

Section 4. Linguistics

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REVIVING WITHERED IMAGE (METAPHOR AS A MEANS OF COGNITIVE VISUALIZATION IN EDUCATIONAL TECHNIQUES)

Abstract: The use of a metaphoric transfer as a means of visualization is analyzed in the field of English for specific purposes (ESP) teaching and learning process. Internal and external visualization has been considered as an educational technique of shipbuilding terminology acquisition in the process of mastering occupational communication competences. The main approaches were observed on the basis of the Joint Sino-Ukrainian Educational Project implementation on the platforms of the Zhejiang International Maritime College (China) and the National University of Shipbuilding (Ukraine). All theoretical statements of metaphoric transfer are accompanied by practical examples from ESP studies in the environment of Chinese and Ukrainian students study process. Special emphasis has been attended to the techniques of visualization in the field of term forming, their identification, retention and explication. They are orientation metaphors, identification of forms and shapes, terms created in result of somatic lexis transfer, classification systems generation.

Keywords: educational technique, ESP, metaphoric transfer, retention, explication, somatism, terminology acquisition, visualization.

Introduction

The notion of a metaphor, in its quotidian use, implies an allegorical character of its function, an ability to transfer the names of notions or features of certain notions, to other ones on the basis of their similarity or, sometimes, contrast. This stylistic figure has been conventionally understood as a central trope of poetics or literary figurative style since Aristotle.

The potential of metaphorical transfer formations in poetry and fiction is endless, whereas the

endurance of its manifestation in the realm of artistic image creation is not so eternal. The fiction history witnessed and abundance of cases when the charm of a once original, fresh and strikingly bright meaning, its visual, audial or kinesthetic feelings, born as a result of a transfer, gradually grew dim, obliterated or utterly erased from imaginative memory paradigms due to its frequent use. For the moment, let us note a particularly simple examples: ‘water current’ or ‘water flow’ for describing time,

'utterance of waves' as a dynamic audial image of repeated sounds of waves falling on the shore, 'ship of the desert' instead of 'a camel', 'head' in the sense of being a leader of a group or an organization, 'green-eyed monster', – a visual image coined by Shakespeare for 'jealousy'.

A live language metaphor, unlike a poetic one, is never subject to such a 'deadly oblivion'. Quite recently the results and technique of a metaphor's simile formation have become the focus of cognitivism owing to an unexpected illumination of its constant participation in the development of language and speech, preservation of old and creation of new matrices or archetypes of the human thought, first indicated by Lakoff, G. and Johnson M. [1, 2].

We have deliberately saturated this introductory passage of the synopsis with the fertile substrate of imagination-appealing lexis to pay homage to the metaphor service for the human artistic conscience and contrast it with a more clear-cut style of a research. This contrast is believed to contribute the transition to the second, more profound interpretation of a metaphor as a specific form of cognitive thought and demonstrate its educational role in ESP teaching and learning. It is this function of a metaphor that was factored out into the article heading.

The objective of our research is a demonstration of a non-traditional use of visualization as a form of the metaphoric transfer of notions in the process of ESP teaching and learning. This objective anticipates the consecutive solution of a number of minor practical tasks that faced us while seeking improvement factors within the educational environment of Chinese and Ukrainian students participating in the Joint Sino-Ukrainian Project implementation on the platforms of Zhejiang International Maritime College (China) and the National University of Shipbuilding (Ukraine).

Some of the stages of the project observation and development were described earlier [3–5]. Here we are making an attempt of substantiating a new approach to the application of a metaphor as an instru-

ment of the educational cognitive technique aimed at the improvement of mastering ESP competences in the shipbuilding and marine power engineering terminology acquisition. During the analysis of terminological word usage we'll consider those metaphors that are strongly drawn to the so called epiphor i.e. habitual, even worn out ones in contrast to those that are inherent in fiction. And it is teaching terminology in the process of acquisition of professional English that is the reason of such approach in our research.

The rationale of the new consideration of a metaphor's use as an instrument of cognitive process was disclosed in a well-known works of Lakoff, G. and Johnson M. indicated above and later developed by an American psychologist Jerome Seymour Bruner [6], Dutch cognitivist Ankersmit [7], Russian philosopher Kedrov K. [8] and others.

Without going into detail, the principal concept of a metaphor of the above authors is that "most of our ordinary conceptual system is metaphorical in nature" [1–9] and that metaphors, being linguistic expressions, reflect the human conceptual system [1–10]. Since a metaphor has been already recognized as one of the most important instrument of verbalizing both our inner thoughts, and the outer world, we can make an assumption that it could be also an important instrument of the educational process.

Generally speaking, learning a foreign language is essentially a process of constant metaphorization – a permanent transfer, identification and retention in the course of reciprocal interaction between the two language systems of verbalization, – the source language (a mother tongue) and the target one (a foreign language). Investigation of this process comprises uncountable revelations in the field of educational technique application in the course of ESP teaching and learning.

Referring to the process of terminology forming as a metaphorical transfer in one language system only, we can add one more element to this chain of study stages: explication of notions as an element of ESP educational technique. It concerns the case

of identification of nearly complete (both inner and outer) visual image loss of a formerly 'live' term. There is a set name for this phenomenon in applied linguistics – polysemy disambiguation. For example, Panamax has become a set name for the ship's type which can pass through the Panama canal. This ship's type appeared due to the reconstruction of the canal. The result of restrictions imposed by Classification Societies the maximum beam of the largest vessel was defined in view of the new width of the canal. Very soon, in line with this word-building model, a number of new types of vessels emerged: Rivermax, Suezmax, Capesize, and other container ships and oil tankers. This row included Aframax type. It was often misunderstood and identified as a vessel satisfying restrictions of sailing in the vicinity of African shores. But the explication of the abbreviation helps to eliminate this ambiguity: Aframax is a type of tankers relating to LR2 class along with AFRA Classification (Average Freight Rate Assessment). And this is only one of many examples when an explication of meaning, which often goes along the reverse path of a metaphor transfer, i.e. backwards from the sign to the image, provides an efficient restoration technique for ESP terminology acquisition.

Descending by "the steps" of the language structure, defined by F.de Saussure [9], with its intrinsic interconnections between the signifier and the signified, we have undertaken an attempt to specify our study to the role of the visualization as a means of cognition. The next stage was to instantiate our argu-

ments with the examples from authentic materials for acquiring ESP competences in shipbuilding.

Let us start with the analysis of the whole phenomenon of metaphorical transfer as the reason and the result of inner and outer visualisation in greater detail, starting from fundamental cognitive process description, 'solidification' of the image name in the set terminological unit, its retention as an element of a language systemic pattern. And, in the reverse direction – from classification schemes of a terminology system or its fragment, through the analyses on different levels, to the final explication as a means of description and understanding in educational process.

Structurally, we have divided the material into four meaningful subtitles: visualization as a cognitive process and practical examples of its use in visualizing general and branch terms; use of somatisms in shipbuilding terminology system acquisition; cognitive and educational role of terminology system classification.

1. Visualization as a cognitive process

Visualization as a significant, if not the most fundamental technique for terminology acquisition, is also metaphorical in its character. Most newly devised words, being metaphoric derivatives from fundamental signifiers, entered general and specialized terminological fields due to the science and technology development. They were formed, solidified and, finally, identified in result of an image transition to an object, process or action.

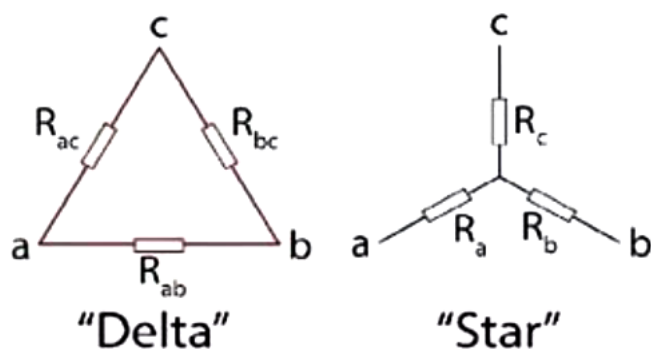


Figure 1. Principal schemes of Delta and Star connection

Let us disclose this process by the vivid example from the history of electrical engineering. When an electrical engineer Dolivo-Dobrovolski, who was the first to suggest the idea of a three-phase current application, had to solve the problem of connecting 3-phase generator windings, he performed it in two ways. One of the connections bore the resemblance with a triangle, and another one with a star. The result of this inner visualization was a metaphoric transfer of the two well-known geometrical figures into the images that corresponded to their contours. Then he depicted them on the paper schematically and assigned the names of 'a triangle' and 'a star'. Further on these connection nominations started their 'terminological life' and entered the majority of languages. In the language of the author (Russian), the name of a 'triangle' connection till now co-exists with the name of a 'Delta' type, accepted in most West European languages, as the upper-case Greek letter Δ is a perfect isosceles triangle but much more compact and vivid in its form. The second name has been preserved in the original or literal translation in all modern languages, though it does not bear as perfect resemblance (it is essentially a three-point figure in contrast to more conventional pentagonal, six- or seven-point stars) as the delta or the triangle. For us the most important fact is that these two images were generalized due to their nomination by well-known figures. In other words, the integrating act has been created between the inner image and its semantic presentation. It also helped greatly a convenient and fast way of information reference to these types of connections for their easy generalization and retention (memorization). (It is worth mentioning that in modern Greek the notion of metaphor still retained its first literal meaning: "Μεταφορικό ανταλλακτικά" – agency (or service) of delivery. The signboards bearing these word combinations can be often come across today in business districts of Greek cities and ports).

If we implement these educational techniques as a two way process: demonstrate the process of cre-

ation of this holistic picture of the knowledge fragment, on one side, and on the other – present these two types of connection in the drawing, photo, principal scheme, the end-process of its acquisition will be most complete and profound. Separate use of inner and outer visualization can be also implemented but the resulting efficacy of systemic (two-directional) approach that will surely exceed *apriori* expectations. And it has been confirmed by the results of the students' tests aimed at terminology mastering check-up in the process of ESP teaching within the frames of Sino-Ukrainian project indicated above.

2. Practical examples of visualization of general science and branch terms

Here are the most vivid examples of terminological system of general science and technology, that are widely used in shipbuilding and marine power engineering fields, as well as those inherent in a more specialized terminological groups. The first of them deals with the orientation 'metaphors'.

In line with Lakoff, who described one of the main types of metaphors as orientational, we understand their important role in describing various ship's parts, their position in relation to one another bearing in mind contrapositions of top or upper (*tank top, topsail, topmast, topline, top light, upper deck*) in contrast to bottom or lower (*bottom beam, bottom bracing, bottom board, bottom clearance, double bottom, bottom of tank, bottom valve, lower deck, lower hull top*), the front (*afore, forebody, fore end*) in contrast to the rear direction (*abaft, aft, after body, afterpeak, aftermast*), which is multiple in sailing ships where crew members still work by hands (cf. marine command *all hands aboard*), and looses its power of word coinage and word-building with the reduction of synergetic effect in larger structures.

Spatial orientation still remains highly applicable in such shipbuilding disciplines as ship's design, structural mechanics of ships, technology of shipbuilding, in description of dynamic and static stresses and strains, hull's elements and their interconnections, etc.

The importance of identifying forms and shapes can't be overestimated in ESP, especially concerning design and structural engineering where it is very important to identify shapes. The most common ways of describing figures, bodies and shapes are the following visualizing techniques:

1) By using the names of two- and three-dimensional figures, e.g.

– The *cylindrical body* (圆柱体) of the ship's hull was plotted with the help of the SolidWorks2010 software;

– The bow of a ship is shaped like a *triangle* (三角形). It is *triangular* in shape.

2) The second way of describing shapes can be carried out by using the letters of the Greek and Latin alphabets:

- a *V-notch* (V型缺口);
- a *W-shackle* (W型卸扣);
- an *S-shape tube* (S型管道);
- an *H-girder* (H型梁);
- an *I-girder* (I型梁);
- a *T-piece* (T型件);
- an *L-bar* (L型板).

It happens frequently when it is difficult to find Cyrillic, Greek or Latin alphabet equivalent, we can use an advantage of a graphic simile, like “a *bath-type curve*” (槽型曲线), etc.

3) We often refer to the components of structural units through association with widely-known shapes that call forth a vivid allusion:

- a *herring-bone gear* – (人字齿轮);
- a *needle plug* – (针塞);
- a *spider web aerial* – (蜘蛛网天线);
- a *basket-handle arch* – (三心拱);
- a *delta-connection* – (三角接口);
- a *star-connection* – (星型接口);
- a *dog-bone bar* (стержень галтельной формы in Russian) – (狗骨棒);
- a *horseshoe piece* (подковообразная деталь in Russian) – (马蹄铁);
- a *herring-bone gear* (шевронная передача from chevron stripe on a uniform) – (鲱鱼骨齿轮);

– a *dove-tail joint* (ласточкин хвост in Russian literally a swallow-tail) – (鸽子尾接头);

– a *gooseneck support* (опора S-образной формы in Russian) – (鹅颈头支架).

As seen above, the last five are somatisms, i.e. terms formed from an allusion to body parts of animals, birds and fish.

3. Role of Somatisms In Shipbuilding Terminological System

Manifestation of metaphor involvement in terminological system of shipbuilding can be easily demonstrated by the multiple use of somatisms as the source of term forming which is proved by an extremely productive word-building process in the field.

In general English, as contrasted to ESP, the highest productivity of somatisms is observed in the sphere of the wordbuilding where the most active parts of a human body are used. They are, on one side, ‘a head’ with its constituents, like ‘eyes’, ‘nose’, ‘mouth’, ‘ears’. But, on the other, they are limbs or extremities, i.e. ‘hands’ (‘arms’) and ‘legs’ (‘feet’). However, having analysed the usage of somatisms as metaphors in the field of engineering terminology in general, and shipbuilding, in particular, we have come to the conclusion that the most frequent somatisms indicated above, do not prove to be as much productive in naval architecture as in everyday speech manifestations. The reason for this divergence can be explained by the fact that ships are huge structures which elements constitute the largest objects ever made by man. Ships’ components are of much greater size than other items or structures a human being is surrounded by. They are located too distantly from one another, cannot be often ‘observed’ closely or ‘touched’ directly in result of ergonomic interaction between a man and objects around him. But the first image of a ship in the learner’s mind is formed with a widely-used metaphor of the ship’s hull as a floating *body* consisting of a *backbone* (keel) with *ribs* (framing system), *sides* (boards) and *bottom* that are covered with the *skin* (casing).

Therefore, the somatisms that are used more frequently in shipbuilding, are 'obliged' by their origin and existence in the terminological nucleus to the combination of their functional use and visualized simile. *Nose*, as something protruding forward more than the other parts of the head, is inferior by frequency occurrence, than such important elements of structural mechanics as *a bracket* or *a knee* in the terminological system of naval architecture. The same concerns *a heel*, as the main functional part of support, which occurs more frequently in the maritime terminology than *a foot* or *a leg*. Nevertheless the latter terms reveal themselves as often in other fields of technology.

There are conventional approaches to the analyses of somatisms in modern linguistics. For instance, examination of somatisms possessing interlingual equivalence or, vice versa, explaining the differences of somatic transference among the languages. But our aim here is more humble and restricted to the substantiation of the significance of these cognitivist phenomenon applications in ESP learning due to its visual character. And this importance can be also grounded by the essential amount of terms derived

through an easily visualized character of their manifestation in the vocabulary of shipbuilding.

We have analysed 17 technical, maritime and shipbuilding dictionaries and a number of authentic literature sources. Due to the excessive amount of the material to be analysed in the restricted size of the journal article, it was decided to preserve the collected corpus of somatic terms and their equivalents in the form of an English-Russian-Ukrainian vocabulary on the college website for a few reasons. Firstly, in order not to overload the article synopsis with auxiliary materials. Secondly, to preserve a probative value of our arguments. And, finally to ensure an open access to the collected materials [2] of other enthusiasts of somatic terminology studies. Moreover, the number of such terms in shipbuilding literature *per se* (over 570 terminological units) is a sufficient argument in favour of their inclusion into the arsenal of educational material aimed at improvement of ESP [2] URL: <http://gjy.zimc.cn/info/1085/1231.htm> teaching. Herewith is an excerpt from the list of selected terminological units concerning only one somatism, – a cheek, – in English, Russian, Ukrainian and Chinese.

Table 1. Somatic terms excerpt from the corpus list of shipbuilding literature

English	Russian	Ukrainian	Chinese
chafing cheeks	киповая планка	кипова планка	防擦板
cheek plate	чикса	чикса	颊板
cheekpiece	боковое ребро жесткости	бокове ребро жорскості	托腮板
drum cheek	щека вьюшки	щока в'юшки	鼓颊板
mast cheek	оковка мачты	оковування щогли	桅底颊板
rowlock cheek	боковая стойка врезной уключины	бокова стойка врзного кочета	桨门承板
snatch cheek	откидная щека	відкидна щока	扣盖

The next logical step of an ESP practitioner is to devise brief and compact educational techniques of reviving the withered visual image for its associative retention and efficient acquisition by the students and further use in their professional activity.

4. Classification as a cognitive instrument and means of terminology acquisition

Two-, three- or more word combinations often represent a term that is based on a basic notion of one of the words. Since the systems of notions are structured within a terminological system, we can

assume that the majority of terminological word combinations are perceived as parts of other notions. It brings us to the assumption that primarily primitive human societies verbalized the outer world and structured it as a system of notions connected with each other in a naive way. It also provided an easier retention of a complicated vision of the world in the early human conscience. Secondly, it discloses the cognitive function in the process of terminological system formation from epistemological point of view. Thus, a metaphor participates actively in image creation processes. They are reflected in abstracting from inessential features, properties or connections of an object or phenomenon aimed at specifying their significant and regular attributes. We are all aware of the utmost significance of this universal approach to all spheres of teaching, explanation and clarification used for establishing interconnections among objects, their similarities and differences for creation of generic concepts. Various classification system generation is one of the general methods of scientific cognition and also an important way of general notion transition into a terminological one.

Various classification schemes generation based on different logical bases, such as sub-assumption relations, 'the piece and the whole' relations, relations by adjacency, relations by association, etc., and their role in acquisition of ESP terminology has been demonstrated in our earlier works referred to above. Herewith, classification generation process is of essential conceptual significance of visualization as another justification for the wide application of this cognitive aspect in competence acquisition.

Drawing principal schemes is an invaluable educational visualizing technique at first stages of presentation in ESP teaching. Actually it is a kind of simplifying detailed schemes for the advantage of demonstrating generalized principles of intrinsic and complicated mechanisms, presenting theoretical principles of their functioning vividly. In other words, it is a process of reverse explication of the main idea from its implementation in real structures, machines and mechanisms. Let us comprehend the practical implementation of this educational technique.

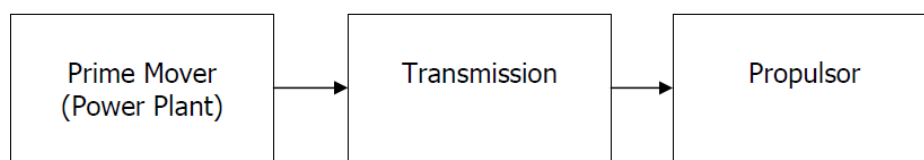


Figure 3 a. Principal diagram of propulsion system main components

It is practical to use principal diagrams (Fig. 3 a) in order to provide the first presentation of objects or processes in order to ensue efficient understanding of new little-known field of knowledge by the students. Here we use an educational technique of visualized retention as another powerful cognitive process. It stimulates the containment of a notion in learner's memory that was once perceived. The visual image will be revived in all the cases of reference to the same object or process in the course of further, more profound consideration or study of the same notion. Presentation of structural elements of

the same unit, depicted in more detail (Fig. 3 b), together with verbal explanation of its operation, will be acquired more efficiently in the relevant ESP material study. E. g.: The torque from the main engine 1 is transferred via the service system 2 to the mover (propeller) 7 by means of shafting 6. The thrust created by the propeller 7 is transferred onto the ship's hull by means of the thrust bearing 4. The shafts are connected with one another by couplings 3.

Hence, structural diagrams, technological sketches, principal schemes, mind-maps, intellect-cards, association cards help us to visually arrange

information for efficient explanation and further acquisition of sophisticated engineering objects and processes in the technology of ship construction,

designation, functions and interaction of ship's gear components, operation and maintenance of marine power plants.

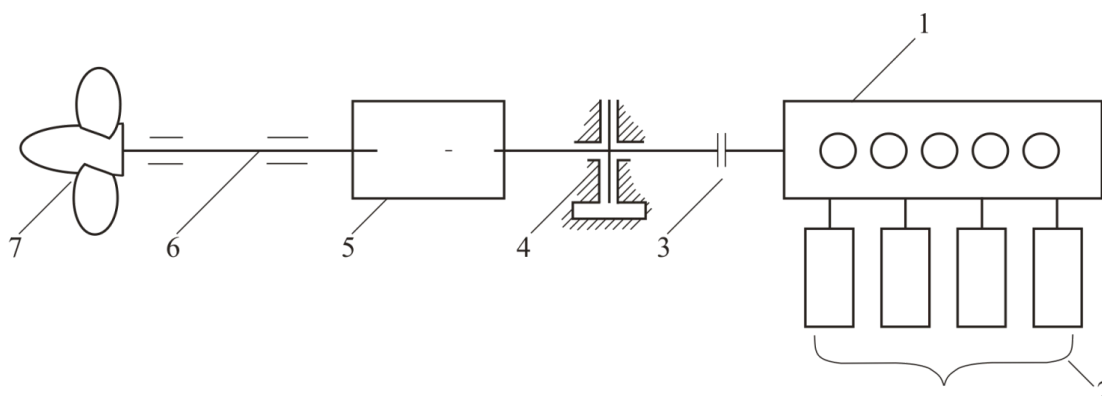


Figure 3 b. Structural diagram of propulsion system (detailed):
1 – main engine; 2 – machinery service systems; 3 – shaft coupling; 4 – main trust block; 5 – gear (transmission system); 6 – shafting; 7 – propeller

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Conclusions

Internal and external visualization as an educational technique was selected as the main focus in acquisition of terminology by the shipbuilding major students. Four aggregate approaches were analyzed and demonstrated on the basis of examples used in ESP teaching and learning within the frames of the Joint Sino-Ukrainian Project. This article is a partial result of the educational reform project of Zhejiang

Province "The Vocational English teaching and learning research from the perspective of ESP" (jg2015390). (本文系浙江省高等教育教学改革项目“ESP视域下的高职英语教学研究”(jg2015390)的阶段性成果)。

The role of orientation metaphors, forms and shapes nomination in technology, somatic lexis case study, and classification generation were proved essential as powerful tools of cognitive processes. Their practical implementation into teaching and learning was shown on practical examples of presentation, identification, retention and explication techniques.

The core of the systemic study of these technique applications requires further development of teaching materials, arrangement of intermediate and final control of competence acquisition and consideration of a number of other aspects of such a complicated process control of ESP teaching.

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