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Foreign Students' Training in the Language of Science: Urgent Issues

This article examines problems of foreign students' training in the scientific style of speech at the pre-university level of education. Students' acquisition of a professionally-focused competence is based on the development of their system of scientific concepts. Effective realization of complex purposes of training is possible in the context of the personal-sense paradigm on an integrative basis. The authors consider the modular structure of training materials is the most optimal form of organizing teaching materials, which provides a sense-creating context. In conclusion the authors deduce that in the modern humanistic, subject-subject, sense-personal paradigm there is a necessity of complex integrative use of reflexive sense-creating technologies and sense-techniques, enabling to intensify cognitive process, to promote development of trainees' sense sphere.

Keywords: professionally-focused competence, sense-personal paradigm, teaching material, modular organization.

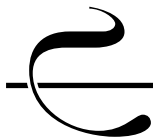
The present stage of the development of a single information-research space presupposes students' high level of a subject-scientific competence, developed scientific thinking, and well developed scientific and professional skills.

When training foreign pupils the realization of objectives starts at preparatory faculties for foreign citizens where they carry out the pre-university training of pupils who have arrived for specialized secondary or higher education in educational institutions of Russia.

Considering problems of foreign pupils' training at the pre-university level, we consider training in Russian language as means of communication in a new society, means of socialization and acculturation in the new polycultural educational environment, the most important part of the educational process.

The educational standard for Russian for foreign students includes pupils' training in both the general-literary language and the language of science. It should be noted that in the context of problems of foreign pupils' training in Russian the "language of science", "scientific style of speech", "professional language" concepts are widely used in educational and methodical literature and have almost equivalent meaning. In a narrow sense the "language of science" concept reflects the general direction of the educational process and the general content of a school subject (in opposition to the general-literary language). The "scientific style of speech" reflects a linguistic orientation of a course. The "professional language" concept points out the professionally-focused content (saturation by specialized terms, text material in a future profession field) usually offered in universities at the last grades.

Scientific language or the language of science constitute a part of Russian which is used in the spheres of educational-professional and scientific activity and is char-



acterized by its lexical, morphological-syntactic features forming a special style – the scientific style of speech. Thus, it is the language of science, its special scientific style of speech that is a means of foreign pupils' gaining a qualification. It becomes the most important maker of the educational process at the preparatory faculty. Trainees' training in perception of the educational information in Russian of general-theoretical disciplines at the subsequent grade level is a priority problem of studies in the scientific style of speech presented by a corpus of scientific-subject content of students' future specialty.

The basis of realization of the posed problem is pupils' acquisition of the language competence providing the development of the speech and communicative competence which assumes the development of skills and abilities in all the types of speech activity necessary for satisfaction of future students' needs for communication in the educational-professional sphere, i.e. skills of reading and making an abstract of educational-scientific literature, hearing and writing lectures, generation of scientific monological and dialogical speech etc.

Studying the scientific style of speech has taken shape of an independent academic subject at present: the subject place in the training system is defined, the purposes and aims depending on a grade level are outlined, techniques and methods of training are offered. In spite of this, more frequently teachers of the first year of universities, where foreign students continue their education, speak about a low level of students' professional-focused competence, students' inability to carry out educational activity in Russian to the full. It becomes obvious that the problem of foreign pupils' training in the language of science as a means of learning of trade remains one of the most difficult and inconsistently solved from the whole complex of pedagogical and methodical problems.

Long-term observation of the educational process course speak about the fact that existing contradictions, difficulties in definition of the priority purposes, aims, and also the content of training are substantially caused by a specific and integrative character of a subject: scientific unity of its linguistic and scientific-subject aspects, its double role – to be a purpose of training and a means of scientific-subject information acquisition.

Thus, in most cases teachers-experts in Russian language and literature focus their attention on the language aspect, using scientific-educational texts as an illustration of a language material, i.e. consider the scientific style of speech from a purely linguistic position, estimating it as a special functional form of the literary language ensuring the professional sphere of communication and possessing special style lexical-grammatical characteristics [6].

It is logical that the language, style-creating lexical-grammatical material, providing the development of speech abilities and skills, is the defining component of the content of training in the "scientific style of speech" aspect.



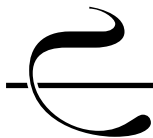
Thus the analysis of the educational process shows that at the scientific style of speech lessons teachers-experts in Russian language and literature use the same methods of work as at the neutral style of speech studies, don't make any difference when semantizing the words designating ordinary, everyday concepts and scientific concepts which level of formation among students is various. Everyday concepts are well acquired by pupils in result of their practical life experience gaining; they freely operate with them in their native language, language-mediator, easily carrying out the transfer of logical-semantic links of everyday concepts into Russian by means of Russian equivalents.

The case is somewhat different with scientific concepts. Practice shows that even the most common concepts such as *cell, organism, nucleus, metabolism, property, process, environment*, etc. are not developed to the full; pupils did not have sense connections between concepts. They only have a vague idea of what senses can express these concepts and in what contexts. It is obvious that if a subject does not know what he wants to say, no language means will help, because, as we know, intelligent speech activity is impossible without thinking (L. S. Vygotsky, 1982; A. A. Rubenstein, 1997; A. N. Leontyev, 1977).

It is obvious that the approach to a problem of training in the language of science at the pre-university stage should not be linguistic, which contradicts the integrative character of a subject. Instead of this it should be general-scientific, general-pedagogical, making it possible to see the language of science as the interconnected system of scientific concepts which has to become the most important construct of the content of training. The content of teaching material should include the system of the tasks developing and forming general scientific and most common professional concepts, namely: differentiation of essential and minor signs, interpretation of concepts, formulation of definitions, exemplification, construction of superordinate concepts and generic terms, etc. At this approach the realization of the language of science function as a means of knowledge acquisition, means of gaining a qualification is possible.

In our opinion, another aim which is badly solved within traditional approaches and methods is management of the process of pupils' mastering a training material and increasing their motivation. It is directly connected with psychological aspects of the educational process. Foreign pupils often show a low cultural-educational level, low communicative requirements which do not correspond to communicative needs of training at a high school stage. It is possible to say that they find no sense in studying a new subject (scientific style of speech), do not understand its essence, do not realize its role in learning a trade. Quite often profile educational-scientific texts do not attract a particular interest. The substantial aspect of texts is known from general-theoretical courses; the interest in studying language means disappear already at an understanding stage.

It is obvious that in these conditions there is a necessity of the approach at the heart of which there is the interaction of psychological and didactic concepts, possibility to involve internal sense structures of the person in the educational process,



mechanisms of various psychological manifestations, to make active consciousness, self-knowledge, self-actualization, self-control, and also the development of pupils' personal sphere, to increase the efficiency of pupils' acquiring the educational-professional competence. The personal-sense approach is such an approach (A. T. Asmolov, 2002; D. A. Leontyev, 2000; I. V. Abakumova, 2003, etc.).

Transferring the content of training in the language of science (its linguistic and scientific-subject aspects) at the personal-sense level will enable pupils to reveal and realize the sense of knowledge necessary for them, will create new personal senses, sense integration, generating higher-order senses of higher order. It should be noted that problems of questions of transferring the knowledge at the personal level in the process of transformation of objective meanings in personal senses, in the process of training were an object of research even in works of A. N. Leontyev and his followers. The important place in A. N. Leontyev's works is occupied by the idea about the possibility of overcoming a gap between the cognized and the cognizable, filling knowledge with the personal sense stimulating pupils' personal sphere development. Thus, the role of motivation, motivational stimuli, providing successful implementation of any productive activity, becomes obvious [4]. Leontyev has named the motive initiating activity and giving a sense to it as the main leading sense-creating motive. It is obvious that for effective studying Russian as a foreign language, in particular, the scientific style of speech, pupils' sense-creating motive for its studying is very important. As long-term observations of the educational process at the preparatory faculty shows, studying psychophysiological features of pupils, system of their value orientations, knowledge of Russian enter into the structure of sense-value orientations of pupils learning Russian as a means of gaining a qualification. Unlike pupils and students learning foreign languages, who need explanation of the value of the possibility of the cross-cultural communication expansion, prospects of training, practical training, work abroad etc., foreign pupils have already chosen Russian as a working language and communication language. They want to learn Russian, to be fluent in it; they study intensively 18 hours per week at the preparatory faculty.

Nevertheless, as practice shows, foreign students have considerable difficulties in development of Russian and, in particular, the scientific style. The analysis of practical work of pupils, observation of features of social-psychological adaptation of pupils in the new cultural and educational environment speak about the inability of the majority of foreign pupils to master a necessary level of the professional-focused competence in existing pedagogical conditions, including traditional approaches, methods and teaching techniques. Teachers-practicians note pupils' excessive load, when besides Russian they intensively study general-theoretical subjects. Homework in two-three subjects takes from 4 to 6 hours on the average daily; at lessons it is difficult for trainees to concentrate the attention on a studying subject for a necessary time; their interest, activity etc. decreases.



It becomes obvious that only special methods, reflexive technologies focused on pupils' sense-creation can stimulate pupils' mastering a necessary level of the educational-professional competence. Forming the educational sense-creating context which is understood as a system of sense technologies and sense techniques, promoting pupils' sense-creation, is an important and indispensable condition of any technology focused on pupils' sense creation (A. G. Asmolov, D. A. Leontyev, F. E. Vasilyuk, etc.). In her books "Education and Sense: Sense-Creation in the Educational Process" and "Sense Didactics" I. A. Abakumova gives the detailed description of the technologies focused on sense-creation, reveals possibilities of their use depending on a character of the material content, trainees' level of the sense sphere development, grade level.

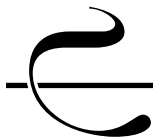
I. A. Abakumova emphasizes the following groups: "technologies providing self-actualization of pupils' subject experience (emotional-psychological generalization, emotional-psychological outstripping, personal-sense context, transformation of a theoretical material in a figurative one); dialogue technologies (external, internal, multiple dialogues); technologies ensuring pupils' self-expression (success situations, self-differentiation and self-individualization zones, method of personal-significant concrete situations, sense immersion), technologies of a problem-creative type (initiation of creative activity, problem situations), etc." [1, 9].

On the one hand, a variety of the presented technologies enables teacher to choose technologies adequate to pedagogical conditions, but on the other hand, demands an enormous work on reorganization of a training material according to regularities of the sense-creating process on adaptation of technologies (techniques, sense techniques) to features of an educational subject.

As the experience of practical work on foreign pupils' training in the scientific style of speech with use of various sense-creating technologies shows, in this concrete case the technologies providing self-actualization of pupils' subject experience, technologies of the directed transmission of sense, dialogue technologies, technologies of psychological-didactic support, and technologies of a problem-creative type are the most effective.

It is obvious that training in the language of science from a position of the personal-sense approach demands a special organization of the educational process, special means, which can start up sense-creating mechanisms. We think it is optimum to choose a training material according to lexical-semantic subjects reflecting types of speech statements, characteristic for the language of science. These are description, narration, reasoning which have special language parameters. On their basis we have identified groups of objects which should be described and which have defined sense-speech situations (communicative subjects). These were "general qualification of a subject", "structure description", "description of properties of a subject", and "description of properties, structure and functions of live systems", etc.

A long-term practical experience with use of various teaching aids in the scientific style of speech has showed that in the context of the personal-sense paradigm



the best way of organizing a material, which makes it possible to integrate various training materials, ensuring a sense choice, internal differentiation in the educational process, is a block-modular construction where each subject (block) distinguished by us reflects in its structure an ideal model of activity (image-analysis-action), communicative (development of speech, communicative skills), search (development of skills of search, viewing reading, making an abstract), and audio-linguistic skills (development of skills of audition, writing of lectures) [2].

The purpose of the first modules is forming a motivation-orientation base for further development of language, speech, communicative skills and abilities that means, first of all, introduction, interpretation, revelation of the content and scope of key concepts of a subject. Thus, in the first module of the first subject the content of training includes such common and general scientific concepts as *planet, earth, sun, water, atmosphere, environment, subject, object, nature, wildlife, inanimate nature, animal, plant, human body, signs, external signs, internal signs, property, structure, etc.*

The specified concepts are included in the content of a special introductory general scientific text, revealing basic proposition of a subject and forming a wide sense context which we understand as a complex of the obvious and associative meanings connected with the content and coming home to pupils' subject experience. Such a context can create a situation which, according to A. A. Verbitsky, is a "unit" of the work of the teacher and the student; "in all its subject and social polysemy and contradictoriness it is considered as a general sense field defining a system of conditions inducing the subject and mediating his/her activity". In our opinion, the main link of such a field, is a sense identification of the offered concepts, distinguishing their essential and minor signs, their rating as concepts of higher generalization, etc. that is a subject of dialogue where pupils, relying on their own personal semi-everyday and semi-scientific representations and concepts and comparing them, disclose a new sense of the comprehended reality.

Pupils have already met with the majority of concepts, entering the text content, when learning an introductory course in subjects at the lessons in profile disciplines or at the lessons in the neutral style of speech. However at the lessons in the scientific style of speech, integrative in their essence, the development of concepts and stronger acquisition, in transferring their objective meanings at pupils' personal subject level in the context of a sense-creating situation is possible.

The second modules of each block subject – informative-operational – assume direct practical work on the development of skills and abilities using the already presented in first modules general scientific and profile vocabulary, lexical-grammatical constructions necessary for construction of a speech statement on a subject.

The development of language and speech skills takes place when performing a number of consecutive tasks (language, prespeech, speech), including work with microtexts, tables and other visual methods providing a stage-by-stage forming speech



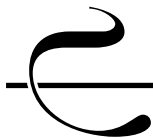
skills and abilities in reading, writing, speaking (monological and dialogical speech) at the level of sentences and microtexts, and also specially modeled (grammar) texts of a general scientific character. The material is offered by an inductive method for active and receptive (vocabulary part) learning.

However observation of pupils' passing the second module shows that in spite of the fact that the sequence of tasks corresponds to the stage-by-stage logic of formation of intellectual actions, pupils' interest in performance of tasks and motivation have considerably decreased.

It can be explained by the fact that, having acquired meanings and senses of offered lexical-grammatical constructions, even when passing the first module and the beginning of the second, pupils find no sense in performance of tasks for the development of language and speech skills; they have no interest in reiterated repetition of language forms of models, samples. Without this the automation of language skills is impossible, thus, language acquisition is impossible. It is obvious that pupils lose the self-control mechanism which worked when the material (the system of concepts) which found a support in a personal and sense field of trainees, in their subject experience, was the object of learning

Considering possibilities of the initiation of the process of trainees' sense-creation in cases when the direct object which should be mastered is of little significance, uninteresting or when the general educational situational motivation of pupils is reduced, we consider it expedient to use a so-called method of "indirect objects". Any fact, any problem, any subject, etc., entering the context of the semantic field of a studied material and being significant for a trainee, touching his/her subject experience, his/her personal meanings may be such an "indirect object". Thus, in this case a comparative analysis of language means (morphological-syntactic structures) of Russian and a trainee' native language or an intermediate language, by means of which the communicative content of a subject is expressed, may be such an indirect object of discussion in various dialogical forms. Pupils participate in dialogues with enthusiasm, ask questions like, "How can I characterize a subject in English (in Arab)?", "How can I formulate a definition?", "What sign underlies the characteristic?", etc.; they make up a sentence in their own native language with interest and then translate it into Russian using necessary language means, compare features of functioning of language means in different styles of speech in native and Russian languages etc. Thus, the tactical objective of the second module is achieved. It consists in repeated use of language means of Russian in various communicative sense-creating situations of real communication with the purpose of automation of language and speech skills.

The third module of each block-subject (communicative) provides complex development of main types of speech activity, i.e. reading and making an abstract of educational literature, reproductive monological and dialogical speech. The informative-subject aspect of training is provided by the educational texts intended for studying



reading, carrying out the logical-sense analysis of the text content: allocations of the main information, text partitioning on semantic parts, drawing up the abstract, answers to questions, and also retelling. The supposed work with the text is important for successful formation of the communicative educational-professional competence of future students, directly trains them for educational literature reading, participation in seminar studies etc. at the high school level of education.

Thus, the offered text in the third modules should either be approached to texts of training aids in profile disciplines by the content, form, language filling, but thus be available by complexity and scope, correspond to a communicative subject, or have general scientific, scientific-educational character, contain information which is significant to trainees, capable to initiate their sense-creating activity.

Thus, in our training materials we offer texts: "Water" (subject I), "A Little Bit About Anemia" (subject IV) which, besides high saturation by language structures in a studied subject, have wide general scientific, social- and subject-personal contexts, a complex of personally meaningful subjects for discussion by pupils as indirect objects. Texts "On a cell", "Mechanical movement", "Metabolism", etc., created on the basis of educational texts of profile disciplines, have a wide scientific context, considerable linguistic potential, however, as practice shows, do not cause a particular interest among trainees. Pupils fulfill logical work with the text, answer questions, analyze the use of grammatical means etc., but they do it rather formally, without interest, since they already know the scientific-subject information from a school course, general-theoretical courses of preparatory faculties.

It is obvious that the task consists in transferring speech skills to the personal sense level on a certain lexical-grammatical and scientific-subject material. Practical experience shows that this is possible if for discussion one finds a personal-significant indirect object of the background information being behind a direct object and providing operation of mechanisms of sense-generation.

Considering the aforesaid, we would like to note that in the conditions of modern humanistic, subject-subject, personal-sense paradigm we need a complex integrative use of reflexive sense-creating technologies, sense-techniques, making it possible to intensify the cognitive process, to promote the development of trainees' sense sphere.

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