

THE ROLE OF METAPHOR IN TERM FORMATION: A COMPARATIVE STUDY OF ENGLISH AND UZBEK

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ABSTRACT. This article addresses the role of metaphor in the formation and development of terms, bearing in mind its influence on the semantic structure of terms. The linguistic features of metaphorical comparison were compared and analyzed using the examples of term formation in the English and Uzbek languages. Based on the examples of terms formed by metaphor, common features and differences in their semantic structure were discussed. The findings presented in this article confirm that metaphor plays a significant role in the development of a terminology system, as it enriches the terminology system with new terms, names, and denotes concepts inherent in the subject of a particular field.

Keywords: metaphor, terminology, term formation, semantic shift, technical terms, comparative analysis, English language, Uzbek language.

ANNOTATSIYA. Mazkur maqolada metaforaning terminologiyaga kiritilishi va rivojlanishidagi muhim hamkorlik sifatidagi roli tahlil qilinadi. Metaforik transferning leksik-funksional va semantik motivatsiyasi, shuningdek, ingliz va o'zbek tillariga xos o'xshashliklar hamda farqlar alohida e'tiborga olingan. Metaforik tushimchalar mantiqiy tushunish imkonini beradi va buni ishonchli davom ettirish maqsadida unitizimli ravishda tadqiq etish lozim. Shu bilan birga, maqolada o'zbek va ingliz tillarida turli sohalarda vujudga kelgan metaforik tushimchalar berilgan. Umumiy maqsad metafora yordamida unitizimli ravishda shakllangan terminologiyalarning hozirgi holati, ularning semantik motivatsiyasi, shuningdek, tayyorgarlik va qo'llanish jarayonlarida necha barobir tushunuvchi sifatida ishtirok etishini aniqlashdir.

Kalit so'zlar: metafora, terminologiya, terminlarning hosil qilinishi, semantika, texnik terminlar, qiyosiy tahlil, ingliz tili, o'zbek tili.

АННОТАЦИЯ. В настоящей статье рассматривается роль метафоры в формировании и развитии терминов, а именно её роль в становлении терминологии. В работе проводится сравнительный анализ лексико-функциональных и семантических особенностей метафорического переноса в формировании терминов на английском и узбекском языках. На примере терминов, созданных с помощью метафоры, рассмотрены их семантическое формирование и мотивация, а также общие и отличительные черты этих

языков. Полученные в ходе исследования выводы показывают, что метафора играет важную роль в становлении терминологической системы, в частности обогащает систему терминов, обозначает новые понятия и способствует выражению знаний в специальных областях.

Ключевые слова: метафора, терминология, терминообразование, семантика, технические термины, сравнительный анализ, английский язык, узбекский язык.

1. Introduction

Terminology plays one of the most critical roles in the modern language and cognition. By creating and using terms, scientists identify, describe, and pass on knowledge about various concepts, objects, and processes peculiar to a given field. At the same time, the development of science and technology is a continuous process; hence, it leads to the appearance of new terms that denote novel entities. Some of the terms originate from existing lexical items through metaphorical transfer, which makes their comprehension and description useful for further investigation.

Although traditionally considered a literary device that serves mainly to create imagery, metaphors play a crucial role in conceptualization and verbalization of abstract ideas. According to Lakoff and Johnson (1980), “metaphors provide a conceptual framework allowing one to understand one domain of experience in terms of another, more familiar one.” Therefore, they can help organize and understand concepts associated with a certain sphere.

Metaphors are commonly used to identify and describe objects, processes, and phenomena in the target sphere with the help of concepts from a source sphere (Ghajoyan, 2016; Volanschi & Kübler, 2011).

For instance, such technical terms (TT) as computer mouse-kompyuter sichqonchasi, river mouth-daryo labi(og'zi), and arm of a machine-mashina qo'li(dastagi) derive their meaning from the source concepts of small animal, anatomical site, and a part of a machine, respectively. These names are determined by the similarity in shape, function, and position, respectively. Metaphors help to describe and distinguish various complicated entities by comparing them to familiar concepts; thus, they facilitate comprehension and communication in relation to these entities.

The analysis of metaphors used in terminology is essential to explore the mechanisms of terminology development. A number of researchers have devoted their studies to revealing the role of metaphor in the description of conceptual systems related to the target sphere (Ghajoyan, 2016; Volanschi & Kübler, 2011). The current research aims to investigate the role of metaphor in term formation in English and

Uzbek by means of the comparative analysis of the selected terms. The hypothesis states that metaphor plays a major role in the process of term formation in English and Uzbek because it assists in describing the concepts inherent to TT by employing existing lexical items from the source sphere.

To achieve this goal, the present study explores the ways of metaphor usage in terminology by comparing various terms formed on the basis of metaphors. The findings of the study contribute to an understanding of how terms denoting TT emerge through the application of metaphorical transfer.

2. Metaphor in Term Formation

Terms can originate from lexemes of various parts of speech that denote familiar entities of the source domain and help to identify and describe TT on the basis of similarities.

Ghajoyan (2016) sheds light on the phenomenon of metaphor usage in the field of TT formation. Similarly, Volanschi & Kübler (2011) explore the ways of metaphorical framing in the process of TT description. Both researchers show that conceptualization plays a crucial role in terminology development since it allows organizing concepts and naming TT according to their peculiarities and specific nature.

3. Research Methodology

The current study focuses on the analysis of metaphor-based term formation in the English language. To achieve this goal, 25 terms were selected and grouped on the basis of the similarities described by shape-based, function-based, position-based and behaviour-based metaphors. To be specific, the terms of computer, geography, mechanical engineering, and scientific terminology were reviewed to identify the common and peculiar patterns of term formation on the basis of metaphorical transfer. Each of the selected terms was examined with the following criteria in mind:

1. The common literal meaning of the lexical items used to form the term.
2. The specialized meaning peculiar to the term in question.
3. The similarities on the basis of which the term was formed.

The methodology proposed by Lakoff and Johnson (1980) as well as the findings obtained by Ghajoyan (2016) and Volanschi & Kübler (2011) provide the theoretical background for this study.

This research employs a qualitative-descriptive methodology, which means that it uses primarily descriptive data to examine the patterns of metaphor-based TT formation. The examples used for the analysis represent a particular trend in TT formation, not a statistically significant amount of data. This study does not claim to provide a comprehensive understanding of TT formation in general or the influence of metaphors on term formation in particular.

4. Analysis and Discussion

4.1. Shape-Based Metaphor

The terms of computer mouse-kompyuter sichqonchasi and butterfly rash-kapalaksimon toshma originate from shape-based metaphor. The names of IT-related TT seem to have been coined mainly on the basis of their resemblance to certain objects of the source domain. Computer mouse refers to a computer peripheral device used to move the cursor on the computer display; the name of this TT comes from the word mouse, which denotes a small rodent with tail. The similarity in the shape of the object from the source domain and the term from the target domain is the reason for the metaphorical transfer. In Uzbek, the equivalent term of computer mouse is the same as in English, which demonstrates that the patterns of metaphor usage, in particular shape-based metaphor, are similar for these languages.

Butterfly rash indicates a skin condition, the visual appearance of which resembles the wings of a butterfly. The TT butterfly rash is the result of a shape-based metaphor referring to the similarity of the rash shape and butterfly wings. According to the Uzbek equivalent of this term kapalaksimon toshma, this rash is also compared to a butterfly, which makes it possible to suggest that the visual similarity played a significant role in the formation of this TT.

The TT black hole (the space region within which nothing, including light, escapes) has the equivalent term of qora tuynuk in Uzbek, which also refers to a hole or an opening. Hence, the source concepts of this TT, just like the terms mentioned above, bear a strong resemblance to the target concept. As can be seen from the analysis, the terms formed on the basis of shape-based metaphors allow describing target concepts with the help of source concepts on the basis of their visual similarity.

Shape-based metaphors also apply to anatomical TT, such as river mouth/daryo labi(og'zi). River mouth denotes the part of a river that flows into another water body, and this TT was formed on the basis of the anatomical term mouth.

Another TT that has been formed on the basis of the source concepts of the human anatomy is arm of a machine (mashina qo'li(dastagi)). This term refers to the mechanical manipulator, which helps position the various parts of a machine; as such, the term arm of a machine was coined on the basis of the body part arm. Thus, the comparison of TT and their equivalents in Uzbek reveals particular patterns of metaphor usage, which help distinguish and describe terms referring to target concepts.

Other examples of Shape-Based Metaphors in English and Uzbek:

		A tree consisting of a	, shajara	A hierarchical data structure	The arrangement of nodes resembles
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		trunk and branches.		consisting of interconnected nodes.	the branching structure of a tree.
		A star represented by a central point with rays extending outward.		A network configuration in which devices connect to a central node.	The central node and its connections resemble the radial arrangement of a star.
		The small opening in a sewing needle through which thread passes.	Igna ko'zi	The opening of a needle used for threading.	The small opening is metaphorically referred to as an "eye," based on a perceived resemblance to an eye or eye-like opening.
		A wall is a structure that encloses or separates an area.		A rigid outer layer that surrounds certain cells and provides structural support and protection.	The cell's outer layer performs a boundary-forming role similar to that of a physical wall.
		A worm is a long, soft-bodied animal.	Chervyakli uzatma yoki chervyakli tishli g'ildirak	A gear mechanism consisting of a screw-like component that meshes with a toothed wheel.	The elongated, worm-like appearance of the screw component motivates the term.

Among the given terms, the tree structure is commonly used in English computer science to describe hierarchical data organization; however, in Uzbek, the image of a tree is often associated with a family tree (oila shajarasi). Likewise, the term needle eye is used metaphorically in English; however, in Uzbek, it is common to use igna teshigi ("needle hole") as a direct descriptive expression. These are examples of differences in metaphorical naming in terms of the two languages.

4.2. Function-Based and Spatial Metaphor

The TT robotic arm (robot qo'li) and computer gateway (tarmoq shlyuzi) demonstrate how the terms of mechanical engineering and computer science borrow the concepts from human anatomy and the field of transport, respectively. Robotic arm denotes the manipulator of a robot, and it was formed on the basis of the human arm

because of the similarity in their functions. Robotic arm and human arm allow achieve the same goal, which involves reaching for and grasping an object.

The TT computer gateway refers to a computer hardware device or software application that links networks together and controls information exchanged between these networks. According to the computer science terminology, this TT originates from the term gateway, which is a security barrier at the entrance to a particular location. Similar to other TT mentioned in this paper, robotic arm and computer gateway were formed on the basis of an image referring to an entity from the source domain because of the similarities in function, in particular spatial relationships. The function-based metaphor played a significant role in the formation of this TT.

Another example of spatial TT is genetic blueprint/genetik reja, where the source concept of construction helps to conceptualize the abstract TT genetic blueprint.

The TT heart valve /yurak klapani denotes the flap-like structure in the heart that permits the unidirectional flow of blood and allows the heart to function properly. Similarly to robotic arm, heart valve is the TT that was formed on the basis of the function of the human arm. According to this TT, the function of a heart valve is similar to the mechanism of the machine or device that regulates the flow of the fluid or gas. The function-based metaphor also applies to the TT computer virus/kompyuter virusi, which denotes malevolent computer code that typically replicates itself and invades other computer files after entering one, similar to biological viruses. It can be argued that computer virus was formed on the basis of the function of a virus as an infectious agent.

4.3. Position-Based Metaphor

The TT desktop/sh stoli and web page /veb-sahifa are the examples of terms that were formed on the basis of position-based metaphor. Desktop refers to a windowing environment in a computer operating system, while the word desktop was formed on the basis of the familiar interior item desk. Desktop, similarly to other TT mentioned in this paper, was coined on the basis of the visual similarity of the items from the source and target domains.

Web page denotes a document on the World Wide Web that usually contains text, images, and multimedia elements, and the term web page originates from the word page, which denotes a sheet of printed or written material. The visual similarity of the concepts can be explained by the location of the objects: in particular, web page as the document on the computer screen was compared to page as the piece of paper used for writing. According to the Uzbek equivalent of the terms desktop and web page, ish stoli and veb-sahifa, respectively, the visual similarity in terms of the position of these items on the surface of the desk was taken into account as the basis for term formation.

4.4. Behaviour-Based Metaphor

The TT computer virus (kompyuter virusi) and search engine (qidiruv tizimi) demonstrate how the terms of computer science borrow the source concepts from biology and mechanics on the basis of certain similarities in behaviour and function. The TT computer virus refers to the malicious programme, which, similar to biologically existing virus, invades the computer file and attacks it from the inside. Computer virus as the malicious programme has a clear equivalent in Uzbek language named kompyuter virusi, which shares the image of virus invading the body.

By contrast, the TT search engine/ qidiruv tizimi denotes the software application of a computer that searches information in the Internet, but this term has no direct equivalent in Uzbek language. The reason for it may be the fact that search engine originates from the concept of an engine, which refers to the machine that provides the power to another machine or vehicle. It can be argued that the image of an engine that powers another machine was borrowed to denote the computer programme that enables searching information on the Internet.

Other examples:

	Rasmiy kelishuv	Devices exchange signals to establish communication, resembling a greeting.
		A timer monitors system activity, resembling a watchdog.
	Veb-sahifalarni avtomatik ko'rib chiqish	A program navigates web pages, resembling crawling.
		Malicious software spreads and affects systems like a biological virus.

5. Metaphor in Scientific Terminology

It has already been mentioned that metaphor plays an essential role in terminology, in particular the scientific terminology. Volanschi & Kübler (2011) explore the ways of biological TT conceptualization and demonstrate that conceptualization helps to reveal the patterns of metaphorical usage, which, in turn, help form the TT and identify the structure of terms referring to them. Scientific terms are commonly conceptualized with reference to familiar entities, bodies, phenomena, and actions because they allow name the TT that are not familiar.

Conceptualization of TT with reference to these entities, in particular, leads to the emergence of metaphorical terms that help establish associations between the concepts of source and target domains. The study of such terms enables recognizing their semantic structure, which, in turn, becomes crucial to identifying the similarities

between two or more languages. Thus, the analysis of metaphorical TT allows investigate the common patterns of terminology on the basis of the usage of conceptualization and metaphor.

5.1. The Main Conceptual Patterns

The examples provided in this paper demonstrate that there are several conceptual patterns of term formation on the basis of metaphor. The first pattern refers to the conceptualization of TT on the basis of the entities of human anatomy and body parts. This pattern accounts for the majority of terms described in this paper: body parts and anatomical site such as head, mouth, and arm account for the formation of TT arm of a machine, river mouth, and robotic arm, respectively. These TT were formed on the basis of visual and functional similarities in particular. The second conceptual pattern describes the formation of TT on the basis of the concepts of familiar entities and objects, such as small animal, that share some similarities with TT. Such TT as computer mouse and its Uzbek equivalent kompyuter sichqonchasi demonstrate this pattern of conceptualization of TT. The third conceptual pattern accounts for the conceptualization of TT with reference to entities of various domains that denote familiar concepts. This pattern includes the TT of the computer science, biology, astronomy, and other domains. The examples presented demonstrate that the formation of those TT is based on the similarities in terms of visual appearance, function, and behaviour in particular.

On the basis of the provided discussion, it can be concluded that each pattern of term formation determines the ways of TT conceptualization and description. In particular, the similarity between TT and the entities of source domain determines the pattern of term formation. Moreover, this study shows that these patterns, particularly the conceptualization of TT on the basis of human anatomy and objects of the daily life, are similar for different languages. On the basis of the analysis of these patterns and patterns of metaphor usage in terminology, the comparative analysis of metaphorical concepts in English and Uzbek languages can be carried out, allowing identify the ways the terms are formed in these languages.

6. Conclusion

The current study explored the role of metaphor in technical term formation by comparing the examples of TT of English and Uzbek languages. The findings demonstrate that metaphor plays a considerable role in TT formation because it enables create the terms that describe and conceptualize target TT on the basis of source TT. With this goal, various conceptual patterns of TT formation were explored on the basis of the comparison of English and Uzbek terms. The findings demonstrate that the source TT can denote concepts of human anatomy, familiar objects, and various entities

of other domains. Thus, the analysis of the conceptual patterns and similarities between terms of different languages can provide a better understanding of how terms in these languages are formed.

The English-Uzbek comparison also highlighted similarities and differences in metaphorical transfer between the languages. In certain cases, the metaphorical images were identical, as could be seen in computer mouse and kompyuter sichqonchasi, black hole and qora tuynuk. In other instances, the Uzbek counterpart of the English source term only partially retained the figurative meaning, replacing it with a descriptive or conventional technical message. This suggests that for comparable concepts, the target language may possess different metaphorical images that are used only partially and conditionally to convey the specialized meaning.

The present study therefore concludes that metaphor needs to be considered both as a process of naming and as a way of conceptualizing specializations of knowledge. Its classification as a process depends on the context in which it occurs and the basis of comparison, since the same linguistic element can involve multiple metaphors based on different sources of similarity.

It is also necessary to note that due to the limited set of examples, the current research only provides a partial illustration of the processes taking place. Subsequent studies may build upon the findings of this paper by expanding the pool of terms that require description and analysis. The comparison of different lists of English and Uzbek terms and the identification of conventional equivalents using corpora and special dictionaries can provide more information about the nature of metaphorical description and help establish its conventionality. This will enable further research into the phenomenon of metaphorical term formation and its implications for comparative terminology, translation, and lexical specialization of the languages under study.

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