

## Lexicogrammatical aspects in English for dentistry acquisition materials

### *Zobārstniecības jomā lietojamās angļu valodas apguves materiālu leksiski gramatiskais aspekts*

Indra Karapetjana, Gunta Roziņa

Department of English Studies  
Faculty of Humanities, University of Latvia  
Visvalža iela 4a, Riga, LV-1050, Latvia  
E-mail: [indra.karapetjana@lu.lv](mailto:indra.karapetjana@lu.lv), [gunta.rozina@lu.lv](mailto:gunta.rozina@lu.lv)

In the 21<sup>st</sup> century, globalization and massive migration have increased the global demand for effective transnational communication skills in English in the health care workplace and academic contexts, including dentistry. English for Dentistry falls under the umbrella of English for Specific Purposes (ESP): this refers to teaching and learning English as a foreign language in a particular domain. While the role of grammar acquisition in ESP courses is often understated in the key theoretical literature on ESP, this article highlights the importance of lexicogrammatical knowledge. Dentistry students and practitioners in Latvia highly value the accuracy in communication since the knowledge of various syntactic and morphological rules of grammar and their use in the dentistry-related context contribute to the accuracy required in the performance of different communicative tasks, for instance, asking for, explaining, and providing information, giving instructions. Besides, if dentists are unable, for example, to explain a diagnosis, agree on treatment options with the patient in a meaningfully accurate way, the dentist's authority may be undermined, resulting in unsuccessful communication. The case study reports on the tasks employing lexicogrammatical strategies in the material "Dentistry and Language Integrated Learning", which has been developed by the authors of this article working in close collaboration with individual academic staff at the Faculty of Medicine of the University of Latvia. The material piloted amongst both dentistry practitioners and students suggests that the applied strategies of morphological derivation, for instance, recognizing and building new words by gaining control of affixation devices, can be considered as useful tools in the new lexeme meaning-making process in dentistry. As a result, this study has attempted to support the assumption that ESP and content and language integrated learning (or CLIL) are compatible and can be efficiently mastered in the professional discourse development process.

**Keywords:** English for Dentistry; lexicogrammatical aspects; derivational morphology.

## 1. Introduction

English for Specific Purposes (ESP) as an approach in applied linguistics focuses on learners' current and/or future academic or occupational communication needs that would enable them to function in the target academic or professional situation using the English language. ESP is a broad field, and it comprises two main branches, namely, English for Academic Purposes and English for Occupational Purposes, which, in turn, are divided into various sub-branches (for example, Dudley-Evans, St John 1998, 6; Anthony 2018, 14). In the context of the present study, English for Dentistry is seen as a sub-branch of English for Specific Academic Purposes and English for Specific Occupational Purposes.

The existence of English for Dentistry owes much to the spread of English as a lingua franca of science, medicine, health care, dentistry, as well as to the use of English as a medium of medical education in non-Anglophone countries. English for Dentistry is an approach to English language training in dentistry-related disciplinary discourses which addresses the current and/or future academic and/or occupational language needs of learners with the help of meaningful English language acquisition materials and methods. Academic needs in dentistry refer to the study-related needs of learners at university, while occupational needs refer to the needs of learners in a workplace setting. It should be noted that the language needs of dentistry practitioners can address the areas of their professional and/or scholarly interests.

Discourse acquisition in any discipline, including dentistry, depends on comprehensible input. Admittedly, disciplinary discourse in dentistry is established through spoken and written modes of communication. To gain competence in dentistry discourse construction and to meet the communicative needs of language learners, it is vital to identify and describe lexicogrammatical patterns that govern this disciplinary discourse. Following the identified patterns that are necessary for performing a variety of communicative tasks seems to be an essential prerequisite for meeting the communicative needs of language learners as well; this, for example, can be referred to as acquiring such language strategies as asking for information, explaining the medical condition, providing a patient with information, or offering medical assistance.

Thus, the present study aims to determine lexicogrammatical commonalities that characterise the word-building principles applied in the field of dentistry and to take those typical features as "a benchmark" for dentistry-related content acquisition.

The research methodology was established considering its qualitative perspective, where a case study design was used to gain a profound understanding replete with meaning for dentistry and language integrated learning, focusing on discovery rather than on confirmation. Following the student-centred approach, which provides an important methodological perspective on language study and constitutes the core of the state-of-the-art in the educational field, the study attempted to emphasize the significance of student-centred exploration over

teacher-centred explanation. Research findings were derived considering the empirical results achieved while conducting Erasmus+ project “Dentistry and Language Integrated Learning”, which, by and large, has gained the project quality nomination “Wings 2019” (*Spārni 2019*) awarded by the Ministry of Education and Science, Latvia in 2019.

The case study under analysis refers to the study of the particularity of a single case, namely, the word-building acquisition strategies the use of derivational affixes as a meaning-making process in the blended learning material “Dentistry and Language Integrated Learning” (Roziņa, Henkuzena, Karapetjana 2018).

The design of the case study had four main components. First, in the pre-stage of material development, the following research questions were posed: What are typical word-building patterns of the dentistry register? What types of word-building strategies can be used to assist learners in acquiring the patterns? The research pre-stage envisaged close collaboration with individual academic staff at the Faculty of Medicine, the University of Latvia, with the purpose to align the needs of the target groups, the dentistry practitioners, with the work they carry out or with the work the students, would-be dentists, would do in the professional context in the future. Being advised and guided by dentistry field specialists, the authors of the present research selected relevant dentistry-related texts and figured out lexicogrammatical patterns that were embedded in the texts selected. As a result, meaningful tasks employing lexicogrammatical acquisition strategies were designed. Second, in 2017, the designed materials were piloted within a group of ten practising dentists who represented the Faculty of Medicine of the University of Latvia. During this period, twelve practising dentists, who work in rural and urban areas in Latvia, provided their insightful comments. Third, considering the obtained evaluative reviews from the practising dentists, the exercises and tasks were adjusted. Fourth, as a post-stage of the blended-learning material development, the tasks were piloted with a group of eleven disciplinary students, who attended a summer school as part of the Erasmus+ project “Dentistry and English Language Integrated Learning” in 2018. At this point, it is important to note that dentistry and language learning refers to a situation in which English is used as a tool in the learning of dentistry in which both the language and the subject have a joint role.

## 2. Grammar acquisition in ESP

Although the role of grammar acquisition in ESP courses is often understated in the key theoretical literature, it is the context that determines the use of grammar that must be attended to; thus, it is important to give attention to grammatical accuracy if this interferes with the comprehension of meaning (Dudley-Evans, St John 1998, 80). Consequently, lexicogrammatical content in ESP courses is relevant to meet the communicative expectations of the discipline.

The term ‘lexicogrammar’ (for example, Halliday, Matthiessen 2004, 7) refers to the interdependence of grammar and vocabulary in the process of meaning

making. Also, Lewis (1993, 137) emphasizes the same relation between grammar and vocabulary: “Individual words [...] have their own grammar” and contends that “grammar is the search for powerful patterns” (ibid.). From a discourse perspective, the study of grammar cannot be delimited from semantic and lexical considerations. In this study, we use the terms ‘lexicogrammar’ and ‘grammar’ interchangeably to refer to the typical lexical and grammatical environment of a sign as it is used in dental discourse.

It is possible to identify three types of grammar practice: mechanical, meaningful, and communicative (Apse, Farneste 2020, 5–6). Mechanical tasks focus on the form and can be practised by drilling, while meaningful tasks make use of model texts by raising learners’ awareness of the use of the form in real-life contexts. The third type of grammar practice implies that learners produce their own texts using the form and meaning (ibid.).

As claimed by Ellis (1997), in form-focused instruction, production-based instruction has been a traditional approach in grammar teaching. Various techniques for eliciting the production of targeted structures from learners exist, for instance, games, substitution drills, and blank-filling exercises. By referring to various empirical studies, Ellis (1997, 83) provides evidence that “the effects of form-focused instruction allow learners to manipulate the acquired structures consciously as well as use them accurately in communication”.

Input-based instruction defined as instruction that “involves the manipulation of the input that learners are exposed to or are required to process” (Ellis 2012, 285) emphasizes the importance of conscious noticing in input; this implies making learners aware of some grammatical features and their role in meaning comprehension in discourse and communication.

Ellis (2012) notes that both approaches can be effective as proved by the studies conducted to investigate the feasibility of both types of instruction.

### 3. Word-building patterns in dentistry

Dentistry is known for its large number of dental terms, which often originate from Latin and Greek (Dofka 2013). Since dental terminology is largely “standardized for formation, pronunciation, pluralization and meaning of terms” (Dofka 2013, 3), it is important to raise learners’ awareness of the main rules of the formation of terms.

Words are often formed by compounding, inflection, and derivation. A single- or double-root structure of the dental term in English provides the foundation for the term. When two roots are combined, a combining vowel *o* may be used to form a term, for example, the term *distocclusal* is formed from the roots *distal* and *occlusal*. Most of the content words in English can change their form by adding inflectional suffixes and/or derivational prefixes and suffixes, which qualify the meaning of the word. Some bound morphemes exhibit fundamental and generative features of English grammar, for example, the inflectional morpheme *-ed*, which is used to form the past tense of regular verbs. However, the generative

feature of the suffix *-s* for most plurals does not function well with dental terms, as much of the terminology in dentistry originates from Latin and Greek, so the rules for changing terms from singular to plural are predetermined by the conventions of those languages. For example, the ending *-a* in *gingiva* is changed to *ae*, by adding *-e* to make the plural form *gingivae*. The suffix *-er* is added to the verb *to examine* to indicate a person, *examiner*.

The present study deals with derivational affixes because they are more productive than inflectional suffixes; they provide syntactic and semantic information and are associated with more complex syntax of written discourse. Moreover, the word class of many words can be identified by the observation of their endings. To exemplify, the noun formation endings *-ology* (*histology*) and *-gnosis* (*diagnosis*) are typical noun endings and as such they form part of a pattern-generating system, which learners need to be aware of.

Adding affixes to existing words to form new words is common in English for dentistry. A prefix often indicates such information as quantity, colour, size, condition, location, for example:

- (1) *bi-* [two] as in *bifurcation* (in the meaning of quantity)
- (2) *hemi-* [half] as in *hemisection* (in the meaning of size)
- (3) *cyan-* [blue] as in *cyanosis* (in the meaning of colour)
- (4) *mal-* [bad] as in *malocclusion* (in the meaning of condition)
- (5) *ante-* [in front] as in *anterior* (in the meaning of location)

A derivational suffix qualifies or describes the meaning of the term. In dentistry discourse, suffixes may denote medical conditions, medical processes, or agents / persons concerned, for example:

- (6) *-ism* as in *bruxism* (in the meaning of tooth grinding)
- (7) *-opsy* [view] as in *biopsy* (in the meaning of medical processes)
- (8) *-ist* as in *orthodontist* (in the meaning of an agent/person involved)

Nation (2003, 263) emphasizes that language can be learnt “through being taught or deliberately learning new words, through learning new words by meeting them in context, and through recognising and building new words by gaining control of prefixes, suffixes and other word building devices”. Thus, consciousness-raising of the morphological structure of words and the combining methods can assist English language learners in the understanding of word meanings, in guessing them from context and the learning of unfamiliar words by relating these words to known words or affixes.

#### 4. The case study

The process of material design followed a five-step sequence (Tomlinson 1998, 97). First, a need to develop materials in the field of dentistry and in the field of English language learning and their focus were identified in a survey administered

as part of the Erasmus+ project “Transversal Skills in Dentistry: Content and Language Integrated Approach”. It was concluded that dentists’ interpersonal, communication and social skills can be enhanced with the help of teaching materials that focus on maintaining a high degree of linguistic accuracy. As a result, dentists had an opportunity to use the acquired language in anticipated and/or complex linguistic situations, which developed their skills of coherent discourse construction (Karapetjana et al. 2017, 96). Second, texts were searched for and selected by the authors of this article working in close collaboration with individual academic staff at the Faculty of Medicine, the University of Latvia. Third, pedagogical realization of materials was implemented by meaningful input and form-focused instruction that emphasizes input processing. Fourth, physical production of materials took place, involving technical consideration of layout, type, size, and visuals.

The material design process was based on a well-known model by Hutchinson and Waters (1987, 109); it reveals that four main elements underlie material design, such as the input, content focus, language focus and task. The model suggests that language is acquired when comprehensible input is obtained, presented to learners through reading and listening. The input needs to be comprehensible, that is “material which relates to what we already know, but in some way modifies or extends it” (Lewis 1993, 25). Moreover, such factors as the needs of the target groups of learners, the learners’ attitude, motivation of the learner to turn input into intake, and the authenticity of the material were considered.

The content served as a means of conveying information and as a basis for revealing the subject matter of dentistry. Selecting authentic texts and adjusting them was a very challenging task, given the wide range of resources available. Considering this, the related tasks were designed so that they enabled the learners to transmit the dentistry-related information by a meaningful use of the acquired language.

The designed in-house study material (Roziņa, Henkuzena, Karapetjana 2018) consists of five units:

- 1) “Clinical Audit in Dentistry”;
- 2) “Communication and Crisis Communications”;
- 3) “Development of Interpersonal Communication Skills in Dentistry and in Oral Medicine”;
- 4) “Dental Diagnostic Terminology”;
- 5) “Early-Age Orthodontic Treatment”.

Each unit follows the following pattern: “General description”, Part 1 “Reading and reading strategies”, Part 2 “Lexicogrammar”, Part 3 “Follow-up assignments”.

Being aware of the knowledge type distinction by Tyler and Nagy (1989) and due to the focus of this study, the discussion below offers some insights into Part 2 “Lexicogrammar” of the developed study material. It focuses on selected approaches being adopted for enhancing learners’ derivational morphology awareness, which consists of relational, syntactic, and distributional aspects.

Relational knowledge allows learners to recognize that words are morphologically related to each other as well as recognize morphemes in words

and their meaning. For example, the noun *dentition* is related to the adjective *dental*. Syntactic knowledge helps learners be aware of the primary function of the derivational suffix, namely, changing the syntactic category of a word. For example, learners know that *illness* is a noun, as it is formed by being suffixed with *-ness* from the adjective *ill*. Distributional knowledge helps learners understand linguistic restrictions on the connections of roots and suffixes. This is influenced by the syntactic category of the word and how the derived words function in sentences. For example, the suffix *-ly* can be added to adjectives, as in *deep – deeply*, but not to nouns.

The designed material offers explanation of word-building patterns and the meaning of affixes. It is based on the principle that lexicogrammatical tasks are based on raising learners' awareness of the derivational patterns which underlie the texts in dentistry to which they are exposed in the study material. Awareness-raising is part of the process the learner can go through with new language in context, both the context of dentistry and co-text. It is expected that learners first become aware of the new affixes, recognise, distinguish, and then produce them. To reflect on practical activities pertaining to the use of lexicogrammatical strategies employed in the developed study material and to focus on their diversity, the following activities were grouped, considering:

1. Meaning creation in dentistry-related discourse, for example:

- (9) Match each prefix (*albus-*, *chlor-/o-*, *erythr-/o-*) in Column A with the colour (*white, blue, red*) it represents in Column B.
- (10) Underline the prefixes (*unilateral*) used in the following terms and write in the table what number or amount each represents (*one side*).
- (11) Give the meaning of the prefix underlined in the following words (*ultra-sonic, isograft*).
- (12) Using the prefixes given (*ecto-*), choose the prefix that best describes the meaning of the term (*outside*).
- (13) Match the prefix (*contra-*) in Column A to the term (*against*) it best describes in Column B.
- (14) Find the words in the text that are derived by means of the suffixes *-ial*, *-al*, *-ist*, *-ment*, *-ing* and fill in the table below. Discuss their meaning in context.
- (15) Study the bolded words in each sentence; underline the suffix denoting a medical procedure of the root element. Give the meaning of the word (*an endodontist may recommend an **apicoectomy**, if a second root canal cannot be performed*).
- (16) Explain or translate the literary meaning of the terms (*dented, dentine, dentistry, dentition, denture, denturist* formed from the root *dent*).
- (17) Explain the meaning of the terms (*ectoblastic, mesoderm, entelechy*, to encamp considering the meaning of the Greek prefixes *ecto-*, *ento-*, *meso-*, *en-*).

2. Language function allocation, for example:

- (18) *Decide whether the following words are well-formed or ill-formed. Write “Yes” next to the well-formed and write “No” next to the ill-formed words. (gingival – “Yes”, pharyngic – “No”).*
- (19) *Pay attention to the way the highlighted structures are formed and then produce sentences of your own using these structures.*

The above-mentioned activities were aimed at increasing learners’ awareness of derivational morphology in real-life dentistry context. During the piloting stages of the study material in 2017 and 2018, the target learners were involved in a series of activities that drew their attention to morphological forms within meaningful dentistry contexts. It was observed that the learners were quite successful in recognizing morphological relations between words that share a common morpheme (relational knowledge), they showed awareness of the syntactic properties of suffixes, especially when used in context (syntactic knowledge), while the acquisition of distributional constraints seemed less successful (distributional knowledge), as it required both comprehension and production. Overall, it can be said that the offered form-meaning tasks of word-building patterns in dentistry helped to raise the learners’ awareness of the derivational affixes used in the context of dentistry.

Practice of lexicogrammatical aspects in the material is not only sentence-based; rather, it is discourse-based. It was expected that learners’ awareness of derivational morphology would lead to enhanced lexicogrammatical knowledge, as well as better performance involving the knowledge of derivational morphology. Lexicogrammatical practice aimed at improving learners’ ability to produce coherent texts is discussed in Part 3 “Follow-up assignments” of the designed material, but it is not the focus of this study.

## 5. Conclusions

The present study stemming from the Erasmus+ project “Transversal Skills in Dentistry: Content and Language Integrated Approach” has arrived at the following conclusions:

1. Focusing on communication skill development to meet the target needs of language users is important in ESP; however, the role of lexicogrammatical aspects in the language acquisition process should not be underestimated, as grammar helps to make and understand meaning and, thus, is an important communicative goal.
2. Dentistry students and practitioners set a high value on accuracy in communication in health settings since the knowledge of various syntactic and morphological rules of grammar and their use in the dentistry-related context contribute to accuracy necessary to perform different communicative tasks, for instance asking for, explaining, and giving information, giving



- instructions. Besides, if dentists are unable, for example, to explain a diagnosis, agree on treatment options with the patient in a meaningfully accurate way, the dentist's authority over a patient may be undermined, resulting in unsuccessful communication. Thus, language plays a significant role in health care, including, dentistry as effective / accurate dentist-patient communication is widely recognized as important to clinical outcomes.
3. The knowledge of lexicogrammatical aspects is particularly useful for learners with specific goals in language use, namely reading texts in a particular discipline, writing reports, participating in subject specific conferences, communication with patients and so on.
  4. ESP materials developers and practitioners should be aware of the importance of derivational morphology in English for dentistry and should make learners aware of the functions of derivational morphemes in the context of meaningful language production.
  5. Establishing a solid synergy between the dentistry area and the use of the English language for instrumental purposes in the professional context can help to determine the choice of methodology for the development of the language resources to be used.

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## Kopsavilkums

21. gadsimtā globalizācijas, masveida migrācijas un ar to saistīto valodu kontaktu ietekmē ir palielinājusies akadēmiskās angļu valodas loma, t. sk. veselības aprūpē. Vispārēju profesionālu nepieciešamību pēc angļu valodas akadēmiskajā kontekstā izjūt arī Latvijā zobārstniecības nozarē studējošie un strādājošie medicīnas darbinieki, kā arī mācību procesā iesaistītie mācībspēki. Īpašu vajadzību apliecināt kvalitatīvas starptautiskās saziņas angļu valodas iemaņas izjūt mācībspēki darbā ar ārvalstu studentiem. Zobārstniecības jomā izmantojamā angļu valoda ir attiecināma uz speciālā lietojuma angļu valodu (SLAV), par ko uzskatāma angļu valodas kā svešvalodas mācīšana un apguve noteiktā jomā. Nozīmīgākajos teorētiskajos darbos, kas saistīti ar SLAV, gramatikas apguves loma bieži vien nav bijusi pietiekami novērtēta, tāpēc par aktuālu šī raksta akcentu uzskatāma leksiski gramatisko zināšanu nozīme atbilstīgajā kontekstā. Zobārstniecības studenti un praktizējošie zobārsti Latvijā ir noteikuši augstas prasības precīzam valodas lietojumam, jo korekts gramatikas lietojums zobārstniecības kontekstā sekmē saziņas precizitāti, kas nepieciešama, piemēram, lūdzot sniegt vai skaidrojot informāciju, kā arī dodot norādījumus pacientu ārstēšanā. Turklāt, ja zobārsts, piemēram, nespēj pacientam izskaidrot diagnozi vai vienoties par ārstēšanas paņēmieniem pacientam saprotamā un precīzā veidā, pacienta uztverē var pazemināties zobārsta profesionālā autoritāte, tādējādi saziņa var izrādīties nesekmīga un turpmākā sadarbība var būt apdraudēta vai pat neiespējama. Šis raksts sniedz ieskatu uzdevumos, kuri ir attiecināmi uz leksiski gramatisko paņēmieni lietojumu un ir atspoguļoti mācību līdzeklī „Zobārstniecība un valodas integrēta apguve”. Sadarbojoties ar atsevišķiem Latvijas Universitātes Medicīnas fakultātes mācībspēkiem, šo mācību līdzekli ir izstrādājušas raksta autore. Mācību līdzeklis ir izmēģināts gan praktizējošu zobārstu, gan zobārstniecības studentu vidē SLAV apguves procesā. Mācību procesā iegūtie rezultāti liecina, ka izmantotie morfoloģiskie vārdu darināšanas paņēmieni var tikt uzskatīti par noderīgiem valodas līdzekļiem jaunu leksēmu nozīmju veidošanas procesā zobārstniecībā.

**Atslēgvārdi:** zobārstniecības jomā lietojamā angļu valoda; leksiski gramatiskais aspekts; vārddarināšana.



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