT Journal, 27(3), 223–234.
7. Usmanxodjayev, A., Abilov, O‘., & Turaxanova, M. (2022). Tibbiy atamalar lug‘ati [Dictionary of medical terms]. Donishmand ziyosi.
8. Маҳкамов Н. Ўзбек тили илмий услубининг шаклланиши ва тараққиёти [Formation and Development of the Scientific Style of the Uzbek Language] // Ўзбек тили ва адабиёти. 2019, №5 - 47 б.

9. Мукаррамов М. Ҳозирги ўзбек адабий тилининг илмий стили [Scientific Style of Contemporary Uzbek Language].— Т.: Фан, 1984. – 17 б.

10.Реформатский, А. А. (1967). Введение в языкознание. [Introduction to linguistics]. Просвещение.