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**МОДЕЛЬ ОБУЧЕНИЯ ИНОСТРАННОМУ ЯЗЫКУ СПЕЦИАЛЬНОСТИ В ТЕХНИЧЕСКОМ
 УНИВЕРСИТЕТЕ**

Аннотация

В статье представлена новая модель лингвообразовательного процесса, которая может быть реализована в практике преподавания иностранного языка в техническом университете. Предлагаемая модель учитывает характерные особенности мышления студентов технических специальностей и представляет собой матрицу с бинарной оппозицией. Заполненные клетки матрицы в наглядном виде представляют собой структуру содержания знаний об изучаемом языке. Знания о системной организации языка, представленные в виде матрицы, открывают обучающимся возможности осмысления «языка в действии» в системе координат, близкой их левополушарному типу мышления. Знание особенностей работы доминантного полушария студентов технических специальностей (инженеров-физиков) позволило нам смоделировать лингвообразовательный процесс в техническом университете. Сложное переплетение составляющих лингводидактики обязывает преподавателей иностранного языка принимать во внимание результаты исследований в области функциональной межполушарной асимметрии мозга. Акцент на возможности левого полушария, как доминирующего у этой категории обучающихся, должен изменить подход преподавателей иностранного языка к построению лингвообразовательного процесса в техническом университете. А также учитывать, что качества, определявшие жизнь в информационном веке, остаются необходимыми, но их одних уже недостаточно для личностной самореализации в новом концептуальном веке.

Ключевые слова: модель, процесс обучения, матрица, левополушарное мышление.

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**THE MODEL OF TEACHING A FOREIGN LANGUAGE FOR SPECIFIC PURPOSES IN A TECHNICAL
 UNIVERSITY**

Abstract

The article presents a new model of a linguistic educational process that can be implemented in the practice of teaching a foreign language in a technical university. The proposed model takes into account the characteristic features of mindset of students of technical universities and faculties, and it constitutes a matrix with a binary opposition. Filled-in matrix cells represent a structure of the language knowledge content in a visual form. Knowledge of the system organization of a language helps the students to understand "language in action" in the way that corresponds to their left hemisphere mindset. The knowledge of the dominant hemisphere cerebration peculiarities of the students of technical specializations (engineering physicists) lets us model a lingvo-educational process in a non-linguistic university. A complex linking of lingvo-didactic components makes the teachers of foreign language take into consideration the results of the research in the field of functional interhemispheric asymmetry of the brain. The emphasis on the abilities of the left hemisphere dominating among the students has to change the approach of the teachers of foreign languages to the organization of the linguistic educational process in a technical university. It is also important to consider that the skills which led the life in the information age remain necessary, but they alone are no longer sufficient for personal self-realization in the new conceptual age.

Keywords: a model, teaching process, a matrix, a left-hemisphere mindset.

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It has already become obvious that the extent and rate of changing thing and social human environment will increase. Education does not have a right to ignore the problem of the world variability, knowledge outdated, stereotypes in thinking and acting patterns, obsolescence of common forms, methods and work practices, the ways of their organization etc. This means that it is not enough just to develop ways of adaptation to the changing environment and the achievements of scientific and technological progress.

The well-known American expert in the sphere of socio-economic trends Daniel Pink notes that the past 100 years of Western society in general and American in particular were in the power of highly specialized and rigorously analytical mindset and world perception. It was the epoch of "knowledge workers" – highly educated specialists, capable of information processing and making expert conclusions. We agree with the concept of D. Pink that nowadays the features of the left-hemispheric mindset, that defined the previous era, are still relevant, but not enough by themselves. These days to achieve professional mindset and personal self-realization both individuals and organizations have to develop an integral mind.

The changes that take place in the modern world suppose a revision of ideas and approaches affecting the process of

education. It firstly deals with training specialists for the new epoch which requires creative, global mindset. In the perspective of the upcoming transformations the process of teaching foreign languages to the students of non-linguistic faculties requires careful thought and rational organization.

Teaching specialists it is important to consider that a foreign language for them is a tool for cross-cultural communication and a way to improve their professional competence. In this case learning the language of one's professional sphere becomes the major element for the development of his/her professional competence.

Training specialists (engineers, doctors, tourism personnel) for working in France has allowed us to conclude that to teach French for specific purposes there have to be different models for linguistic educational process organization. We offer 3 models of teaching a foreign language, where each model takes into account the field of specialization, the peculiarities of lateral thinking and professional awareness of students. The model of organizing a language for specific purposes course is focused on the final goal of training – the ability and willingness to perform as a specialist when speaking a foreign language.

Modern pedagogic research has used the method of modelling more and more often as projecting new models of

educating process provides us with new information about the object under study and, as A.N. Dakhin supposes, “pedagogic modelling works for model-goals, i.e. ideals which pedagogic practice tries to reach” [1]. Consequently, “the aim of modelling is to transfer the received new knowledge about the features and behaviour of the model to the real object” [2]. The aim of our research is to implement the suggested models in the foreign language teaching practice in technical universities.

Questionnaire survey of students in non-linguistic universities has showed that the main difficulty for them in the process of learning a foreign language is represented by the system of the language or, in their understanding, its absence. For the majority the language presents a chaotic set of elements, structures where the rules are not strict and there are many exceptions for them. The variety of language forms and lexical material, the richness of language in general leads to overwhelming mistakes made by the students of technical specialization. In our opinion, the difficulties in teaching foreign languages to the students of non-linguistic universities lie in the fact that the teachers of foreign languages do not consider the following:

- the difference between the system of language and the system of STEM sciences;
- the quality of professional mindset and professional consciousness of students of this profile;
- psycho-physiological peculiarities of the students associated with interhemispheric brain asymmetry.

An important aspect, as we see it, is the consistency of the foreign language as the object of study because the linguistic knowledge to be acquired reflects the theoretical basics of the language as the system. We suppose that it is possible to create a “matrix” of the language system which will serve to the students as a “guide” in the system. Filled cells of the “matrix” will visually represent the general structure of linguistic knowledge. The knowledge of the language system provides the students with the opportunities to understand “the language in action” and, as the result, adequately use linguistic means in their speech to express the thoughts about the subject.

One of the most important parameters of linguistic competence and linguistic identities typology is directly connected with the asymmetric structure and functioning of the brain cortex – its left and right hemispheres– which demonstrate the different degree of activity. It has been proved that memory which influences the usage of ready units is connected with the functions of the right hemisphere, while the left hemisphere is “responsible” for analysis and synthesis, the creation of linguistic units. The right hemisphere keeps the units, the left – the rules, the right deals with the mechanisms of actualization, the left – with the ones of derivation. The right hemisphere mostly determines nominative activity, the left – syntagmatic. There is no need to oppose the hemispheres in the axiological aspect. They are different in quality and they “need” each other. For example, intuition or heuristics exist both in logical and image-associative variants, and they both have their advantages and limits. Being different, left- and right-hemispheric qualities of linguistic ability as well as the bearers with different degree of left- and right-hemispheric components’ activity require different methods of developmental influence [3].

Students of physico-mathematical universities and faculties are in most cases the representatives of left-hemispheric type of mindset, and it means that the left-hemispheric formal-logic components of mindset organize any sign material in such a way that a strictly ordered and

unambiguous context is created, which is necessary for successful communication between people. The elements of the unambiguous context can be represented not only by words but also by other signs, symbols and even images. The left hemisphere is responsible for conceptual, convergent (aimed at the only possible solution) mindset, it identifies one figure from the background and works with the information in the focus of attention.

The left hemisphere contains a discrete model of the world, divided into separate elements. The left-hemispheric mindset is considered to be abstract-logic, predictable, rational and two-dimensional (on the subspace). The predominance of the left-hemispheric functions is revealed in the language by the units which contain more general, abstract notions, reflecting basic functional characteristics of the objects of the real world. Consequently there is a tendency for the binary form of modelling. One should take into account that “the images of the right hemisphere are also characterized by certain abstraction, but the left controls pure notion analysis and generalization (can operate with abstract philosophic categories, mathematical notions without figurality, such as integral, cosine)” [4].

Having analyzed much evidence about the nature of the functional asymmetry of the brain [8], [9], [10], [11], [12], based on the research results from the fields of neuropsychology and psychophysiology, we have concluded that the basic model for learning the language system of a foreign language (French) by the students of physico-mathematical universities and faculties represents a matrix (Fig. 1).

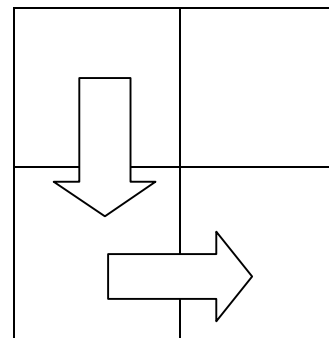


Fig. 1 – Matrix with binary opposition

The preference is given to the binary opposition as the matrix should not be overloaded with elements. As we have mentioned before, the left hemisphere comprises the discrete model of the world divided into separate elements. The amount of the elements should correspond to the structure of the matrix: 2x2, 3x3, etc. The matrix as the model can be filled in with various linguistic material (grammatical, lexical). The key word for completing the task is algorithm, a stepwise choice of elements. It’s important to remember that to process the information the students with the left-hemispheric mindset need time to think the information over consequently and linearly.

Let’s consider how this model works for teaching the system of tenses and moods of the French verb. Firstly we suggest introducing the system in the levels of a table (Table 1):

Table 1 – The table of levels

Zero level	Infinitif	
I level	Impératif	Présent
II level	Passé immédiat	Futur immédiat
III level	Passé composé	Futur simple
IV level	Imparfait	Conditionnel présent
V level	Plus-que-parfait	Conditionnel passé
VI level	Subjonctif	

In the given table (Table 1) the form of representing tenses and moods corresponds to the model of the matrix with binary opposition (Fig. 1). The vertical columns present 5 levels, including the basic forms of Past and Future tenses of the verb from the easy to the complex. Horizontally each level presents the formation of the verb forms to produce an utterance, from the learned form to the new.

We find it rational to begin learning the system of French verb from Impératif as in the future these forms help students to learn verb conjugation in Present without rote memorization (Table 2)

Table 2 – Matrix

<i>Impératif</i>	<i>Présent</i>	
Parle!	Je	parle
	Tu	parles
	Il, Elle, On	parle
	Ils, Elles	parlent
Parlons ! Parlez !	Nous	parlons
	Vous	parlez

These forms of Impératif of the French verb will let the students derive 3 forms of Present tense, but not the 6 forms the way they exist in the traditional grammar. The 3 learned forms of Impératif help the students to logically move to conjugation of these forms in Present indicative tense, paying attention only to the endings of the 2nd and 3rd person plural forms.

The given matrix presents the conjugation of French verbs of the 1st group in Present indicative tense in the system of coordinates which is comprehensible for the students with the left-hemispheric mindset. The matrix as the model is not overloaded with elements, it is based on the familiar units of the verbal system (the first column presents the forms of the Imperative). There are only two new elements to learn and acquire: the doer of the action and the endings of two verb forms. It is necessary to mention that the verb endings that appear in the Present tense are more important for the written form of the language. In oral speech these 4 verb forms sound the same.

Taking into consideration that the students with the left-hemispheric mindset process the information consequently and linearly, we suggest teaching the verb system of the French language by levels, following the linear principle and algorithm. The choice of elements (verb forms) that are necessary to construct an utterance is made step-by-step: at the zero level one defines the notional meaning of the verb (infinitive), then the tense or the mood is chosen in the table of levels, afterwards one follows the scheme of forming the tense at this level.

For example, to produce an utterance in Present Indefinite tense the speaker follows the scheme, at zero level chooses the necessary verb, its infinitive. To use the verb in the utterance one has to go to the first level and form Imperative, which serves as the base for the necessary form of Present Indefinite (Fig. 2).

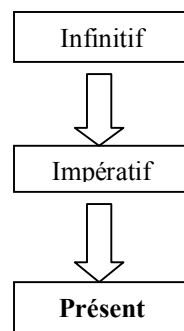


Fig. 2

But if the aim of the speaker is to mark the action that has happened recently or is expected in the future, he/she selects the second level. At this level the creation of the necessary tense form happens horizontally, within the level (Fig. 3).

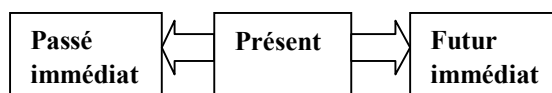


Fig. 3 – Level 2

As we see, the formation of the given tenses of the French language presents 2 different levels, vertical and horizontal, this does not let them overlap with each other and mix the levels either with verb formation or their further usage. The formation of the tenses (Futur immediate и Passé immédiat) can be also presented as the matrix, where the studied forms of the verbs “aller” and “venir” in the Imperative help not to complicate the construction and refer to the studied verb forms. The suggested matrix as a model of learning the system of conjugation of the French verb takes into consideration the peculiarities of information processing by the left hemisphere and helps the students to acquire this system using the possibilities of the left-hemispheric mindset.

Everything mentioned above is important for organizing the process of teaching a foreign language as there are 2 parties in it. They are the teacher and the student who are the outstanding representatives of 2 different mindsets: the teacher of foreign language – the artistic type (the right hemisphere dominates), the student – the intellectual type (the left hemisphere dominates). They are diametrically opposite due to the mindset, the world perception and categorization, the notions conceptualization. We believe it is the main problem in creating an effective process of teaching a foreign language to physicists and mathematicians by teachers who are linguists.

The scientists note the interconnection between the lateral brain organization and aptitude to a certain type of professions. “It has been stated that in the human mental activity the dominance of a particular hemisphere determines the choice of profession and the success of its realization, so that early detection of these peculiarities helps to optimize person’s life path” [5, P. 57]. The above mentioned fact is very important for the organization of teaching a foreign language as there are two participants in this process: the teacher and the student, who represent two different mindsets. In her research A.L. Sirotyuk gives a detailed description of representatives of different mindsets and provides a list of professions which are chosen by people with the dominance of the left or right hemisphere. A teacher

of foreign language usually presents the right-hemispheric mindset and has a spatial-imaginary way of thinking. "He/she operates mainly by images, event-situational presentation of information dominates, the way of thinking is associative-empirical, metaphorical. A student of a technical university is the representative of the left-hemispheric mindset with a logical-verbal way of thinking. He/she processes information that is presented only in verbal-sign form, the presentation and usage of information is "net-like" based on formal-logical way of thinking" [6, P. 156].

Based on the characteristics of the representatives of different types of mindset one can say that the teacher of a foreign language is an artistic type (the right hemisphere dominates), the student – a thinking type (the left hemisphere dominates). We suppose that they are diametrically opposed in the type of the mindset, world perception and categorization, notion conceptualization. And this constitutes the main problem of constructing an effective process of teaching a foreign language to the students of technical specializations by teachers-linguists.

In the conclusion we would say that much evidence about the nature of functional brain asymmetry, about the existence of the individual profile of asymmetry allows us to

use the results of the scientific research from different fields to create the process of teaching foreign language in non-linguistic universities. In our research [7] we analyze the basic approaches to teaching the French language in the system of training the specialists of technical profile, study the methods of organizing the process of teaching foreign language for specific purposes and suggest a new model of teaching future engineers and architects. The given model would be variable and oriented on the final aim of specialist training – having a good command of a foreign language in the sphere of professional communication and fulfilling professional tasks with the help of a foreign language in the professional sphere. But to solve this problem the teacher of foreign language has to acknowledge that firstly it's important to change one's opinion about and the perception of psycho-physiological peculiarities of the students of technical professions and to understand the difficulties that they face in the process of learning a foreign language. We consider that the teacher of foreign language in a technical university when modelling and organizing the process of education should assume the students' understanding and processing the language material under the influence of the usually dominant left hemisphere.

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