



An Integrated Approach to Teaching Pronunciation and Terminology for Chemical English Students

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Abstract

Teachers of English all over the world realize the significance of pronunciation not only for oral language development but also for the skills of reading, writing and perception. As everyone knows, pronunciation is the greatest source of intelligibility failure. Nevertheless, in practice, because of the time constraints and learning targets versatility, pronunciation is not treated as an integral part of the entire learning process and often grammar and vocabulary tend to take precedence especially in LSP teaching.

In the paper, some ideas on teaching English pronunciation for LSP students by means of special exercises in stress, rhythm and intonation in the view of Russian-English interference and current ICT tools and on the basis of general chemical terminology are discussed. The main task of the class activity is to gain practical knowledge for professional communication (production and reception skills). Independent students' work aims to help them to extend their practical knowledge and skills on their own material (key professional terminology: words, word groups, phrases chosen from the authentic research papers).

Special attention is paid to pronunciation and spelling correspondence in English, as well as to numerous letter-sound misinterpretations and mispronunciations of basic chemical terms borrowed from Latin and Greek to both Russian and English. This approach, according to our practical experience in the groups of master and PhD Russian students of the English language, provides important conditions for further learning of a student – independent, autonomous, lifelong.

Keywords: ESP, pronunciation, terminology, interference, suprasegmental elements

1. Introduction

English for Specific Purposes (ESP) helps the learner use the language as an important practical tool. The language can't be taught efficiently without paying attention to phonetics: pronunciation is significant not only for oral language development but also for the skills of reading, writing and perception. As everyone knows, pronunciation is the greatest source of intelligibility failure. Nevertheless, in practice, because of various reasons, pronunciation is not treated as an integral part of the entire learning process and often grammar and vocabulary tend to take precedence, especially in ESP teaching. Many Russian learners of English have a good command of grammar and lexis but have poor pronunciation and serious difficulties in understanding native speakers and in being understood by them. Many problems in teaching pronunciation are conditioned by underestimation of the main features of phonetics and phonology as a unit of productive and receptive skills, as well as by misunderstanding of the complex relationship between spelling and pronunciation [1, 2].

According to G. Kelly, the author of a very helpful book for the teachers of English, "there are two key problems with pronunciation teaching. Firstly, it tends to be neglected. And secondly when it is not neglected, it tends to be reactive to a particular problem that has arisen in the classroom rather than being strategically planned" [3, p.13]. Many teachers could agree that the most effective approach to the given problem is the shift from reactive to planned teaching. There is no need to explain that techniques and activities will depend on many factors: teaching goals, students language level, their age, classroom situation, etc, but still there are some general requirements that effective teaching process should meet: teacher's good grounding in theoretical knowledge; clear planning with regard to curricula and syllabuses; application of a variety of techniques and activities; access to good ICT tools and resources for the organization of the work – under the English teacher guidance or independently. And, naturally, the teaching process should be native-language oriented and take into consideration L1 and L2 interference for avoiding typical pronunciation errors in speaking and reading (in articulation of vowels and consonants, in stress, rhythm, and intonation).

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In this paper, some ideas on teaching English pronunciation for LSP students by means of special exercises in segmental and suprasegmental features in the view of Russian-English interference and current ICT tools and on the basis of general chemical terminology will be described. We apply an integrated approach for teaching pronunciation in the groups of Russian chemical students (master's course and PhD programme). Pronunciation module, specially devised for them, is called by us an integrated approach as phonetics is taught on the basis of professional chemical terminology, and the material for practice activities is taken from the current research papers in chemical technology, special dictionaries, etc. It's important to note that some exercises, models and examples are given by the teacher, and others, including the ones for independent work and testing are compiled by the students. Such an approach involves the students intelligence as employs material relevant to them. We'd like to focus on two key methodological problems: 1) selection of the teaching material and 2) its presentation in the course. For solving the first problem, while using papers from the research journals and pronunciation dictionaries (and, of course, teachers' experience), a list of the chemical terms for pronunciation training was compiled. The main criterion was not their frequency, but: possible pronunciation difficulty (e.g. *phthalocyanine*, *macroheterocycles*, *grinding*, etc.), mispronunciations as the result of the native language interference (acetone – Russ. ацетон), occurrence of homographs (e.g. lead /li:d/, v – lead /led/, n.) and homophones (iron, ion /aI↔n/); exceptions (granite /ʊgrɒnIt/, words that have several phonovariants (e.g. kinetics: κΙϩνετΙκς, κΑΙ- / [4], κΑΙϩνετΙκς, κΙ-, κ↔ [5]), etc.

Nevertheless, it should be beared in mind that the two major organizing structures of the speech are rhythm and intonation. The speech perception mechanism is such that “ English speakers rely as much on rhythm to identify words as on the consonant and vowel sounds” [6, p.116]. According to some data, “lexical and syntactic errors constitute only 8.8% of the causes of intelligibility failure in Nigerian English, while pronunciation accounts for as much as 91.2 %, subdivided as follows: rhythmic and stress errors – 38.2%, segmental errors 33%, phonotactic errors – 20%” [7, p. 108]. We suppose very similar findings would be for the Russian speakers of English as many of them have difficulties with the production of English utterances with proper isochronic rhythm and correct word stress. That is why, in our pronunciation course we pay special attention to the exercises in rhythm, stress and intonation as individual sounds can be trained by means of various Internet sources (for example, [8, 9, 10,11]). This kind of work is very important for developing students' receptive skills as enables them to understand a wide range of accents, voices and to focus on vowel differences between British and American English, to get used to the acoustic forms of rapid natural speech.

In the classroom, numerous pronunciation, spelling, listening, reading activities and techniques (choral drilling, chaining, eliciting, etc) are performed by means of specially devised productive exercises and tasks. Here are some sample exercises on the sounds, stress and rhythm:

- 1) *Chemical lexis with a typical first syllable stress:* ϩcompound, ϩoxygen, ϩmolecule, ϩmethyl, etc.
- 2) *Contrast stress in Russian and in English international chemical terminology:* окϩсид, хлорид, сульфат, металл, элемент etc. vs. ϩoxide, ϩchloride, ϩsulphate, ϩmetal, ϩelement, etc.
- 3) *English chemical terminology pronounced with the primarily and secondary stress:* electrochemistry, homogeneous, spectrophotometric, potentiometric, polymerization, etc.
- 4) *Stress shift in derivatives:* ϩatom- аϩtomic; ϩcarbon – carϩbonic; ϩmolecule - moϩlecular, etc.
- 5) *Stress shift in word combinations:* analytical applications, heterogeneous analysis, acid-resistant cement, air-corona removal of phenols, diffusion controlled second order rate constant, etc.
- 6) *stress and rhythm:* group/group seven/ group seven elements/ group seven elements chlorine, bromine, iodine; test/test tube/ a glass test tube, a clean glass test tube/.....with a stopper.

Contemporary technologies and a gadget on every student's desk, enable to engage them in recording their sounds, stress, intonation and contrasting with those of a native speaker or with other students, etc.

Compiling the exercises, we also include in them some frequent mispronunciations of the suffixes, Participle II endings (cf.: heated, cooled, mixed,), proper names of the great scientists, physical and chemical units (joule, Roentgen, Angstrom, volt, curie, etc.), the names of the elements from the Periodic Table, chemical and mathematical symbols, as well as pronunciation of Greek letters and some Latin expressions (ab initio, in vitro, in situ, etc).

As for the structure of the module, it is suggested to be divided into two correlated parts: the first one, devoted to phonetics and phonology, contains some traditional theoretical information (on physiology



of pronunciation, articulation of vowels and consonants, stress, rhythm and intonation in English) and a broad variety of practical exercises for developing productive and receptive skills. Listening to the authentic English sounds, word groups and utterances in the realization of native speakers (from a CD ROM or on-line) can pay dividends. One of the main tasks of this part of the course is to familiarize students with the conventions of the phonemic transcription, to encourage them to have and use a phonemic chart which will help enhance independent learning outside the class room, as well as dictionary work for fostering independence in the learner. Thus, this part can be called “from a sound to a letter”.

The second part of the course is spelling-oriented (from a letter to a sound) and comprises the main rules and exercises on the typical relationships between spelling and pronunciation (vowels and their letter combinations, for example, <e, ee, ea, ie, ei> etc. as /i:/ in the words like *species, peel, weak, achieve, receive*; consonants and diagraphs <ch> as /tʃ/, /ʃ/, /k/ in the words like *chain, machine, chloride*). Such activities as listening and transcribing, reading (alone, in pairs, in groups), imitation and eliciting on the basis of a student’s research papers provide necessary practice in fluent reading, listening comprehension and pronunciation as the students are expected to follow certain patterns of rhythm and intonation in their oral communication, to treat correctly correspondences between a sound and its spelling, to be aware about exceptions (cf: *saccharide, schedule* /ʊsɛδZu:l/ [4]; *arsenic, surface, furnace, bismuth* etc.).

To sum it up, we’d like to emphasize that it is unwise to ignore pronunciation in any language course because pronunciation is not only important for oral communication but it supports other skills: listening comprehension, spelling, grammar, word-stock, and reading. Effective results of teaching, as was proved by our experience, can be achieved by a creative combination of the teachers’ enthusiasm, students’ efforts and information and communication technologies which facilitate the efforts made.

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