

Semantic shift as a way of meaning specialization: the case of English e-learning terms

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Abstract

This article is devoted to the study of e-learning terminology in modern English. The processes of globalization and digitalization in the field of education and the rapid development of new Internet technologies have long been a catalytic force for the formation of e-learning terminology systems. The global pandemic situation has necessitated the transition of education to an electronic environment, thus revolutionized the education system and served as an impetus that caused a sharp increase in the frequency of e-learning terms usage in mass communication and contributed to the emergence of new terms in the researched sphere. In this regard, research aimed at identifying the specifics of e-learning terminology and the features of the meaning specialization is of particular importance. As a result of contextual analysis, a large array of newly emerged e-learning terms (1600 terminological units) was analyzed. The semantic study using the definition analysis and method of semantic differentiation shows that the semantic shift as a way of meaning specialization is a productive mechanism for the formation of new e-learning terms in modern English language. The results of the research contribute to the study of English lexicology and specifically terminology. The extensive illustrative material and the main findings of the study can particularly be used in the practice of teaching English for special purposes and in the development of e-learning materials in general.

Key words: semantic change, metaphorical reinterpretation, metonymic shift, terminological unit, term combination, compound term

Introduction

At the present stage, there is a steady increase in interest in the problems of terminology since the development of linguistic means that provide communication in a special field is inextricably linked with progress in science and technology. It should be taken into account that 80% - 90% of new lexical units appearing in the language are terms and other special lexical units, and the intellectualization of the language admitted by many scientists primarily refers to the widespread use of special vocabulary in the language (Leitchik, Shelov, 2003: 82). The high rate of information and communication technologies development inevitably entails a constant modification of educational processes carried out in the electronic environment, which is reflected in the vocabulary, particularly in the terminology of the language (Daille et al., 2004). The current state of the terminology fund is characterized by the formation of new terminology conceptualizing e-learning and the development of a transformation process, resulting in new terms to replace the existing ones. Thus, the relevance of this study is determined by the need for a detailed analysis of English terms in the field of e-learning, since electronic educational terminology, due to the widespread use of computer technologies, is a lexical system that integrates into the communicative space of modern society.

Of particular interest are the semantic transformations occurring in the lexicon of the modern English language, which contributes to the expansion and enrichment of the vocabulary, and also are a way of forming new terminological units. The importance and intensity of research into problems caused by the semantic shift is evidenced by the growth in the number of scientific publications and studies. Specifically, the

research by Falkum I. L. (2015), Kulevskaya E.V. and Dudik N.A. (2016), Popova E.P. (2018), Zaliznyak A. A. (2018) and others.

It should be emphasized that modern research is based on the classical typology of Bloomfield (1933), who singled out narrowing, expansion of meaning, metaphorization, metonymization as processes in which a semantic shift is observed. In addition, the fundamental ideas of Ulman (1962) that metaphor and metonymy are the causes of a semantic change, and the expansion and narrowing of meaning is their consequence, are of great importance for modern research. An attempt to study the processes of expanding and narrowing meaning in terms of e-learning was hence undertaken in several works devoted to the process of terminologization (Ossokina, 2019) and specifically to the problems of meaning expansion on the example of English e-learning terms (Ossokina, 2020). Thereby, the interest of this study is focused on the problem of meaning specialization of e-learning terms through the mechanisms of metaphorical and metonymic shift.

The relevance of this research also lies in the fact that terms and terminology are necessary tools for successful professional communication in the process of language teaching and learning. Mastery of the terminology is the main issue in the realization of any scientific knowledge. Indeed, the experts working in a particular field of human activity will not be able to fully realize their potential, not mastering the terminology: as a result of inadequate and inaccurate scientific and technical terminology, great difficulties arise as to the success of any activity. Due to the impact of the COVID-19 pandemic on education, the awareness of e-learning term formation and its semantics is more important than ever to provide environments for using new effective teaching methods and meaningful interaction.

Literature Review

The analysis of scientific literature on the problem under study has shown that the issues of metaphorization and metonymization of terms are widely considered. Thus, metaphors in scientific and technical languages are common phenomena and form part of technical and scientific communication (Finatto, 2010). Rather than being optional, metaphors permeate practice and research, providing conceptual lenses that help us understand issues and objects of concern. Metaphors promote creativity and innovation by highlighting the hidden facts of the subject of interest (Young, 2013). Metaphorical terms in the cognitive aspect have been studied in the works of Shirokolobova (2014), Matveeva L.A. and Matveeva N.V. (2017). Problems of metaphorical modeling have been considered by Deeva (2014), Mishankina and Deeva (2015). The process of metaphorization in a scientific text has been studied by Morozova and Smolyanina (2015). The problem of the conceptual design of metaphorical terminology database, the structure of metaphorical terminology database, nuclear and peripheral objects of the domain, connections between them and attributes of objects are investigated in the work of Mishankina and Panasenko (2016). Tabanakova (2018) considers the problem of decoding (understanding) metaphorical homonymous scientific terms. Alyahya (2018) has researched the use of visual metaphors in e-learning environments. In the article by Mishankina, and Rozhnev (2019) the principles of describing metaphorical terminology and the principle of identifying the initial reference unit, determining the metaphorical model in metaphorical terminology have been outlined. The metaphorical method for the formation of terms is studied by Sirotnina (2020).

Studies of various terms formed in a metonymic way have been presented in a number of articles with active polemics about the relationship between metonymy and word formation, notably in the studies of Janda (2011, 2014), Brdar and Brdar-Szabó (2014). The meanings of metonymic expressions in the banking terminology of the English language using a cognitive approach and a specially created corpus of the

terminology system for identifying metonyms have been investigated by Spirchagov (2019).

Some studies have focused on technical terms. Hence in the study by Nazar (2011), an algorithm and a model for the method of automatic identification of terminology has been developed. Likewise, considerable attention is paid to the terms of the field of education. The problem of linguistic representation of English and Russian academic terms in higher education has been considered by Kupriyanova (2013). The problem of terminology interference in professional communication in the context of the internationalization of higher education has been presented in the works of Deniko et al. (2015). The article by Khachatryan (2017) explores the semantic features of the group of English terms in the field of teaching a foreign language. Learning style terminology has been reviewed by Lake et al. (2017).

The review of the literature on the term formation has shown that research of such an actively developing sphere of English terms as e-learning thus far has been limited. Although there are some works in the field of virtual learning. For instance, Anohina (2005) has ordered and defined eight groups of the most common terms and relationships between the groups. Several articles address the issue of defining the multiple and confusing terminology associated with e-learning (Guri-Rosenblit, Gros, 2011), (Korucu, Alkan, 2011), (Moore et al., 2011). Bayne (2015) subjects the common term "technology-enhanced learning" to a deeper analysis. Having studied the terminology of social networks in the context of global communication, Albuquerque and Costa (2015) note the need for terminology management and define terminology as a sense-making social tool. Kumar Basak et al. (2018) have analyzed the definition, differences, fundamental perspectives, advantages, disadvantages, and finally, the similarities and differences of the terms e-learning, m-learning, and d-learning.

Meanwhile, the problem of studying the terms arising in modern English in the field of e-learning as one of the most dynamically developing elements of the global communication space seems to be of overarching importance. We suppose that semantic shift as a way of meaning specialization is a productive term formation mechanism and an active source of e-learning terminology replenishment, reveals the features of the terminology system formation and development. Furthermore, it outlines their word-formation trends in modern English and determines the specificity and consistency of the studied terminology.

Methodology

The research material is a corpus of 1600 English terminological units related to e-learning. Terminological units were selected by continuous sampling method from several types of sources:

- (1) scientific publications;
- (2) hypertext of educational sites, platforms, and other electronic resources;
- (3) lexicographic and terminographic sources (dictionaries and glossaries of terms).

The choice of the abovementioned sources as the main material is due to the fact that they reflect modern trends in the development of the language. At the same time, the popular science style is characterized by standardization of presentation and the use of regularly reproduced language means. The total number of sources for the selection of terms was 50 units.

Since e-learning is a relatively new phenomenon associated with the development of the Internet in the 1990s (Guri-Rosenblit, 2011) and it is a direct descendant of instructional technology and computer-assisted instruction (Larremendy-Joerns, Leinhardt, 2006), we consider logically justified the decision to limit the time period of the sources used for the selection of terminological units, from 2000 to the present day. Unconditional preference is given to the latest articles and other lexicographic sources, owing to the interest in new, hitherto unexplored examples of terms. Another

argument in favor of choosing recent publications is an implicit opportunity to illustrate the rate of new terms formation, as well as to compare the identified features with the results of previous studies, which will eventually allow determining current trends in the development of the studied terminology.

While compiling a database of examples, a continuous sampling method was adopted. More precisely, for the selection of relevant English e-learning terms following criteria were used.

- 1) Semantic criterion (the presence of any semantic feature common to the studied group of terms, expressed explicitly or implicitly in the definition of the term);
- 2) Contextual criterion (the presence of a thematic connection of the selected term with the studied area, identified as a result of the analysis of a sentence or text);
- 3) The idiomatic meaning of term combinations (the indivisibility of their meanings into the meanings of units isolated in their formal structure and thereafter irreducibility of the meaning of the whole to the meanings of parts in their given structural-semantic connection, which arises as a result of the loss of regular motivation of relations between the content plan and the expression plan of a linguistic unit due to rethinking of its constituent elements);
- 4) Reproducibility of terms in contexts (frequency).

The basis for the selection of a terminological unit for further analysis is compliance with one of the criteria.

As for the methodology, this study adopts (1) contextual analysis to extract key terms from text documents, guided by the criteria described above; (2) method for interpreting a dictionary definition to establish the meaning of a term; (3) etymological analysis to identify the main (primary) meaning of a lexical unit; (4) methods of differentiation and identification of terminological units in the sphere of e-learning, formed by metaphorization or metonymization and (5) quantitative and descriptive methods to present the selected material.

Analysis and Results

In the course of the analysis of the selected sources by the method of continuous sampling, 1600 terms related to the e-learning sphere were identified. Further analysis of the meaning of the terms and their definitions revealed that about one-third of the studied terms are formed in a semantic way. The study of the primary meaning of the terms, contextual and etymological analysis, made it possible to distinguish two groups of terms: terms formed as a result of metaphorical transfer, as well as terms formed as a result of a metonymic shift.

Metaphorical Shift

Speaking about the productivity of metaphorical shift as a way of meaning specialization, it should be noted that the nature and degree of metaphorical reinterpretation directly depend on the ratio of concrete and abstract vocabulary. Thus, among 1600 terminological units of e-learning and related areas that made up the corpus of the studied terminological vocabulary and selected from specialized texts and glossaries, metaphoric terms make up about 11%. These results are presented in Figure 1.

The share of terms - metaphors from the general selection

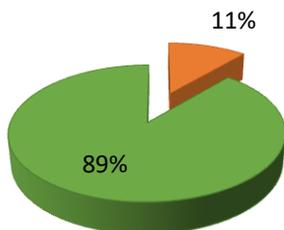


Figure 1: The share of terms - metaphors from the general selection

In the process of analyzing all terms - metaphors in the initial classification have been divided into two subgroups: single-word terms account for 13% of all terms - metaphors related to e-learning. The second subgroup at the remaining 87% of terms formed as a result of metaphorical shifts is compound terminological combinations. In this subgroup, two, three, and four-component terminological combinations are registered.

It should be noted that among the English e-learning terms - metaphors, there is a small number of single-word terminological units, for example, (1) *bridge*, (2) *cloud*. In the overwhelming majority of cases, the terminological units formed as a result of metaphorical shift are two-component terminological combinations of special words, as well as isolated cases of multi-component metaphorical terminological combinations. It should also be noted that these terms are formed not only by the semantic method of metaphorical reinterpreting yet by the interaction of the semantic and syntactic methods of term formation. This observation testifies to the need for secondary components in term combinations, in addition to the main component. The purpose of the minor components is to clarify, define and categorize the term in relation to the rest of the units.

Throughout the classification of compound terms - metaphors, according to the method of metaphorization, three subgroups have been distinguished. The first subgroup is made up of terms similar in their characteristics to the phraseological units of the general literary language. Compound terms of this type have the main feature of phraseological unity - the homonymy of the compound term and the free word combination of the general literary language. The basis of metaphorization is usually clear and visible. Compound terms of this type contain figuratively expressive connotations due to the perceptibility of the metaphorization process and the certainty of the shift signs. The following examples illustrate this subgroup of terms: (3) *turtle effect*, (4) *chalk talk*.

These terms consist of two components, and their meaning is lost if any component of these compound terms is deleted. By their origin, the terms are metaphors, as they are used in a figurative meaning, and this secondary meaning is based on a semantic shift that follows the principle of similarity. The inability to use these terminological combinations without one of the components, in view of the loss of meaning, indicates that this term is a phraseological fusion based on a metaphor.

As a result, the total number of compound terms - metaphors belonging to the first subgroup is 9% of all terms - metaphors, which is approximately 1% of the total number of English e-learning terms. This method of term formation turned out to be the least productive, which is confirmed by the quantitative result of the analysis. We assume that the small number of terms - metaphors such as phraseological unity

resulted from the lack of a long evolution of the word. The process of forming new meanings occurs in a short time and, when adapted, the word undergoes certain semantic transformations, which, in our opinion, are not sufficient to form phraseological unity, and then the term acquires other grammatical and lexical characteristics.

With regard to the second subgroup made up of terms where the metaphorical mechanism works through an attribute, which, in some way of word formation, indicates the similarity of the main, determined member of the phrase with the designated one. These are term combinations in which the noun being defined is formed in some semantic way, and the attribute is a metaphorized adjective. The following examples illustrate the mechanism of metaphorization in terms of this subgroup: (5) *back office*, (6) *digital life*.

Based on an analysis of available data proportion of English compound terms - metaphors related to the second subgroup (NOUN + METAPHORIZED ADJECTIVE) is 21% of all terms - metaphors which corresponds to 2.4% of the total number of studied English e-learning terms. The quantitative data obtained as a result of the analysis indicate that the model of the formation of English terms - metaphors in the field of e-learning is quite productive.

The third group of compound terms, formed in a semantic way of metaphorical reinterpreting, constitutes terminological units based on a metaphorized noun. This is the most common type of term combinations: a noun is the main grammatical term, and an adjective is an attribute. However, grammatical varieties of this type of term combinations are possible, metaphors in which two nouns are combined. An analysis of English e-learning terms selection showed that in the group of terminological constituent units, an example of the first type term combination (METAPHORIZED NOUN + ATTRIBUTE) would serve the following units: (7) *learning network*, (8) *programming tools*. Furthermore, the third group of metaphor terms includes phrases formed according to the model METAPHORIZED NOUN (base) + DEFINING NOUN. The following terminological combinations illustrate this model of metaphorical transfer of meaning: (9) *course thread*, (10) *course branch*.

It is important to consider a special type of terms - compound terms consisting of more than two words. Examples of multicomponent term combinations are the following units: (11) *Cloud Native Application Bundle*, (12) *round table conference*. These terms consist of four components, where the main member of a compound term is a metaphorized noun. The defining elements are adjectives, one of which is a metaphor in its origin, as well as a noun that serves to clarify, explain, and most often to form a specific term. The relatively small number of terms - metaphors consisting of four components indicates that, despite the complexity of the described objects, processes and phenomena of e-learning, the language's striving for brevity and consistency dominates the development trend of multicomponent term combinations.

The results of the analysis lead to the following conclusions. For the whole, the share of terms - metaphors is 11% (181 units out of 1600), which testifies to the significant productivity of this method of meaning specialization. The high prevalence of compound terms (two, three, and four-component terminological units) in comparison with single-word terms of metaphorical nature is explained by the need for secondary members, which is justified, firstly, by the complexity of the described concepts, moreover, by their function of differentiating generic terms and finally, by the specifics of the studied communicative sphere.

The next result of the analysis of English compound terms - metaphors in the field of e-learning, was the selection of the following subgroups according to the variety of metaphorization models. Thus, the least productive subgroup of terms - phraseological fusions (approximately 9% of all terms - metaphors). The semantic features of this group are similarity with phraseological units of the general literary

language, homonymy, obviousness of the metaphORIZATION basis, imagery, and expressiveness. The second subgroup with average productivity (amount to some 21% of all terms - metaphors) contains terms corresponding to the model NOUN (Base) + METAPHORIZED ATTRIBUTE. The third subgroup of English terms - metaphors with the highest productivity in the field of e-learning (more than 2/3 of all elicited terms - metaphors, 57%, respectively) corresponds to the model METAPHORIZED NOUN (Base) + ATTRIBUTE.

The results of the analysis of term types according to the mechanism of metaphorical shift and quantitative data are shown in Figure 2.

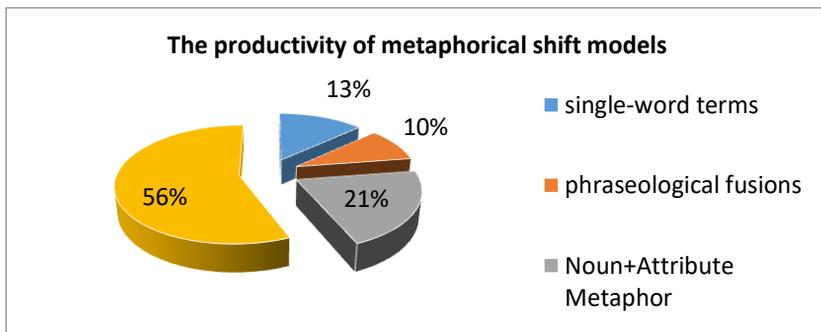


Figure 2: The productivity of metaphorical shift models

Metonymic Shift

The analysis of the material obtained as a result of the study made it possible to conclude that one of the semantic features of English term formation in e-learning is metonymy. The registered cases of metonymy of e-learning terms account for about 17% of all analyzed e-learning terms. Compared to metaphorical terms, they are closer to the core of terminology, which consists mainly of nouns with procedural meaning, denoting processes and elements, participants, and objects. The quantitative relationship of the selected terms - metonyms with the total number of analyzed terms is illustrated in Figure 3.

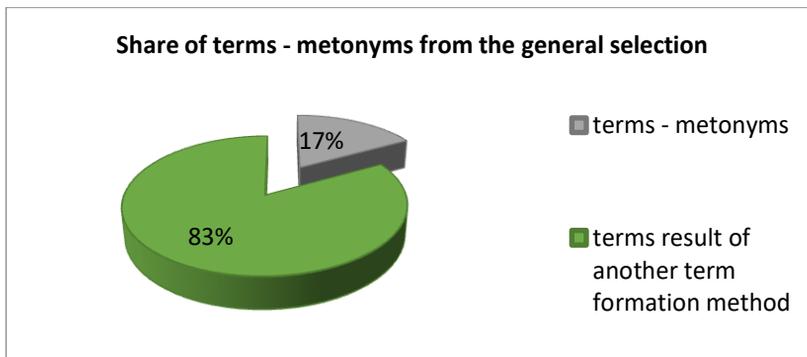


Figure 3: Share of terms - metonyms from the general selection

Single-word metonymic terms account for some 41%. The following terminological units will serve as an example: (1) *archiving*, (2) *digitize*. Compound terms are formed on the basis of the interaction between semantic and syntactic methods. The group of compound terms - metonyms makes up about 59%, respectively. In the abovementioned group, the majority of metonyms are two-component term

combinations (over 48%). For example (3) *audio conferencing*, (4) *course design*. Three-component word combinations make up about 8% of the total number of metonymic terms: (5) *virtual learning environment*, (6) *Digital learning*. The results of the classification of metonymic origin terms are presented in Figure 4.

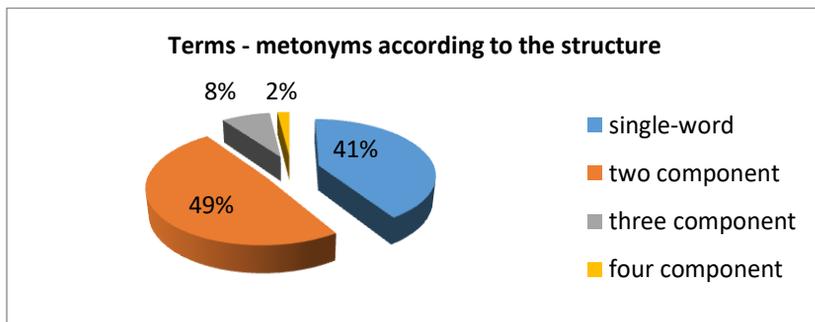


Figure 4: Terms - metonyms according to the structure

Analyzing the compound terms of a metonymic nature, several subgroups can be distinguished based on the structure of the term combination. In the first subgroup of terms, the defined component is the lexical unit of metonymic background, and the concordant attribute acts as the defining component: (7) *digital Immigrant*, (8) *digital native*.

Depending on the role of the attribute in the terminological combination, two types of compound metonymic terms can be distinguished.

1. The definition is involved in metonymic transfer. It does not simply express generic relations, but also performs a term-forming function. Metonymic meaning arises for the main word only in a compound term in combination with specific attributes: (9) *learning platform*, (10) *testing tools*.

2. The attribute is not involved in metonymic shift. The shift is carried out in a simple term - a word, and then its form is complicated by the addition of attributes expressing generic relations to it. This subgroup includes the following terms of a metonymic nature: (11) *screen recording*, (12) *social Computing*.

Hereinafter we consider the contiguity transfer models in e-learning terminology. The most productive model in English e-learning terminology is the transfer of meaning "from the name of the action to the name of the result." This model is illustrated with the following example: (13) *Connected classroom*. A metonymic shift from the action "to connect the classroom" (establish a network or connect computers to a network, provide communication) to the result of this action "connected classroom" - a classroom where the connection to the Internet has been established or a classroom where all class computers has been switched to a network (local or global).

The next productive model of the metonymic shift: "from an action to an element of the action, the element of a system": (14) *document reader*, (15) *file viewer*. The metonymic relations listed in examples (14) - (15) all formed according to the scheme, a shift from the action "to read the document", "to view the file" to the system elements such as "Document reader" "File viewer" as software element of a device.

The shift in the meaning "from general - to specific" is a special kind of metonymic relationship. Examples (16) *digital lesson*, (17) *web page*, depending on the context, can indicate the name of the technology (element or phenomenon) as a whole, or a specific object described in a specific situation, for example: "A web page is a set of data or information which is designed to be viewed as part of a website" (Collins

dictionary, 2020) "He constructed his own web pages devoted to teenage cancer" (Collins dictionary, 2020).

Also, the metonymic relations "from general to specific" are reversible, and a shift in the meaning "from specific to the general" is possible. An example of such a metonymic shift can be the following terms: (18) *antivirus*. This example illustrates a metonymic shift from the nomination of specific to the nomination of general. Thus term antivirus is used not only to fight computer viruses but certain types of threats. However, the specific term "antivirus" is used for a whole group of different security software modules and products.

Considering the relationship between general and specific, it is necessary to note a model similar to the type of metonymic shift, based on the relationship "whole and its part", which imply two options for transferring the name "from whole to a part of the whole" and "from part of the whole to the whole": (19) *face to face learning*. Hence "face" is a part of a person. In this term, it refers to a person as a human being participating in the learning process. Moreover, it can be both a student and a teacher. The following group of terms formed by metonymic transfer in accordance with the model "name of action - the object of action": (20) *To google*, (21) *to tweet*. Action metonyms describe the relationship between an action and the object of an action. Such terms metonyms are considered reversible. The following examples illustrate this model of metonymic shift.

To google - google

a. "from action to object" - to google the answer.

b. "from object to action" - to use Google to find the answer.

To tweet - a tweet

a. "from action to object" - to tweet a new subject.

b. "from object to action" - to post a new subject matter tweet.

There are considerably fewer cases of term formation with metonymic shift "from an object to the content": (22) *digital class*, (23) *digital classroom*. The terms metonyms (22) and (23) are the example of a situation where the name of the content shifts to the name of the object. The content of the "Digital class" is digital technologies used in the learning process. The content of the "Digital classroom" is a variety of digital equipment for the use of technology in education. This metonymic shift of the content to the object containing it is so natural that it makes these examples very difficult to differentiate and determine the presence of a metonymic shift.

It is also possible to note some cases of metonymic transfer, carried out according to models that are unproductive for the terminology under consideration: (24) "24/7" - Twenty-four hours a day, seven days a week, (25) *Twenty-first century learning*, (26) *One-to-one*. The peculiarity of the term (24) - metonym is the numeral that shifts the meaning. In example (25) we can observe a metonymic shift "from date to an abstract concept of modernity" with its specific characteristics such as globalization, progress, technological effectiveness, and competitiveness. Example (26) allows us to identify the relationship of "numeral and object". Also, this term has an earlier meaning, indicating an individual approach to learning. However, the principle of metonymic transfer remains the same. In the preceding meaning, the numeral one indicates a student and a teacher. Thus, we observe how the term receives a new meaning, formed on the basis of a previously functioning metonymic model. The shift happened without changing the form of the term, due to its application in a new, modern context. Presumably, the terms-metonyms formed on the basis of such basic associations for human consciousness, when placed in a new context, can adapt and acquire new meanings.

Figure 5 illustrates the quantitative ratio of the selected groups of terms - metonyms. This infographic clearly shows the productivity of certain types of metonymic shifts.

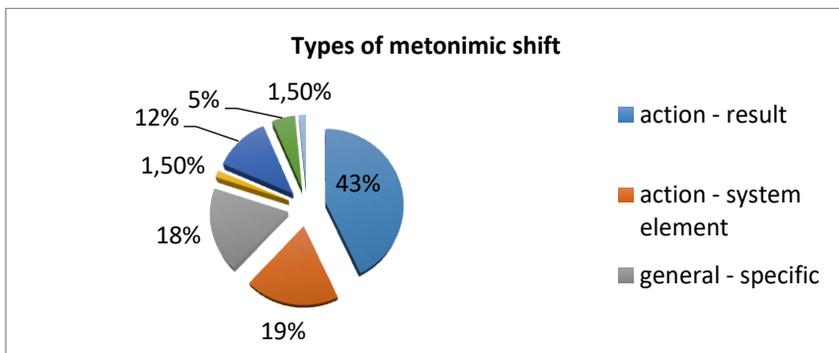


Figure 5: Types of metonymic shift

Throughout the analysis, based on the form of the terminological unit, the following groups of metonymic terms with different levels of productivity were identified: single-word metonymic terms (41%) and compound terms metonyms (59%). Furthermore, two, three, and four-component terminological combinations were registered among compound metonyms that formed as a result of the semantic and syntactic methods interaction, account for 48%, 15%, and 2%, respectively.

The metonymic shift model in English e-learning terms functions in two main ways:

- A. $\frac{\text{DEFINED COMPONENT}}{\text{UNIT OF METONYMIC NATURE}} + \frac{\text{DEFINING COMPONENT}}{\text{CONCORDANT ATTRIBUTE}}$
- B. $\frac{\text{DEFINED CPMONENT}}{\text{UNIT OF METONYMIC NATURE}} + \frac{\text{DEFINING COMPONENT}}{\text{INCONSISTENT ATTRIBUTE}}$

Based on the function of attributes in compound terms of a metonymic nature, two subgroups of term combinations have been distinguished. The first subgroup consists of term combinations formed on the basis of a simple word and a metonymic attribute, which function in a single unit, is term formation (a word can be both commonly used and already a term, but does not have signs of a metonymic shift in meaning). The second subgroup are term combinations formed on the basis of a metonymic term with an attribute, which function in a single unit, is to complicate, clarify and form a specific term from a generic term.

In a study of the metonymic shift models in English e-learning terms 7 subgroups that correspond to the following formation schemes have been identified (arranged in the order of productivity established during the analysis): 'actions - result' (43%), 'actions - a system element' (19%), 'general - specific' (18%), 'actions - object' (12%), 'object - content' (5%), 'numeral - object' (1.5%), 'whole - part' (1.5%).

The number of identified subgroups in relation to the quantity of terms corresponding to these subgroups indicates the variety of semantic processes occurring in the meanings of English e-learning terms and relations within term combinations, which we assume is due to the active development of the researched term system.

Discussion

Summing up the results of the analysis, first of all, we consider it is important to compare the results obtained in two main categories of semantic change as metaphorical and metonymic shift. Figure 6 illustrates the ratio of total number of analyzed e-learning terms, the number of terms formed as a result of the semantic change identified by the method of semantic analysis from the general selection, as well as the number of identified terms - metaphors and terms - metonyms.

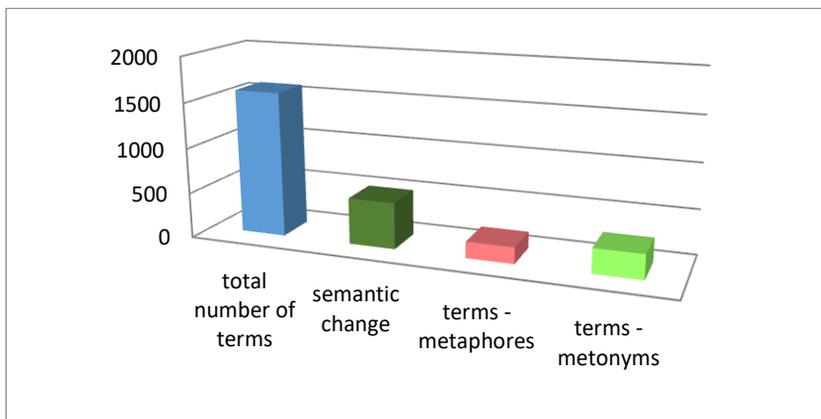


Figure 6: Number of analyzed e-learning terms

Comparison of the results obtained during the analysis gives reason to conclude that the specificity of the subject area has led to the predominant distribution in its terminology of semantic terms formed by metonymic shift, which is more prominent in terminologies with a predominantly abstract vocabulary. However, metaphorization is less active in the formation of e-learning terms. Most of the metaphorical terms are located on the periphery of terminology and do not differ in pronounced imagery and expressiveness due to the fact that many of them, as a result of intersystem borrowing, are widely known and used in many terminological systems, not only in English but also in other languages.

Thus, contrasting the findings achieved in the current e-learning terms research in from the semantic prospective with similar studies of terms in other professional areas, such as metaphors in the scientific (Morozova, Smolyanina, 2015) and technical language (Finatto, 2010), metaphoric terms of hydrotechnical term system (Shirokolobova, 2014), metaphorical fragment of the oil and gas terminological system (Deeva, 2014), metaphorical terms in the English tunneling terminology (Matveeva & Matveeva, 2017), metaphorical terms in biotechnology (Sirotina, 2020), semantics of legal terms (Kulevskaya, Dudik, 2016; Popova, 2018), etc., we find confirmation of the aforementioned idea that the nature and degree of metaphorization manifestation in different terminological systems are not the same. The mechanism of metaphorical term formation is very active in technical terminology and in other terminologies of the so-called natural sciences, while in the terminology of the humanities, other varieties of the semantic method are more active. The different productivity of metaphorization in terminological systems is explained by the difference in the ratio of concrete and abstract vocabulary.

Moreover, when comparing the outcomes of this study with works analyzing terms of a metonymic nature in various fields, namely in technical terminology (Beysembaeva & Zhusupova, 2019), medical terminology (Kreuzthaler, Schulz, 2012), (Lysanets, 2015), legal terminology (Rohach, 2017), terminology of pipeline transport (Gorokhova, 2014), metonymy in banking discourse (Spirchagov, 2019), geographical terms (Myzyn, 2015), etc., we can explain the activeness of such a mechanism of meaning specialization as a metonymic shift in the field of English e-learning terms. Metonymic shift, in which the name of an object or phenomenon is transferred to another object or phenomenon based on the contiguity, as well as metaphorization are types of semantic word-formation. However, metonymy, in contrast to metaphor, reflects those real connections of the surrounding reality in which the denotations themselves are located and is a kind of implication connections. The metonymic transfer is more typical for terminologies with predominantly abstract vocabulary.

To conclude the discussion, we consider it is necessary to note that current work is focused on the study of English e-learning terminology in the semantics perspective, while the works we studied in this terminological area used exploratory study (Hamilton, 2000), mixed-method analysis, and survey (Moore et al., 2011), definitional analysis (Anohina, 2005), (Guri-Rosenblit, Gros, 2011), comparative analysis (Korucu, Alkan, 2011), (Kumar Basak et al., 2018), critical analysis, drawing on insights from critical posthumanism, science and technology studies (Bayne, 2015), explanatory research (Lake et al., 2017), case analysis and qualitative study (Alyahya, 2018) and other. Thus, for the first time, a large corpus of e-learning terms was selected from lexicographic and other sources, which were studied from the point of view of their semantics and as a result of the action of various mechanisms of meaning specialization.

Conclusion

This study explores the types of metaphorical and metonymic shifts as ways of meaning specialization in the case of English e-learning terms. According to the results of this research, our initial assumption that semantic change as a way of meaning specialization is a productive mechanism for the formation of new terms and an active source of e-learning terminology replenishment is correct and is confirmed by quantitative data obtained during the analysis. Among the reviewed e-learning terms, a third is formed in a semantic way, among which the share of terms that appeared as a result of the metaphorical shift is - 181 terminological units, representing some 11% of the total amount of material considered. In addition, 272 terms formed as a result of metonymic transfer have been identified, which accounts for 17% of the total number of terms related to e-learning.

On the one hand, the number of identified terms, formed as a result of a semantic shift in a metaphorical or metonymic way, indicates the importance of these semantic processes for the specialization of the meaning of terms in general. The revealed variety of models confirms the high activity of semantic processes in e-learning terminology. Moreover, the peculiarities of the meaning specialization analyzed in the course of the study allow us to make an assumption about the high potential for e-learning terminology development.

On the other hand, regarding the total number of terms studied, as well as, in the comparative context of metaphorical and metonymic shift, the lower activity of the first against the second is explained by the different ratio of the abstract and the concrete in the vocabulary of the technical and humanitarian spheres as a whole. A metaphorical rethinking is characterized by the perception of a physical object and, on the basis of emerging associations, the transfer of meaning to the object under consideration according to the principle of similarity. However, due to the peculiarity of the investigated communicative environment of e-learning, the dominant part of its components is not material, and therefore associations based on such physical categories as color, shape, size, etc. are not possible. The small number of categories for associative thinking limits the number of emerging images, which explains the low productivity of such a semantic shift as metaphorical rethinking.

Thus, the semantic shift as a way of meaning specialization reveals the peculiarities of the formation and development of the e-learning terminology system, and furthermore, allows to draw conclusions about the word-formation trends of modern English in general, and particularly e-learning terminology. The results of the study confirm that meaning specialization through the semantic mechanisms of metaphorical and metonymic shifts determine the specificity and consistency of the studied e-learning terminology.

The practical significance of the research consists in the possibility of applying the main provisions and materials of the current study in the development of e-learning-

related glossaries and courses specializing in information and communication technologies in education. Conclusions can be applied in the practice of teaching English for special purposes, in the training of specialists in the field of teaching. The results can also be used to teach a number of linguistic courses, in particular, lexicology, terminology, stylistics, semantics, etc. Another perspective to apply practical results of the research is in compiling teaching materials, creation of electronic textbooks, and drafting hypertext of educational sites and other electronic resources, as well as in developing the content of electronic educational courses interfaces. Further research in this area is certainly needed, yet our findings so far indicate that e-learning terminology is still in its process of development. In the future, it is planned to consider the functioning of e-learning terms and the adequacy of their use by participants in the educational process.

Research limitations

The study of special vocabulary, particularly in the period of intensive development of new educational technologies, science, and international contacts, is of great theoretical and practical importance. The theoretical significance of the research consists in expanding and refining the conceptual apparatus in the field of English e-learning terminology, their semantic analyses, and detailed description. The statement of the problem and the summarizing of the results achieved will enhance further study of terminology and its classifications. The outcomes of the analyses will contribute to the development of lexicography, terminology and form an idea of the trends and prospects for the special English vocabulary development in the field of e-learning in the near future based on the most productive term formation models and types of semantic shift.

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