

# Methodology of developing future IT- specialists' competence in reading and speaking

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**Abstract:** *The article defines the goals and content of interrelated training in reading and speaking in English of future specialists in the field of information technologies. It has been determined that the effectiveness of training is directly proportional to the validity of its content selection, which includes subjective (communication spheres, psychological and speech situations and roles, communicative goals and intentions, topics, problems and texts, speech samples) and procedural (speech skills and exercises for their development, relevant knowledge; skills in operating linguistic-socio-cultural material and exercises for their development, the ability to begin communication relations and exercises for their development, relevant knowledge; lexical, grammatical, phonetic skills and exercises for their development, the ability to operate educational and communication strategies and exercises for their development) components. The list of spheres of communication in the content of interconnected training of reading and speaking in English is concretized for future specialists in the field of information technologies. Typical communication situations in which future computer engineers can use information gained in the process of reading were determined.*

**Key words:** *Methodology, competences in reading and speaking, learning goal, skills, spheres of communication.*

**Metodológia rozvoja kompetencie v čítaní a hovorení budúcich IT špecialistov.** *V tomto článku boli zadefinované ciele a obsah vzájomne prepojenej výučby čítania a hovorenia v anglickom jazyku pre budúcich odborníkov v oblasti IT technológií. Zistilo sa, že efektívnosť školenia je priamo úmerná platnosti výberu jeho obsahu, ktorý zahŕňa subjektívne (oblasti komunikácie, psychologické a rečové situácie a úlohy, komunikačné ciele a zámery, témy, problémy a texty, vzorky reči) a procedurálne (rečové schopnosti a cvičenia na ich rozvoj, príslušné vedomosti; zručnosti v práci s jazykovým a sociokultúrnym materiálom a cvičenia na ich rozvoj, schopnosť nadväzovať komunikačné vzťahy a cvičenia na ich rozvoj, príslušné vedomosti; lexikálne, gramatické, fonetické zručnosti a cvičenia na ich rozvoj, schopnosť využívať vzdelávacie a komunikačné stratégie a cvičenia na ich rozvoj) komponenty. Bol upresnený zoznam sfér komunikácie v obsahu vzájomne prepojenej výučby čítania a hovorenia v anglickom jazyku pre budúcich odborníkov v oblasti informačných technológií. Identifikujú sa typické komunikačné situácie, v ktorých môžu budúci počítačovi inžinieri použiť informácie získané v procese čítania.*

**Kľúčové slová:** *Metodológia, kompetencie v čítaní a hovorení, cieľ učenia, zručnosti, oblasti komunikácie.*

## Introduction

Successful integration of non-English-speaking specialists into the world information space can be ensured provided that they have English-language competence in all types of speech activity. We are talking about listening, reading, speaking and writing, which are the main types of human interaction in the process of verbal communication. According to the nature of language communication in the methodological literature, the main types of speech activity implement oral (speaking and listening), and written communication (reading and writing). In other words, there are productive (speaking and writing) and receptive (listening and reading) types of speech activity. Through receptive types, a person (recipient, addressee) mainly carries out the reception and processing of speech communication (comprehension-evaluation-interpretation). Through productive types of speech activity, a person (communicator, addressee) realizes the process of thoughts, experiences expression, verbal skills as well as will expression in oral and written forms of speech, issues a verbal message in various forms of communication.

It is widely acknowledged that speech activity is forming and evolving in conjunction with the general intellectual development of the individual. W. Humboldt in his work "The Heterogeneity of Language and its Influence on the Intellectual Development of Mankind" highlighted the internal connection of receptive and productive aspects of speech activity. The scientist pointed to the essence of speech activity as a mutually indirect correlation of two complementary processes, one of which breaks down into phases of speech-thought formation and its sound encryption, and the other is the opposite process, which consists of decoding and subsequent reproduction of thought based on language skills and personal experience. The ideal model of speech skills, the ultimate goal of which is the prepared oral speech (presentation performance), combines all types of speech activities, starting with the search for information, both oral (i.e. listening) and written (i.e. reading), then preparation and actual writing a text (i.e. writing) and, finally, the actual speech to the audience (i.e. speaking).

Today the principle of skills interconnected training along with the principles of collaboration, relevance, evidence, alignment, transparency, empowerment is considered as one of the leading methodological principles in the foreign languages teaching which is based on the integrated formation of knowledge and skills.

In the context of the article, the term "interconnected development of foreign language competence in reading and speaking" will be used, understanding its integrated and, if necessary, differentiated nature, which provides a comprehensive formation of knowledge and skills of reading and speaking, taking into consideration their essential characteristics and common psychological mechanisms.

The analysis of modern methodologists works made it possible to identify the didactic conditions that should be the basis for the improving the effectiveness of interconnected training in reading and speaking:

- simultaneous formation of skills in reading and speaking (which does not deny the possibility of precedence of work on the text (Ambrose, Lovett, 2014), with reading and speaking being both a goal and a means of training;

- preparation of students for a certain verbal expression while working with the text;
- use of texts with a view to create an informational and linguistic basis for rhetoric;
- taking into consideration the peculiarities of professional discourse in the process of textual material selection;
- involvement of the reading and speaking skills transfer mechanism;
- written fixation of certain information (e.g. of own ideas).

### **Objective and relevance**

The task of interconnected teaching of speech activity types is a promising field of research, and the problem of the interrelated formation of English-speaking competence in reading and speaking is a novelty in the methodology of teaching foreign languages. All of the above determines the relevance of the selected topic of the paper. The objective of the work is to substantiate theoretically and describe typological peculiarities of professionally oriented language material as well as didactic conditions in which IT-students master it.

### **Methodology. Linguistic features of English “computer” vocabulary**

To develop a methodology of interconnected development of foreign language competence in reading and speaking for future IT experts we'll look at the linguistic features of English “computer” vocabulary, including the peculiarities of reference texts for reading and speaking, that will subsequently be necessary to determine the content of the above type of training. It is well known that with the fast evolution of computer technologies in the late twentieth - early twenty-first centuries, a new computerized society has appeared and formed. Such community was defined as a system of people with the potential reserve of social experience, as well as new values and related innovative technologies. Analyzing the field of new technologies it can be seen that the last decade is characterized by “information revolution” - the emergence of new trends and directions of scientific and technological development and together with them a significant amount of new lexical, semantic and phraseological units in English have also appeared. This can be explained by the fact that new objects, phenomena, and processes need adequate notation in any language.

### **Language tools of English professionally oriented material**

The “network revolution” is also accompanied by the expansion of computer-oriented terminology. Several translation methods are used for “computer” terminology interpretation: transcoding, tracing, descriptive and equivalent translation. Consider the language tools of English professionally oriented material (information technologies field) in the following aspects: morphological, phonetic, lexical, syntactic, stylistic.

The morphological aspect of language tools consists of words that are used in English-language professional texts in the computer field and are of great importance. Thus, a certain number of noun parts of speech (nouns, pronouns, adjectives,

numerals) forms the image in the text in the form of name, state, duration. Verbs, on the other hand, make exposition a dynamic, moving, variable process. In addition, the peculiarity of the engineering texts is the absence or small number of adjectives that actively form the imagery.

In our case, the interconnected training in English professionally oriented speaking and reading in the sphere of computer technologies involves training in creation of oral monologue, namely monologue-reflection or monologue-presentation, which is a text level linguistic unit and involves the operation of coherent and integrated text, i.e. preliminary work with authentic text (Seijts, Latham, 2012). Therefore, here are examples of clichéd phrases and phrases in English, which help to navigate during the monologue-presentation (for example, the presentation of a new program), namely: to recognize the structure, dynamics and duration of the report: *To begin with... . Let's start by looking at .... Well, that brings us to the end of the final section. Now, I'd like to summarize by.... Now, I can just summarize the main points.*

When analyzing professional English-language adapted/translated and authentic texts for reading and speaking, one can trace a slight accumulation of inserted words and constructions: indeed, already, in principle, even, such, at least, finally, so far, however, only etc.

In addition, these English texts are characterized by the presence of various morphological means, in particular:

- specific nouns, qualitative adjectives that convey information about a phenomenon, program, product or service: affordable, complete, economical, easy, fast, small;
- adverbs with the meaning of time, which have a pragmatic meaning in the text: they function as signals of argumentation relating to the linguistic act and associated with the involvement of the current act to the previous: now, before, after, today;
- adjectives of evaluation to strengthen the evaluative function of the statement: impeccable, new, pretty, better, perfect, unique, special.
- use of person categories and number, that is pragmatically important: e.g. *I* – embodies a potential recipient, *we* – indicates the implicit presence of the addressee of the presentation;
- use of intensity prefixes: *super-*, *extra-*, *ultra-*, *mega-*.

The phonetic aspect of language means involves the assessment of the text for the presence of assonances - dissonances, constricted forms of adjectives, the rhythm of accents, alliterations. They are easily defined in artistic style texts, but in scientific and technical texts it is extremely difficult. The sound image of the text-monologue is an important component of its success within the recipients.

But it is necessary to note that in the materials of the computer sphere, the phonetic level is not clearly expressed. Usually, the only thing that is monitored is the smoothness of the text or, if necessary, the fragmentary of speech.

The lexical aspect of language tools is characterized by extensive use of professional terminology in this field and the use of words and phrases that reflect its specificity.

The main thematic groups of English computer vocabulary are:

- A person related to the world of computers.
- A person who prefers anything in the world of computers.
- Working with a computer.
- Computer failures.
- Components of the computer.
- Name of software products, commands, files.
- Computer games.
- Internet.

The main speaking skills in the computer-oriented sphere according to the functional aspect are:

- a) creation of figurative, expressive name of the concept, which already has a neutral meaning in terminology – (expressive function);
- b) transfer of the relation of native speakers to a certain object – (emotional-evaluative function);
- c) producing of detailed nominations for facts and concepts, especially relevant in the minds of speakers, when a certain object is divided into elements and as a result new forms of relations are formed – (function of categorization and systematization);
- d) designation of a new concept, filling of terminological gaps – (nominative function).

The syntactic aspect of language tools is characterized by heterogeneity of professional texts syntax that is achieved through the use of normative syntactic constructions.

The specificity of syntactic language means consists in the use of simple affirmative sentences, abbreviated sentences, elliptical constructions. At the same time compound, complex, incentive and negative sentences are also distinguished.

After analyzing the English-language scientific and technical texts of the computer-oriented sphere, it was found that the active voice of the verb has been used more often, the imperative and conditional sentences have been used less often. More than half of the total number of analyzed verbs were used in the Present Simple tense. The Past Simple tense was used to indicate the fact of a new invention, program, product appearance. Future tenses were also presented in the texts concerning programming results and forecasts.

It should be noted that the syntax of presentation texts is characterized by the use of:

- 1) nominal phrases;
- 2) proposals with homogeneous members;
- 3) various segregations;
- 4) rhetorical questions and appeals;
- 5) complex sentences of simple structure;
- 6) connecting structures, as well as the use of various sentence structures inherent in colloquial speech.

Stylistic aspect of language means involves the use of stylistic techniques, because they serve as a tool of attracting the attention of the recipient, creating a bright, unforgettable, extraordinary image which is the key to successful implementation of

the basic pragmatic attitude of presentation speech.

**Results and discussion. Content determination, learning goals and tasks determination and the development of the exercises system**

The definition, understanding and application of language tools at all the above levels ensures the successful mastery of English-speaking professionally oriented speech by future professionals in the field of information technologies. Thus, the identified linguistic features of computer-oriented speech are the basis for content determination and the development of the exercises system. The content of interconnected development of foreign language competence in reading and speaking of future IT-specialists is shown in the Table 1.

After identifying the main components of the content it is possible to determine the goals of learning. The most effective goals are clear, specific, and challenging (Locke, Latham, 2002). The main principles of goal-setting possess the commitment from the achiever, provide constructive feedbacks, and appropriate task complexity (Johnson, 2012). Research in education has found goals to be essential for increasing student achievement and motivation (Ambrose, et.al., 2010) So, educational, developing, practical, professionally oriented goals of training can be distinguished. All goals are implemented in a comprehensive manner, but at a certain stage of learning, each of them acquires a specific content.

*Table 1 Content components of interconnected development of foreign language competence in reading and speaking for future IT-specialists*

№	Subjective aspect		Procedural aspect	
1.	Areas of communication, psychological and speech situations and roles, communicative goals and intentions, topics, problems and texts.	<i>appropriate knowledge</i>	Formation of reading skills / decoding (the ability to find the necessary information in the text and predict its content; the ability to read selectively; the ability to understand the necessary information drawing on the linguistic conjecture; the ability to ignore unknown language material). Formation of speech skills / coding (training in monologue speech (MS) and dialogical speech (DS)).	<i>appropriate exercises</i>

2.	Linguo-sociocultural material. Social situations.	<i>appropriate knowledge</i>	Formation of skills and abilities to operate with linguistic and socio-cultural material, including: - ability to understand and apply sociolinguistic speech tools and socio-cultural information; - ability to communicate using standardized models of communicative behavior.	<i>appropriate exercises</i>
3.	Language material (lexical, grammatical, phonetic).	<i>Appropriate knowledge</i>	Formation of lexical, grammatical and phonetic/intonation skills in operating with language material.	<i>Appropriate exercises</i>
4.	Learning and communication strategies.	<i>appropriate knowledge</i>	Formation of skills and abilities to operate with learning (long-term competences) and communication (momentary difficulties) strategies.	<i>Appropriate exercises</i>

At the same time, the practical goal of learning involves the acquisition by students of certain knowledge, skills and abilities necessary for the implementation of foreign language communication in all types of speech activity through reading and speaking. With regard to a professionally oriented goal, it is aimed at the formation of: professionally oriented speech competencies in all types of speech activity, professionally oriented linguistic sociocultural competence, professionally oriented language competencies and professionally oriented educational and strategic competence.

The specificity of the practical goal of interconnected teaching of reading and speaking in English for future specialists in the field of information technologies determines two interdependent tasks for solving:

- to teach English as a means of foreign language communication at an intercultural level through English-speaking reading and speaking;
- to teach English as the language of their future specialty, that is, a means of foreign language professional communication in a modern multicultural and multilingual professional educational space.

The leading tasks for the development of a professionally oriented personality of a future specialist in the field of information technology include the following actions:

- 1) to provide conditions for the acquisition of key competences necessary for the English language study and their improvement throughout life, as well as the successful self-realization of the future specialist in the field of information

- technologies.
- 2) to promote the social immersion of Computer Science students into the English-speaking culture, which leads to: awareness of the basic values of this culture, learning patterns of behavior in English-speaking society, acquisition of spirituality and moral and ethical values necessary for successful interaction with other cultures.
  - 3) to stimulate the educational autonomy of students in educational activities, manage it actively and consciously, implement reflection and correction of educational activities with partial independence from the teacher by giving students the opportunity to take over some of his/her functions.
  - 4) 4.to encourage students to be creative in performing productive creative tasks, such as: discussion communication, professional pedagogical role-playing games, preparation and defense of projects, acquisition of a language portfolio, and the like.
  - 5) to provide conditions for students to master civic competence. In particular, to acquire a democratic culture of student behavior, self-esteem and respect for others, the ability to defend their position, be responsible, encourage the desire for collective cooperation and equal partnership.
  - 6) to adjust future specialists in the field of information technologies to the reality and importance of receiving and transmitting professional information in a foreign language orally and in writing in a modern information-developed multicultural society, the importance of independent search, accumulation and expansion of professionally relevant knowledge in the process of direct and indirect communication with native speakers.

The indisputable fact is the interdependence of learning goals with content, because in a certain way the learning goals determine the content of learning. For its part, the content of training consists of components, the mastery of which ensures the achievement of all the above goals. It is obvious that in each case the content and methods of learning should reflect the typical and specific features of the tasks, conditions and problems of communication of specialists in a particular profession. Therefore, the study of the specifics of interconnected professionally oriented reading and speaking of future computer systems engineers is impossible without considering the general problem of the relationship of professional, socio-cultural and speech activities in the communication process.

No matter how many different areas, topics and situations exist in which everyday and professional communication takes place the concept of the education content components is closely related to the issue of selection. Correct selection of volume, distribution, structure and organization of educational material contribute to the realization of the set goals, create an opportunity to manage the educational process through the means (textbook) and methodological techniques.

Therefore, when selecting the content of training one should follow two general principles:

- 1) the necessity and sufficiency of the training content to achieve a practical goal;
- 2) the feasibility of learning content and accessibility.

Provided that the areas of communication in the content of interconnected learning of

reading and speaking in English of future specialists in the field of information technologies include: 1) educational and professional, which partially includes personal - student life, relationships with partners and the satisfaction of personal and household needs, as well as needs in the process of educational and professional activities; 2) socio-cultural, which implies readiness to participate in various events related to the profession, technical exhibitions, conferences, etc.); 3) official-business (mostly business correspondence with representatives of official institutions) the topics for interconnected learning of reading and speaking in English for future computer technology professionals may be defined as the following:

*UNIT 1. Introduction to Computer Engineering. Electronics.*

*Lesson 1. Skimming. (Reading for gist) Electronics. Text types: descriptive, expository (textbook writing, definitions, references, technical and scientific writing). Language work: The Noun. Linking words. Skills: Planning.*

*Lesson 2. Scanning. (Reading for specific information). What is the Difference between Software Engineering and Computer Engineering? Types of Notifications. Text types: descriptive, narrative (notifications, descriptions, memos, synopsis).*

*Lesson 3. Reading for detailed comprehension. How We Manage a Million Push Notifications an Hour. What Happens when We Turn on Computer? Text types: descriptive, expository (how-to-work articles, how-to-work descriptions, introductory paragraph of phenomena in thesaurus). Listening: description essay. Speaking: description of gadgets work, description of the image.*

*UNIT 2. Computer Engineering Concepts.*

*Lesson 1. Skimming. (Reading for gist) Circuit Boards, Digital Circuit Design, Firmware, FPGA Boards, and Microcontrollers. Text types: descriptive, expository (textbook writing; definitions; references; technical and scientific writing; brief, on-line dictionary definitions). Language work: The Adjective. The Adverb. Comparison. Skills: Reading and note-taking for comments.*

*Lesson 2. Scanning. (Reading for specific information). Interfaces. Conventions and Templates. Layering. Algorithmic Complexity. Hashing. Caching. Concurrency. Text types: descriptive, persuasive (comments, opinion news stories).*

*Lesson 3. Reading for detailed comprehension. Cloud Computing. Text types: directive, argumentative (statutory instructions, practical instructions, manuals, how-to-work descriptions). Listening: For and against essay. Speaking: practical instructions presentation which compare different technologies; oral description of the scheme/graph.*

*UNIT 3. Modern Communication Systems. Electronic Components of Communication System.*

*Lesson 1. Skimming. (Reading for gist) Electronic Components (passive components, active components, resistors, rectifiers, circuits, transistors, amplifiers). Text types: descriptive, expository (textbook writing; definitions; references; technical and scientific writing; brief, on-line dictionary definitions). Language work: The Numeral. Skills: Applying for equipment / information / proposal.*

*Lesson 2. Scanning. (Reading for specific information). Modern Communication*

*Systems. Essential Parts of Communication System. Types of Signals. Block Diagram of Communication System. Text types: descriptive, directive (technical descriptions, protocols, characteristics).*

*Lesson 3. Reading for detailed comprehension. The Network and Information Systems Regulations. Text types: directive, argumentative (statutory / practical instructions, manuals, guides, rules). Listening and discussing: problem and solution essay, instruction with explanation. Speaking: presentation of new device with technical characteristics.*

#### *UNIT 4. Computer Architecture and Peripherals.*

*Lesson 1. Skimming. (Reading for gist) Digital System Design. Text types: descriptive, expository (textbook writing; definitions; references; technical and scientific writing; brief, on-line dictionary definitions). Language work: The Verb. Making definitions. Summarizing. Skills: Reading and note-taking for critical review. Reading and note-taking for summary.*

*Lesson 2. Scanning. (Reading for specific information). Computer Organization. Text types: persuasive, argumentative (advertisement, persuasive / directive, invitation, summary, explication, references, reports, presentations).*

*Lesson 3. Reading for detailed comprehension. Wireless Communication. Multimedia Systems. Text types: directive, argumentative (statutory instructions, practical instructions, manuals, guides, rules, regulations). Discussion essay: summary, presentation. Speaking: presentation of new device, description of the chart, presentation of new standards.*

All educational texts and situations are composed thematically, by functional styles and their genres, taking into consideration the typical communicative situations in the educational, professional and socio-cultural spheres. The main types of texts are: speech, report, discussion, news, interviews, short descriptions, article, conversations. Typical communication situations in which future computer engineers use information gained in the process of reading and improved in the process of speaking include participation in conferences, symposia, trainings, projects, meetings with foreign colleagues and discussions of professional issues. The list of communicative situations is presented in the Table 2.

*Table 2 Communicative situations in the process of interconnected teaching of reading and speaking in English for future specialists in the field of information technologies*

<b>Sphere of foreign language communication</b>	<b>Communicative situations</b>	<b>Texts for reading</b>	<b>Topics / Plots for speaking</b>
<b>Educational and professional</b>	International conferences / IT seminars, exhibitions.	Programs of conferences, exhibitions, instructions, scientific articles, tables, graphs, charts, abstracts, annotations, summaries, bibliographic references, theses.	Report-presentation, product / program presentation, discussion, as well as presentation of schemes, diagrams, tables, graphs, abstracts, articles.
	Participation in exchange programs.	Scientific projects, official letters, statements.	Communication with experts, discussions.
	Study / internship abroad.	Internship programs.	Interviews.
<b>Socio-cultural</b>	Informal communication.	Personal letters, messages, chat texts and web forums, etc.	Conversations.
	Reading articles, journals, books.	News, articles, newspapers and journals, reports, interviews, etc.	Discussion of news, articles, etc.
<b>Official-business</b>	Business correspondence with representatives of official institutions.	Business letters. Business correspondence (cover letters). Thank you letters. Complaint letters. Adjustment letters. Bad news letters.	Office life (acknowledgment letters, memos).

### **Conclusions**

In the work the goals and content of interrelated training in reading and speaking in English of future experts in the field of information technologies were identified and itemized. Summarizing the above mentioned we can conclude that the effectiveness of training is directly proportional to the validity of its content selection, which

includes *subjective* (communication spheres, psychological and speech situations and roles, communicative goals and intentions, topics, problems and texts, speech samples) and *procedural* (speech skills and exercises for their development, relevant knowledge; skills in operating linguistic-socio-cultural material and exercises for their development, the ability to begin communication relations and exercises for their development, relevant knowledge; lexical, grammatical, phonetic skills and exercises for their development, the ability to operate educational and communication strategies and exercises for their development) components. We substantiated theoretically and described typological peculiarities of professionally oriented language material as well as didactic conditions in which IT-students master it. The leading tasks for development of professionally oriented personality of the future specialist in the field of information technologies were specified. The list of spheres of communication in the content of interrelated training of reading and speaking in English is concretized for future specialists in the field of information technologies. Typical communication situations in which future computer engineers can use information gained in the process of reading were realized in the text book “Computer system Engineering”.

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