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Research article

# A Digital Technology for Learning English Terminology through Glossary Compilation

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## Abstract

The article examines modern digital tools that enhance the effectiveness of professional foreign language acquisition by non-linguistic students. The resources presented here contribute to successful professional terminology acquisition by means of compiling specific scientific lexicons utilizing computer-aided vocabulary-building tools. The authors share the results of their practical work in Russia and present their considerations from the Russian experience regarding advantages and disadvantages of using the applications by modern students. The design encompasses a review of modern applications that can provide support in improving their vocabulary to both professional linguists and students of non-linguistic fields that help to master their language skills alongside with developing one's academic, communicative and intercultural competencies. The applications utilized in the study are TermoStat Web, AGROVOC, WIPO Pearl, and Notion. The article depicts strong and weak points of each tool and their benefits for students. Among the most important findings is the fact that the applications tested by the authors can be used at almost any language proficiency level. Practical implication embodies the possibility of embedding the findings in the current curricula of English for Specific Purposes taught in non-linguistic Universities. The results may have significant academic and social implications making students more thoughtful about the subjects they are not well versed in and more confident and well-prepared for work in multicultural environment. The singularity of the design lies in the fact that the tested computerized instruments are considered as one of the main teaching aids and can be recommended to be widely used in the modern foreign language teaching curricula.

**Keywords:** Terminology; Term; Term extraction; Text corpus; Terminological system; Special text; Foreign language learning

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Научная статья

# Цифровая методика обучения англоязычной терминологии посредством составления глоссариев

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**Аннотация**

В статье рассмотрены современные цифровые инструменты, использование которых повышает эффективность обучения профессиональному иностранному языку студентов нелингвистических направлений подготовки. Исследованные информационные продукты способствуют успешному овладению профессиональной терминологией на иностранном языке путем составления глоссариев с использованием автоматизированных средств формирования словарного запаса. Авторы рассматривают преимущества и недостатки применения подобных приложений современными студентами, основываясь на результатах своей практической деятельности в России. В работе приведен обзор актуальных приложений (платформ), которые могут оказать помощь в расширении словарного запаса как профессиональным лингвистам, так и студентам неязыковых специальностей. Приведенный инструментарий помогает студентам овладеть языковыми навыками наряду с развитием академической, коммуникативной и межкультурной компетенций. Использованы такие приложения, как TermoStat Web, AGROVOC, WIPO Pearl и Notion. В статье описаны сильные и слабые стороны каждого инструмента и их преимущества для студентов. Одним из наиболее важных выводов является тот факт, что протестированные авторами приложения могут быть использованы практически на любом уровне владения языком. Практическая значимость заключается в возможности внедрения полученных результатов в текущие учебные программы по английскому языку для специальных целей в неязыковых вузах. Подобные средства обучения имеют ряд значительных академических и социальных преимуществ, помогая студентам более вдумчиво относиться к сложному предмету, улучшая его понимание и усвоение, а также стать более уверенными и хорошо подготовленными к работе в мультикультурной среде. Особенность разработки заключается в том, что протестированные компьютеризированные инструменты рассматриваются как одно из основных средств обучения и могут быть рекомендованы к широкому использованию в современных учебных программах по иностранным языкам.

**Ключевые слова:** Терминология; Термин; Извлечение терминов; Корпус текстов; Терминологическая система; Узкоспециальный текст; Обучение иностранному языку

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## INTRODUCTION

The Council of Europe, UNESCO, the United Nations (UN) and the International Association of Universities (IAU) have long been committed to the internationalization of education and intercultural cooperation within academic communities. As part of the UN 2030 Agenda for Sustainable Development, one of the main objectives is to integrate global knowledge and best practices into university curricula. This is in line with efforts to prepare students for the global workforce by promoting intercultural competencies and advanced communication skills. Europe values multilingualism and the effective use of languages in professional contexts through the Common European Framework of Reference for Languages (CEFR). Likewise, the IAU actively supports initiatives to improve global academic collaboration, including exchange programs and joint research projects. In its most recent report on the internationalization of higher education (April 2024), the IAU emphasized the growing importance of virtual internationalization, for example through online exchanges and internships. These initiatives offer students the opportunity to connect with international peers and expand their academic horizons without the need for physical mobility. Over the past five years, virtual internationalization has increased significantly, highlighting the need for its inclusion in educational programs (Marinoni & Pina Cardona, 2024).

The emphasis on virtual internationalization underscores the importance of equipping Russian university students with the skills to navigate digital international networks and participate in global educational and research initiatives. This trend not only increases access to international resources, but also promotes global competencies that are critical for professional success in multicultural environments. These developments are in line with the Russian State Educational Standards for Higher Education, which highlight three key universal competencies for master's graduates: communication, intercultural interaction and self-organization with self-development. Communication competency focuses on the use of modern communication technologies, including foreign languages for academic and professional purposes. It enables students to read specialist literature, write texts and present research results at scientific events. Intercultural interaction develops the ability to communicate effectively across cultural boundaries, recognize diversity and promote teamwork in different socio-cultural contexts. The competency of self-organization and self-development emphasizes self-directed growth and equips students with skills for self-assessment, information analysis, and lifelong learning. In the master's program in Agronomy (field of study 35.04.04), these skills are implemented through the “Foreign Language” course which is focused on English for Specific Purposes. Through this course, students will learn how to use digital tools to solve academic and professional communication problems, access and evaluate global scholarly resources, and engage in professional discussions in English. It ensures that graduates are prepared for the demands of the globalized academic and professional environment. This paper presents the observation results recorded by the authors who teach students at Russian State Agrarian University-Moscow Timiryazev Agricultural Academy. The considerations from the Russian experience may be of interest both for Russian and international readership.

## PROBLEM DEFINITION

Working with scientific articles from foreign sources often requires processing information in English. These articles contain technical terms related to their scope of scientific studies, which require appropriate understanding and translation from English into Russian. The topic has been reflected on by scientists for a long time (Lotte, 1982; Malyarchuk-Proshina & Burlachenko, 2020; Volgina, 2013). Artificial intelligence (AI) has added machine-driven inventory of new tools contributing to more effective and precise language learning in all research areas, especially when teaching Agronomy students (Vigna-Taglianti, 2024). On the one hand, this advancement enhances the efficiency of learning process, on the other hand, students often prefer to use built-in translators based on neural network technologies rather than traditional dictionaries and manual glossary creation. This often leads to significant distortions in the understanding of the terms and thereby reduces the quality of their scientific work (Jolley & Maimone, 2022; Kartasheva, 2024; Schmidt & Strasser, 2022).

Neural translators like ChatGPT achieve high efficiency when we add contextual information – such as the target audience, the purpose of the text, stylistic features and the subject area – such systems can take into account specific translation needs. This approach adapts register, style and translation approach depending on the task. Terminological accuracy increases when supplemented by bilingual terminological glossaries (Ryabchikova, 2024; Siu, 2023).

However, without appropriate preparation, automated translators often fail to convey the correct meaning of complex terms and fixed expressions typical of scientific texts. Modern machine translation systems often rely on word-for-word translation algorithms, which leads to misinterpretation of technical terms. For example, polysemic terms, neologisms, interdisciplinary terms or complex multi-component terminological expressions such as *data-driven sustainable agricultural practices* require detailed analysis and knowledge of the context in which they are used (Alipichev et al., 2023; Rothwell et al., 2023).

Sociocultural differences between countries can lead to discrepancies in agricultural terminology (Zaripova et al., 2024). Climate, geographic factors, and historical experiences influence regional agricultural practices and terminology. Country-specific agricultural policies and regulations often require adjustments to adapt to the legal context of the target language. Even universal terms like *soil health* can be interpreted differently depending on the region, reflecting different agricultural priorities and underlying cultural values. Soil health practices adapt to regional needs: *intensive agricultural areas* emphasize erosion control and nutrient optimization (e.g. no-till and cover cropping); *drylands* emphasize salinity management and drought resilience (e.g., mulching and biochar); and in the European Union (EU), sustainability efforts focus on biodiversity, organic matter and reduced use of chemicals, supporting organic farming and soil conservation. Translating *soil health* into Russian requires not only a literal translation, but also an adaptation to the scientific and practical realities of Russian farming methods (Weninger et al., 2024). Agricultural practices vary significantly with region, resulting in technical terms that may not have exact equivalents in other languages.

In addition to the asymmetry, translation difficulties also arise due to their multicomponent nature (Leitchik 2012; Ponomarenko et al., 2018; Riabtseva, 2024). As technology advances in agriculture, there is a growing need for precise terminology that accurately reflects modern processes and concepts. Multicomponent terms are essential for detailed descriptions of complex methods and approaches that integrate knowledge from multiple scientific areas. For example, the traditional term *irrigation* has evolved into *real-time precision irrigation system for optimal crop yields and water conservation*, emphasizing the use of technology to optimize water use and improve crop yields, while *pest control* is morphing into *integrated pest management (IPM) strategies* that include a comprehensive approach to minimize the use of pesticides and to protect the environment. These examples show how multi-component terms reflect the integration of precise, science-based methods and interdisciplinary approaches, bringing together agronomy, genetics, ecology and technological innovations. Thus, the development of agricultural terminology not only marks technical progress, but also highlights the importance of sustainable resource management and the need for precise language to describe increasingly complex systems and approaches in modern agricultural practice.

The most common models of multi-component terms in the agronomic literature allow flexible expression of complex scientific concepts, consolidating their elements (adjectives, nouns, verbs, adverbs, numerals). Some terms use prepositions to link components and create more specific meaning (resistance to pests, management of water resources, impact on soil health, reduced amount of organic matter from a high rate of decomposition), multiple modifiers to describe a noun (rapidly growing and high-yielding varieties, environmentally friendly pest control methods), participles (seed-treated plot, an effective farmer-centred mobile intelligence solution), hyphens to form a single unit with a specific meaning (high-value crops, small-farmers, a viable climate-smart option for boosting food production), numerals (five-year crop rotation).

It is worth noting that structural models of terminological units for Russian and English are a well-studied area of linguistics. Multi-component terminological collocations both present complexity due to their structure, and cause translation problems that are typical of the interpretation of simple terms. Even within a complex word combination, terms with more than one meaning can occur (e.g., crop rotation system, cover crop, crop biomass). If the wrong meaning is chosen, it can distort the meaning of the whole construction (Riabtseva, 2022; Sidorova & Popova, 2023).

Individual words within a compound term may not have an exact equivalent in the target language. For example, in the term *no-till cereal-based systems*, the difficulty lies both in the multi-component nature, and in the fact that the term *no-till* itself can be translated differently in different countries as *no-tillage*, *direct seeding*, which creates asymmetry in understanding and interpretation. For example, research in soil science emphasizes that such discrepancies lead to terminological inconsistencies, which represent a major obstacle to the application of research results in practice. Consequently, ensuring clarity and tailoring explanations to the audience is critical to improving communication and achieving consistent understanding (Mironina & Sibiryakov, 2013; Weninger et al., 2024).

In addition, multi-component terminology often contains neologisms that are not yet established terms and lack standard equivalents in other languages (Cabré & Norris, 2023). They can be either fixed (collocations) or flexible, which makes their translation and interpretation still more complex. Fixed phrases like *precision farming techniques* have a predictable structure and meaning, making them easier to translate. In contrast, flexible expressions such as *data-driven agriculture* or *sensor-guided farming* require greater contextual understanding and adaptability.

For accurate meaning, translators must consider scientific context. Machine translators often have difficulty interpreting such contexts, which creates additional hurdles for students. These tools' results are often imprecise and unsuitable for academic purposes. Errors can lead to distorted scientific data and misinterpretations of research outcomes.

In order to expose inaccuracy of machine translation of the specific language an article title on the UK government website (Figure 1) has been processed by four translation systems (Wooordhunt, Yandex, Reverso, and DeepL) with the focus on terminology. Neither grammar nor stylistic mistakes have been taken into consideration, as they are not the object of this research.

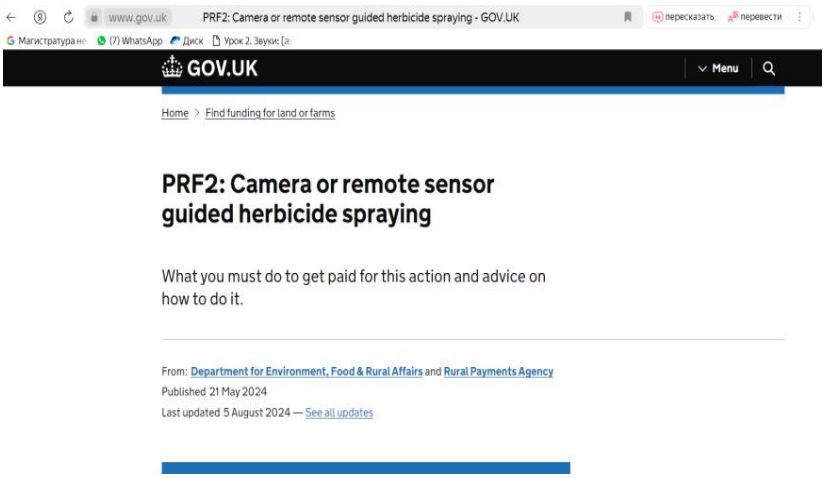


**Figure 1**. The UK government website

None of the systems decoded the *PRF2* abbreviation and left it untranslated without explanation (Figures 2-5) thus neglecting the operation principal of precision agriculture while *PRF2* stands for precision farming equipment to apply herbicides. Not translating the abbreviation makes the whole system a mere spraying tool.

Wooordhunt (Figure 2) is unable to handle abbreviations and specialized multi-word concepts longer than four words and therefore is not suitable for many of modern multi-component scientific terms.

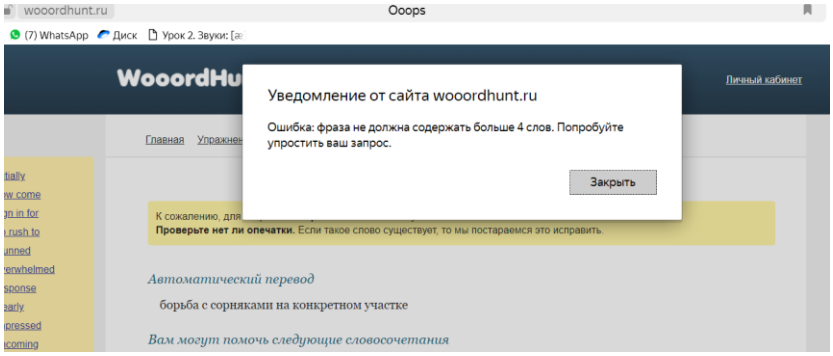


**Figure 2**. Wooordhunt

Yandex (Figure 3), Reverso (Figure 4) and DeepL (Figure 5) have simplified some terms, namely *guided* to *with the help of* (с помощью) omitting the idea of being equipped with and controlled by an automatic guidance system; *remote-sensor* is reduced to an ordinary observation instrument (датчик), which reacts to certain physical conditions such as heat or light, and which is used to provide information, thus altering the meaning of smart farming practice of automatic decision making.

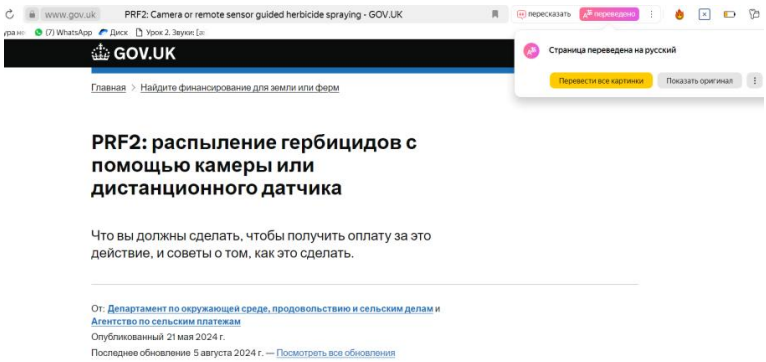


**Figure 3**. Translation by Yandex neural network

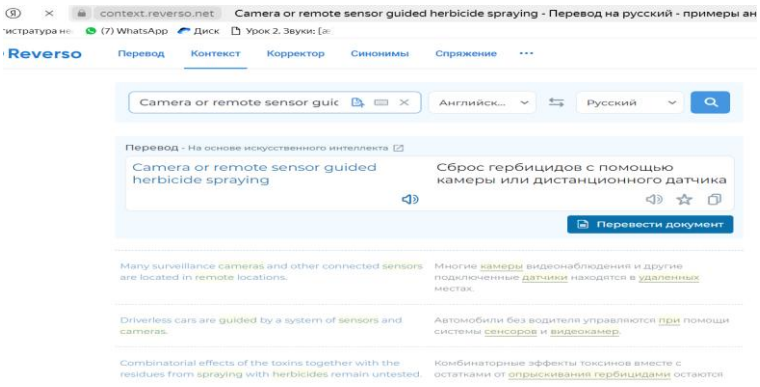


**Figure 4**. Translation by Reverso

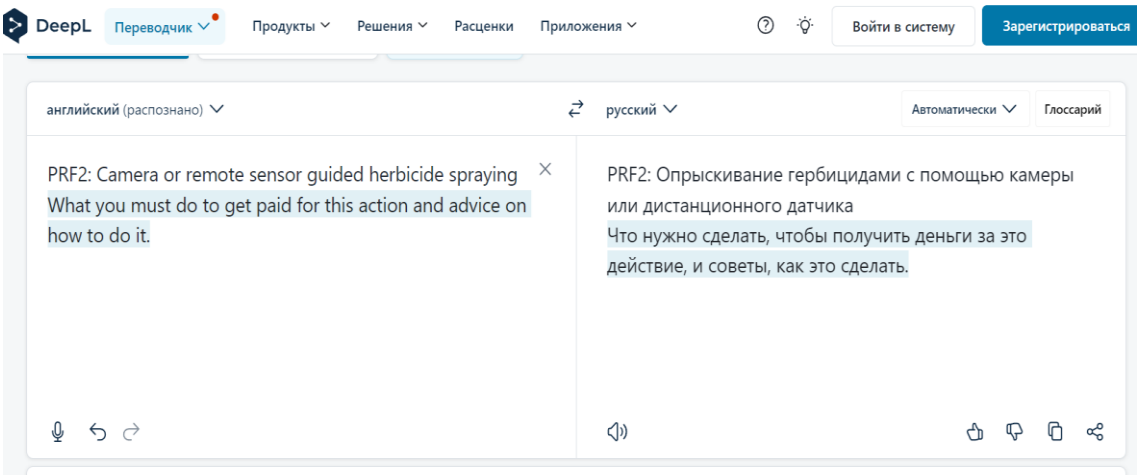


**Figure 5**. Translation by DeepL

The examples given reflect the fundamental gaps in current students' practices of using digital tools.

The observed trend of replacing traditional paper dictionaries with digital lexicographic databases has significantly changed the way students interact with academic literature. Modern digital dictionaries offer significant potential as 'electronic assistants' (e-assistants) by providing users with personalized answers to queries. AI technologies integrated into such dictionaries automate the processing of lexicographic information. However, these systems remain vulnerable to challenges related to the ambiguity of terms and the complexity of scientific language. Students often encounter limited information when using embedded translators because the definitions provided in pop-up windows are too short to provide a comprehensive lexical picture.

A number of representative examples clearly demonstrate the mistakes made by students with the help of embedded translators regardless of the operational system, smartphone model, etc. The students' interactive translation suggestions have been compared to the translations read by one of the reliable thesauri or dictionaries such as AgroVoc, WIPO Pearl, etc. The comparison results demonstrate how the automated translation reflects on the quality of the students' glossaries. They are presented in tables 1-3. All the mistakes have been grouped according to the possible underlying reasons for them. The most common mistakes occur due to the students' inaccurate command of the terminology in Russian when they translate the terminology themselves without using dictionaries or thesauri (table 1).

**Table 1.** Students' translations compared to dictionaries and/or thesauri caused by inaccurate command of the Russian terminology

| No | Original | Student's translation | Thesaurus/Dictionary entry |
|---|---|---|---|
| **1.1.** | soil fertility | почвенное плодородие | продуктивность почвы, плодородие почвы |
| **1.2.** | small grains | мелкие зерна | зерновые культуры (кроме кукурузы), мелкосемянные злаковые культуры (зерно) |
| **1.3.** | alien species | инвазивный вид, чужеродные виды | интродуцированные виды |
| **1.4.** | persistence | устойчивость | персистентность |
| **1.5.** | soil texture | текстура | механический состав почвы |
| **1.6.** | common names | общие названия | общеупотребительные названия |
| **1.7.** | gelatinization | гелатификация | гелеообразование |
| **1.8.** | agricultural practicies | сельскохозяйственные практики | технологии сельсткохозяйственного производства |
| **1.9.** | cover crops | покровные культуры | почвопокровные растения |
| **1.10.** | DNA repair | ремонт ДНК | репарация ДНК |
| **1.11.** | EMS | EMS | этилметансульфат, эмс |

Another notable group contains mistakes due to insufficient command of English. These mistakes occur for a number of reasons: students cannot identify the word combination or the primary word within the word combination, do not know the word combination structure or do not understand the word/sentence structure. It is worth noting that some of these word-combinations are listed neither in dictionaries nor in thesauri, and this is the case when it is very important to understand the structure of the language units and translate them by a human without using machine translation. These examples are given in table 2.

**Table 2.** Students' translations compared to dictionaries and/or thesauri caused by insufficient command of English

| No | Original | Student's translation | Thesaurus/Dictionary entry |
|---|---|---|---|
| **2.1.** | sheep carrying capacity | продуктивность овец | пропускная способность пастбища |
| **2.2.** | pasture species | виды пастбищ | Not listed |
| **2.3.** | medium-rainfall region | средний уровень осадков в регионе | Not listed |
| **2.4.** | malting and brewering industries | солодовня и пивоварня | Not listed |
| **2.5.** | experimental design | экспериментальный план | план эксперимента |
| **2.6.** | pulverized | измельчение | Not listed |
| **2.7.** | controlled environment agriculture | конролируемое экологичное сельское хозяйство | регулирование параметров окружающей среды, контролируемые условия |

Apart from these mentioned mistakes there is still another large group when students pick the first available meaning of the word or word-combination to use it as a glossary entry and then in their translation work. Such examples are very often not listed in the dictionaries or thesauri and may demonstrate both inaccurate command of the Russian terminology and insufficient command of the language and. They are presented in table 3.

**Table 3.** Students' translations compared to dictionaries and/or thesauri caused by either inaccurate command of the Russian terminology or insufficient command of English

| No | Original | Student's translation | Thesaurus/Dictionary entry |
|---|---|---|---|
| **3.1.** | forest management | управление лесами | лесопользование, ведение лесного хозяйства |
| **3.2.** | urban agriculture | домашнее хозяйство | городское сельское хозяйство |
| **3.3.** | vertical dimensions | вертикальное измерение | вертикальные размеры |
| **3.4.** | variety | разнообразие | сорт (таксон) |
| **3.5.** | reset | сбросить | Not listed |
| **3.6.** | escape-in-time strategy | стратегия побега вовремя | Not listed |
| **3.7.** | gap opening penalty | штраф за открытие пробела | Not listed |
| **3.8.** | gap extension penalty | штраф за раширение пробела | Not listed |
| **3.9.** | equal flow | равный поток | Not listed |
| **3.10.** | decoupled | развязанный | Not listed |

Given these challenges, it is clear that graduate students need to develop skills to create glossaries of terminological units and to work independently with bilingual dictionaries and terminological resources. The ability to create glossaries of key terms in their academic disciplines is an essential part of academic training. In order to improve students' academic preparation, systematic training in the use of terminological resources is required. Taking a course in professional foreign language study, which includes the creation and use of bilingual glossaries, as well as a critical analysis of the results of automatic translations, will help avoid errors associated with the improper use of foreign scientific terminology.

While many academic studies focus on teaching aspiring translators and linguists to translate terms, including multi-component ones, there remains insufficient research on training master's students in non-linguistic fields. Students with agricultural and technical specializations often lack the necessary skills to translate technical terms correctly, which negatively impacts their ability to fully utilize international research in their academic work. It is particularly important for them to recognize and correctly interpret compound terms that play a key role in scientific communication.

There is a need to develop new methods and approaches aimed at providing students at non-linguistic universities with the necessary skills to translate and use scientific terminology. Techniques and methods that are effectively used for the training of linguists cannot be directly adapted to the educational process of non-linguistic students, as they often lack a sufficient theoretical linguistic background (Lutfullina, 2021).

One of the most effective solutions to this problem is to teach students how to create English-Russian glossaries for their specific research topics. This not only deepens their understanding of the specific field, but also develops their skills in translating and interpreting scientific terminology (Yuklyaeva, 2020).

Each Master’s Degree student explores a narrow topic and requires an in-depth understanding of the terminology characteristic of their field. Teachers need to organize the educational process so that the emphasis is on the independent and individual work of students with foreign language terminology. Such an approach helps to develop skills for in-depth analysis and understanding of technical terms, thereby improving students' professional competence. Importantly, this work is based on specialized text corpora that contain current and contextual information. These corpora may include scholarly articles, reports, monographs, and other sources that reflect the latest advances and trends in the field. Access to contemporary texts allows students to follow changes and evolution of terminology in response to new research and technologies (Valeeva, 2021). Students with insufficient language skills often have difficulty identifying compound terms in specialized texts, hindering their understanding and assimilation of key concepts in their field. Therefore, it seems advisable to teach students to use digital tools for term extraction, which serves the purpose of this study.

One of the most user-friendly platforms is TermoStat Web that allows quick identification of compound terms and their contextual use, which is crucial for mastering technical vocabulary. Research shows that TermoStat Web is comparable in functionality to tools like Sketch Engine and AntConc (Novikova, 2020). By integrating TermoStat Web into the educational process, students can find and interpret compound terms more

effectively, improving the quality of their research work. This study proposes to use the TermoStat web platform as an efficient tool for extracting, analyzing and structuring terms, enabling a deeper understanding of subject-specific terminology.

## AIM AND OBJECTIVES OF THE STUDY

The paper aims to develop an effective technology for teaching students to utilize digital tools for the identification, analysis, translation, and organization of specialized English vocabulary.

To accomplish this aim, the study sets the following objectives:

- To analyze the potential of digital terminology tools and corpus analysis methods for identifying and structuring specialized terms.
- To propose strategies for teaching students to use TermoStat Web for effective term extraction.
- To outline an approach for guiding students in the creation of English-Russian glossaries using the digital platform Notion.
- To formulate recommendations for integrating these glossaries into translation systems and CAT tools to enhance the precision and consistency of translations.

## METHODOLOGY FOR STUDENTS' WORK WITH TERMOSTAT WEB

The methodology comprises sequential stages aimed at developing students' skills in utilizing digital terminological tools and creating specialized glossaries, thereby enhancing the quality of English-Russian translation of scientific and technical texts.

The process of working with TermoStat Web is divided into successive phases, each of which enables students to examine and organise specialized terms. This structured approach enables a deeper understanding and acquisition of subject-specific vocabulary.

**Preparation of the Text Corpus**

In the first phase, texts are collected and prepared that summarize the key concepts and topics of the subject area. Students are instructed to select multiple articles, lectures, and academic publications, copy the content, and save it as a single TXT file. This file serves as a corpus – the starting material for the terminological analysis.

**Analysis and Grouping of Terms**

After uploading the texts to the platform, students receive access to a generated list of terms that can be sorted by frequency of occurrence and other characteristics. It is recommended to first group simple, one-component terms according to their parts of speech that are most frequently used in the text. Grouping terms by parts of speech helps students identify key concepts and attributes within the subject area.

**Analysis of Word Formation**

Many technical terms are formed by adding suffixes and prefixes. Identifying root words allows students to uncover logical connections between terms and concepts. For example, the discovery of a common root in terms can indicate their semantic proximity and functional relationships. This approach not only deepens students' understanding of

terminology, but also improves their ability to analyze and systematize subject-specific vocabulary.

**Using Templates**

With TermoStat Web it is possible to arrange terms using certain templates. For example, students can group phrases using an adjective + noun template. This makes it possible to examine the meaning that the adjective conveys and to assess how fixed the phrase is in relation to the subject. Thanks to these structuring techniques, the lexical and syntactic patterns that characterize terminology can be examined in more detail (Figure 6).

| | | | | |
|---|---|---|---|---|
| **data-driven** | 27 | 39742.42 | *data-driven* | Adjective |
| **data-driven agri-tech** | 1 | 1471.94 | *data-driven agri-tech* | Adjective Common_Noun |
| **data-driven agricultural technology** | 2 | 2943.87 | *data-driven agricultural technology* | Adjective Adjective Common_Noun |
| **data-driven agriculture** | 12 | 17663.26 | *data-driven agriculture* | Adjective Common_Noun |
| **data-driven agriculture approach** | 1 | 1471.94 | *data-driven agriculture approach* | Adjective Common_Noun Common_Noun |
| **data-driven agriculture technology** | 1 | 1471.94 | *data-driven agriculture technologies* | Adjective Common_Noun Common_Noun |
| **data-driven approach** | 2 | 2943.87 | *data-driven approach* | Adjective Common_Noun |
| **data-driven decision** | 1 | 1471.94 | *data-driven decision* | Adjective Common_Noun |
| **data-driven method** | 1 | 1471.94 | *data-driven methods* | Adjective Common_Noun |
| **data-driven sustainable agriculture practice** | 1 | 1471.94 | *data-driven sustainable agriculture practices* | Adjective Adjective Common_Noun Common_Noun |
| **data-driven technology** | 1 | 1471.94 | *data-driven technology* | Adjective Common_Noun |
| **data-intensive field** | 1 | 1471.94 | *data-intensive field* | Adjective Common_Noun |
| **data-scarce sector** | 1 | 1471.94 | *data-scarce sector* | Common_Noun Common_Noun |
| **datum** | 100 | 23690.88 | *data* | Common_Noun |
| **datum access** | 1 | 1471.94 | *data access* | Common_Noun Common_Noun |
| **datum collection** | 5 | 3674.85 | *data collection* | Common_Noun Common_Noun |
| **datum collection mean** | 1 | 1471.94 | *data collection means* | Common_Noun Common_Noun Common_Noun |
| **datum curation** | 2 | 2943.87 | *data curation* | Common_Noun Common_Noun |
| **datum harvest** | 1 | 1471.94 | *data harvest* | Common_Noun Common_Noun |
| **datum industry** | 1 | 1471.94 | *data industry* | Common_Noun Common_Noun |
| **datum integration** | 1 | 1471.94 | *data integration* | Common_Noun Common_Noun |
| **datum mining** | 1 | 1471.94 | *data mining* | Common_Noun Common_Noun |
| https://termostat.lino.umontreal.ca/contexte.php?num=564&file=data8209driven_agricul... | | 1471.94 | *data products* | Common_Noun Common_Noun |

**Figure 6**. TermoStat Web

**Grouping Terms into Patterns**

Grouping terms into structural patterns helps students gain a deeper understanding of the internal logic of terms and identify how specific lexical items accurately describe the core concepts of a text. This approach enables a more systematic exploration of terminology and its functional relationships within the subject matter.

**Creating a Glossary**

The subsequent step involves organizing the identified terms into a thematic glossary. Students are advised to group terms either by topic (e.g., “soil,” “technology,” “research methods”) or by complexity (e.g., from single-component to multi-component terms). This thematic arrangement allows students to identify logical connections between key terms and better understand their relationships within the broader context of the subject area.

**Analyzing Terms in Context**

To achieve a comprehensive understanding of a term, students are encouraged to examine its usage in the context. TermoStat Web offers sentence examples (Figure 7) and KWIC (Key Word in Context) (Figure 8), which display sentences containing the selected term. This functionality enables students to observe the use of terms in specialized literature, recognize their typical functions, and discern any connotations they may carry.

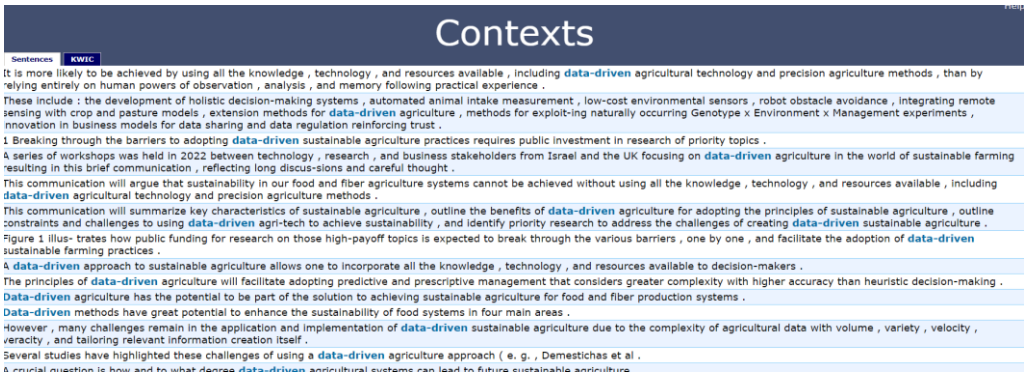


**Figure 7**. TermoStat Web Sentences Tool

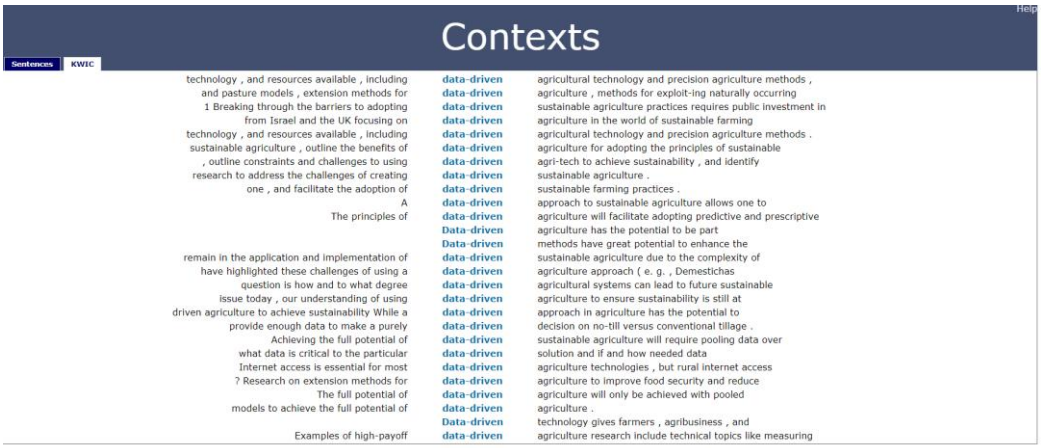


**Figure 8**. TermoStat Web KWIC (Key Word in Context) Tool

## DICTIONARIES AND THESAURI

To create a high-quality English-Russian terminological glossary in the field of agriculture, it is important to teach students how to effectively use specialized dictionaries, thesauri and online resources. These tools not only simplify the process of translating and understanding key concepts, but also help students see relationships between terms, promoting a deeper understanding of the subject matter. In the initial phase, students are encouraged to work with scientific dictionaries of the universities. These dictionaries provide detailed explanations of terms and are therefore particularly valuable for students who want to gain a basic understanding of specialist terminology.

In later phases, the focus shifts to multilingual glossaries developed by international organizations, such as:

FAO Term Portal: This portal provides access to official terminology of the Food and Agriculture Organization of the United Nation (FAO), including precise translations and definitions, which are crucial for ensuring consistency and accuracy in agricultural terminology.

AGROVOC: AGROVOC is a multilingual thesaurus developed by FAO, covering a broad range of agricultural and related fields. It facilitates the exploration of terminological relationships and enables students to analyze connections between terms across different languages and disciplines.

As students engage with specialized terminology, they can utilize a range of resources to gain a comprehensive understanding of each term. For instance, comparing AGROVOC with the FAO Term Portal provides complementary insights into both the meaning and usage of terms.

The FAO Term Portal serves as a dictionary, offering precise definitions and official translations of terms. Its primary objective is to standardize language by providing authoritative FAO-approved terminology, ensuring accuracy and consistency across contexts. This resource is particularly critical for validating and aligning agricultural terminology with international standards.

Conversely, AGROVOC facilitates a broader exploration of terms by presenting related concepts and revealing the intricate relationships among terms within specific subject areas. This functionality is especially beneficial for examining connections in highly specialized fields, enabling a deeper understanding of the conceptual framework underlying the terminology (See Figures 9-10).

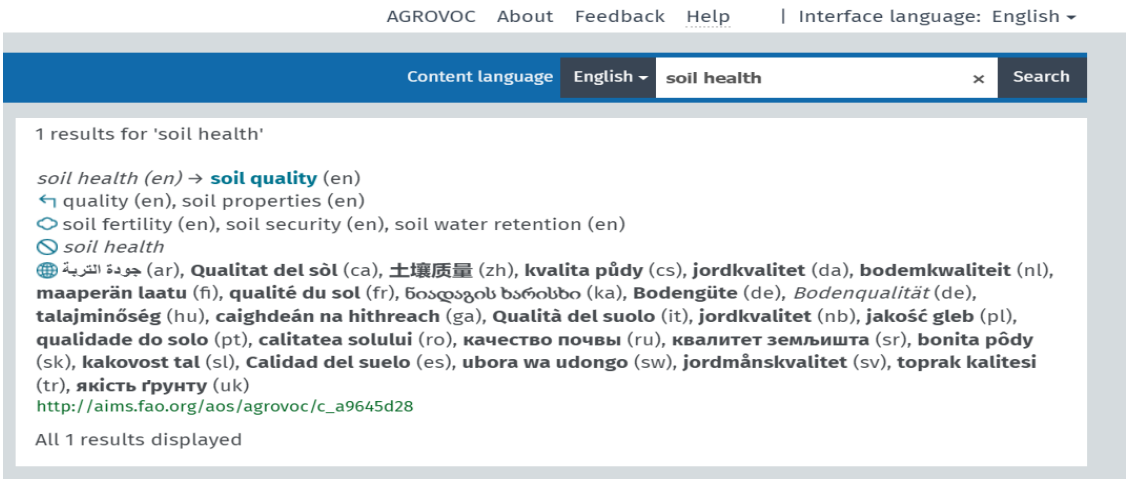


**Figure 9**. AGROVOC

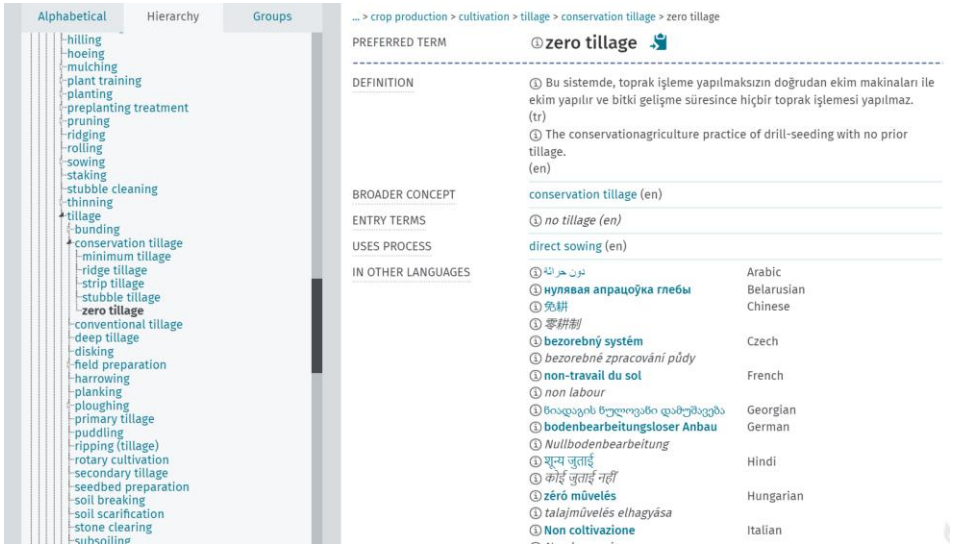


**Figure 10**. AGROVOC

## AGROVOC-BASED TASKS

Click on the chosen entry to see its relationships. Pay attention to:

- ✓ Preferred Term: AGROVOC's standardized term for the concept.
- ✓ Definition
- ✓ Hierarchy: broader terms and narrower terms. This shows you how this term fits into the bigger picture.
- ✓ Related Terms: conceptually connected terms. These links expand the scope of your exploration.
- ✓ Translations: Find Russian equivalents.
- ✓ Compare: Russian and English definitions, broader and narrower terms, related terms.

Another valuable resource for clarifying the terminology that we introduce to students is WIPO Pearl (See Figure 11). WIPO Pearl is a terminology database developed in 2014 by the World Intellectual Property Organization (WIPO) to ensure the accurate and consistent use of scientific and technical terms in the ten languages used in the Patent Cooperation Treaty (PCT) patent system. Experienced linguists and terminologists at WIPO review and assign reliability scores to terms derived from international patent applications filed under the Patent Cooperation Treaty (PCT). The database covers 29 subject areas, including emerging areas such as quantum computing and medical robotics. Each term is accompanied by examples and has a unique URL to access the full terminology dataset.

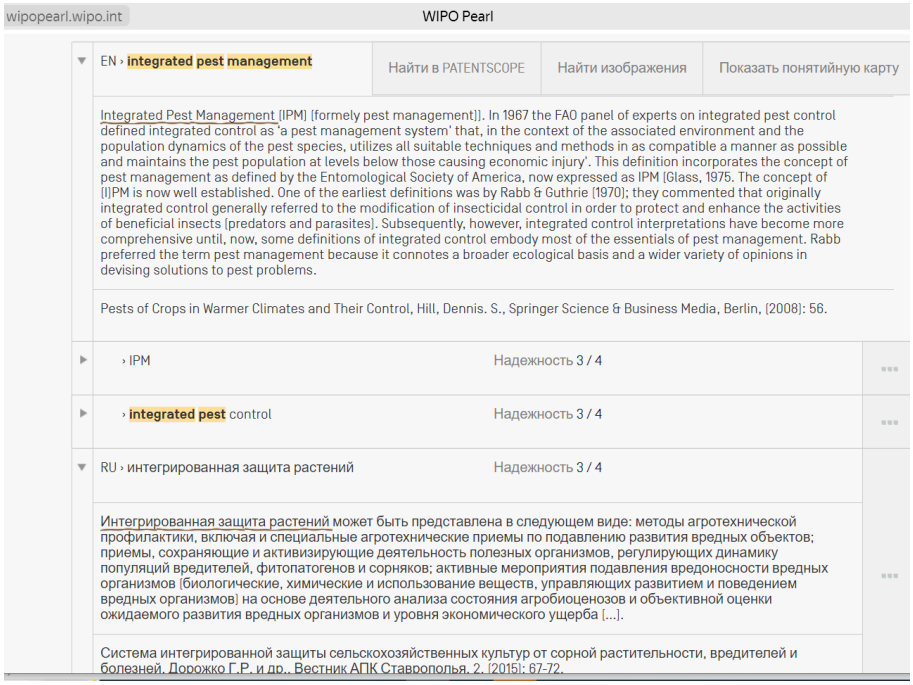


**Figure 11**. WIPO Pearl

## DIGITAL TOOLS TO CREATE GLOSSARIES

After being introduced to databases such as AGROVOC and WIPO Pearl, students create their own glossary using the digital tool Notion. With Notion, students can structure and efficiently manage the information they collect, creating a dedicated database for their glossary. The tool supports adding translations, definitions, related terms, examples, and thematic categorization of terms. Additionally, students can link from their Notion glossary to external websites or resources to provide additional context and further reading material or to cite their definitions. Notion also offers a variety of data visualization formats and the ability to collaboratively edit and update the glossary in real time. This makes it a valuable resource for academic and research activities. The English-Russian glossary created in Notion can serve not only as a learning tool, but also as a basis for improving the quality of translations in a subject area. In addition, the glossary can be integrated into professional translation systems such as CAT (Computer-Assisted Translation) tools as well as online translators such as Yanlex and DeepL. This integration allows standardized terms to be automatically applied during translation, minimizing the risk of errors and improving conceptual accuracy.

## CONCLUSION

To sum it up, it is worth taking into consideration that usually non-linguistic students have no or little interest in language learning as it is traditionally a difficult task for them often regarded as a tedious and error-prone one. The rise of digital translation technologies has opened up new opportunities, which unfortunately are often considered

by the students as an exemption of normal learning routine. However, as it has been shown in the present paper the technology can at the same time be both motivating and helping to cope with difficult academic and scientific texts.

The research has presented an overview of a number of modern dual-purpose digital tools – of glossary compilation, on the one hand, and learning specific terminology, on the other hand. The use of these instruments allows students to acquire the needed language skills more efficiently. The methodology outlined in this article provides a comprehensive approach to students' work with specialized terminology, using various digital tools of different nature providing learners with ample opportunity to handle a text as a whole rather than its isolated units as it used to be in traditional foreign language acquisition. Being versatile and multipurpose, giving a wider scope of the meaning than a conventional dictionary, all these tools permit to overcome the usual fear to face and reluctance to process a long foreign language text provided careful guidance is given.

It is recommended to use all the reviewed tools, namely TermoStat Web, AGROVOC, WIPO Pearl, and Notion as a complex, in the order described in the paper. By systematically preparing a text corpus, analyzing and grouping terms, exploring word formation, and employing templates, students enhance both their academic knowledge and translation skills.

The combination of TermoStat Web for term extraction, AGROVOC/WIPO Pearl for verification, and Notion for glossary organization addresses distinct aspects of terminology acquisition. TermoStat's corpus analysis capabilities proved particularly valuable for identifying recurring term patterns in agricultural literature, while AGROVOC's relational structures helped students contextualize concepts.

Our framework strategically combines three types of digital tools, each serving distinct complementary functions. TermoStat Web extracts high-frequency and field-relevant terminology directly from agricultural texts /corpora, revealing actual usage patterns. By exposing these patterns, TermoStat engages students in active terminology processing rather than passive term reception.

AGROVOC and WIPO Pearl provide authoritative verification through standardized definitions, addressing the frequent inaccuracies in machine-translated terms. AGROVOC’s hierarchical trees help students visualize relationships between concepts (broader/narrower terms, related concepts), while WIPO Pearl’s discipline-specific definitions clarify ambiguities in emerging terms. This step is critical when applying tools like Yandex or DeepL.

Notion offers flexible organization of verified terms into personalized, searchable glossaries.

This approach directly targets the weaknesses observed in student practices. By forcing engagement with corpus-derived terms and curated databases, students develop critical evaluation skills and create reusable, research-specific resources that grow with students’ academic progress.

Among the advantages of the approach, the integration of digital tools into terminology teaching has fundamentally transformed the landscape of English for Specific Purposes (ESP) instruction. Technology extends human pedagogical capacities in remarkable ways that were not possible through traditional methods. While a

generation ago learners had to compile terms from paper dictionaries, today's students can map entire conceptual networks across thousands of documents, identifying subtle variations in usage.

However, these technological advantages come with significant intellectual responsibilities, which result in certain shortcomings, namely blind trust in and excessive dependence on the digital tools, overlooking the specialized knowledge needed to verify terminological accuracy thus potentially leading to serious miscommunications in international research collaborations. Our research shows that careful guidance provided by the teacher enables students to take more responsibility and to rely on their own effort.

Looking ahead, the challenge for ESP instructors will be to maintain this delicate balance. As generative AI systems become more sophisticated, they generate significant instructional dilemmas for foreign language acquisition. The solution, as our methodology suggests, lies in redesigning learning experiences and providing learner-led investigations based on digital tools. By training students to critically evaluate digital outputs against authoritative sources, we develop professionals capable of informed tool usage.

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