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## The Advantages of the Network-based Electronic Teaching Package by the Implementation of English for Specific Purposes Course

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### Abstract

The article analyses the advantages of English for Specific Purposes teaching of the fourth year students majoring in “Electrical and Power Engineering” at National Research Tomsk Polytechnic University by means of the network-based electronic teaching package. This paper analyzes the structural content of the network-based electronic teaching package, shows the key approaches used to develop this tool and focuses on the description of its main components. The conclusions made are based on the results obtained over a three year period (2012-2015) of the network-based electronic teaching package use.

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### 1. Introduction

The implementation of key regulating documents such as Federal programs, Electronic Russia, TPU standards and ESP course syllabus has promoted the rapid development and intensive use of information and communication technologies (ICT) in the educational process. The use of electronic educational resources is one of the dominant trends in the development of modern educational practice in universities and hence, is directly referred to foreign language teaching. The pedagogical experience being gained currently brings out clearly the didactic potential of modern ICT in the intensification of foreign language teaching. There are a lot of publications dedicated to

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methodological didactic functions of many common Internet technologies in language improvement. Podcasts technology provides the development of research skills and learning autonomy (Anikina, 2013); webQuest technology is didactic means to form foreign language communicative competence (Baguzina, 2011), Internet 2,0 technology contributes to conscious activity and self-study promotion allowing to improve and develop students' information and learning competence, as well as all aspects and kinds of verbal activity by using ESP corpora at ESP lessons (Zhuk, 2006; Shishkovskaya, 2013; Sysoyev & Evstigneev, 2011).

It should be noted that the role of electronic resources increases considerably by the realization of ESP course (also called Professional English course). However, the use of specific ICT techniques in the educational process may vary depending on the learning objectives. The main goal of ESP teaching in higher education is the development of students' professional-oriented foreign language communicative competence in its major components (sociolinguistic, discourse, strategic).

The aim of this article is to show technological, didactic and structural advantages of a network-based electronic teaching package (NBETP) developed for the fourth year students majoring in "Electrical and Power Engineering". The experience of NBETP use in the educational process allows us to state that thanks to its potential of advantages the autonomous, individualized, learner-centered character of learning is preserved. The network-based electronic teaching package is a model of a real educational process that organizes the students' and teacher's activity and manages the whole process using the tools of information and education environment.

## **2. Methodology**

The content-analysis of modern scientific research concerning the ICT in teaching a foreign language has allowed us to reveal the shift of emphasis from technical issues to the didactic and methodological aspects of electronic resources use. This fully refers to the network-based electronic teaching package (NBETP). Concerning its functional potential NBETP is a model of a real educational process: it organizes the students' and teacher's activities; is aimed at the management of the whole process using the entire didactic potential of information and education environment and also contributes to update and restructuring of the subject content. Undoubtedly, all mentioned above emphasizes the advantages of NBETP as an effective electronic recourse in the process of ESP teaching.

The experience of scientific development of electronic educational resources and its practical use are reflected in numerous works (Popov, et al., 2002; Zubov, 2009; Titova, 2012; Sharavin, 2004; Kobylskaya, 2008; Kovrizhnykh, 2006; Nechaeva, 2007; Shlangman, 2004). Titova (2012) analyses the theoretical grounds of the development and use of educational-methodological package by the foreign language teaching at non-linguistic university. Nechaeva (2007) investigates the conditions of the intensification of educational- cognitive activities of future specialists using electronic teaching package. The object of research in Sharavin's work (2004) is the organizational-pedagogical conditions of network educational-methodological package use in student's professional training. To ensure the required level of future engineers' general and professional communicative competence Kobylskaya (2008) suggests carrying out the educational process on the base of the problem-based learning with the use of electronic teaching aid.

## **3. Results and discussion**

In spite of the standard requirements to the language training within the framework of the ESP course it is impossible to create one universal course or teaching aid for students majoring in different disciplines and areas of study in a university.

First of all, it can be explained by the specific of the terminology, specialized discipline specific vocabulary particular to their area of study and field. It should be pointed out, that ESP students working within their professional field have very specific and particular linguistic needs in their discourses and documentations. The analysis of professional needs concerning the engineering specialists has shown that only in real professional situations and spoken discourse the use of foreign language becomes a competence important quality of a future engineer.

Secondly, when developing a course it is to be noted that students are drawn from the same background

discipline but with varying levels of English language proficiency according to the Common European Framework of Languages for Reference (CEFR) and other testing systems.

Therefore, to meet the students' needs a special network-based electronic teaching package for ESP teaching was developed. The classes under study were attending the ESP course conducted at a university in Tomsk. There were four groups consisting of 41 students each semester. Since the experiment lasted 6 semesters, 239 students took part in the training by means of NBETP.

The following fundamental guiding question was at the centre of the study: In what ways does the application of the developed network-based electronic package lead to an improved learning experience for students attending ESP course?

The first important advantage of NBETP is its technical potential. NBETP is developed in the Modular Object Oriented Developmental Learning Environment (Moodle). This platform possesses wide range of technological advances and service functions: the unified registration system and users statistic in Tomsk Polytechnic University domain which allows the educators to keep records of certain interactive teaching recourse popularity and monitor the progress in students' study; feedback service which is provided through synchronous and asynchronous means of communication where students can try new forms of learning and self-studying through advanced telecommunications (wiki, chat, conferences, e-mail, discussion (forum), webinar, interactive and graphical chat, questionnaire, seminar, survey); the function of team Wiki texts editing, which allows to save, restore, update the old pages and create and place new pages; test module which enables to monitor and assess students' achievements and progress at each stage of their learning automatically by means of specially-developed tests; multimedia environment like animation digital video, flash-technology and other tools. This multimedia environment includes not only ESP theoretical material but also graphical video and audio-video material.

Thus, the idea to combine the advantages of word processor, e-mail, electronic journals, search engines and other attributes of computer technology widely presented in Moodle with the didactic and methodological potential of the developed NBETP was successfully implemented in the teaching process.

The second advantage of the developed NBETP is the possibility to combine different approaches in the process of its development and use. The major approaches used are: competence approach to education, communicative approach by shaping foreign language professional-oriented students' competence, communicative and activity approach to the teaching process organization, selection and arrangement of teaching material, personality-centred approach to the teaching process organization, professionally-oriented approach to the selection of instructional content, Problem Based Learning concerning self-study and explicit learning which provides transparency and students' awareness.

Thanks to the advantage to combine different approaches: a) modern ESP teaching techniques and new specific of teaching process organization in the information and education environment by means of ICT are taken into account; b) the integration of professional-oriented foreign language teaching in the context of the general vocational training is provided; c) the orientation on the students' personality-creative development is realized; c) the contribution to the development of students' reflection is made.

Next advantage of NBETP is in the variety of purposes and objectives to be achieved. The central purpose of the developed NBETP is to create information and education environment the involvement in which facilitates the increase of the ESP learning process efficiency. Four main problems have to be solved to achieve the mentioned above purpose. They are systemized into four groups in accordance with the criteria of activities. The first group of problems to be solved is the methodological one: the improvement of speaking, reading, listening and writing skills. The second group is aimed at motivation encouragement of students' self-study and independent work both in class and at home. The third group of problems is targeted at shaping of conscious and activity approach to ESP learning. The fourth group of problems centered on self-discipline elaboration facilitates the development of professional reflection.

NBETP structure is the key aspect which offers other advantages when teaching engineering university students. However, to take the advantages some conditions should be met.

The first condition is the combination of electronic recourse with paper teaching aid. Firstly, these two teaching aids (electronic and paper version) supplement each other allowing the selection of the optimal mode and scope of material for classroom and self-study activities. Secondly, the availability of two versions provides rational change

of activity forms to deal with the information both at traditional paper-based lessons and in the in the information and education environment format. It also contributes to the application of new forms of learning and self-study through advanced telecommunications (wiki, chat, conferences).

Moreover, it is possible to save the teaching material to use it in ESP teaching, e.g. at traditional lessons for the instructor or lecturer who conducts lessons but does not have enough ICT skills. The hybrid versions reflect the dynamic of term system development in comparative-contrastive analysis. This analysis is of great importance for the teachers involved in scientific research in the field of linguistics. What is more, the paper teaching aid can be used when some technical problems occur.

Reasonability to use two versions (paper teaching aid and digital multimedia electronic teaching package on the Moodle platform allows the instructor to optimize the ESP teaching by means of integration of several sources of information which supplement each other and interchange of different types and forms of activities.

The second condition to be met is concerned with the necessity to comply with the correspondence principle. It means that the content of the ESP course should reflect the main concepts of students' major, specialty in the field, branch of learning and their needs. It is important to realize that the content of the course is determined by the educational standard and course syllabus. The electronic package has to be, on the one hand, open and, on the other hand, complete. The main tool of this condition satisfaction is the module structure of NBETP. The principle of module structure has been chosen as the leading one in the process of NBETP design and development. This principle is also used in the module organization of ESP teaching. The module arrangement of information allows realizing the openness principle in the NBETP design. The teacher can add new modules and teaching material if necessary, update the old module by adding up-to-date information and new relevant teaching material and delete the inappropriate parts. The use of this principle grants learning autonomy to students. The choice of the module structure is determined by the possibility to keep autonomous and learner-centred character of learning with continuity and interconnection of its stages. Successful achievement of goals and objectives at each stage contributes to the enhancement and increase of professionally-oriented communicative competence at the following stages.

There are different types of modules. Each module type is targeted to achieve certain results. Each type pursues its specific purpose and includes certain objectives. From the variety of modules teaching-thematic one is the most relevant for ESP teaching. Therefore, the teaching-thematic module has been chosen for the NBETP material arrangement.

NBETP consists of two teaching thematic modules "Electrical Engineering Materials" and "Electric Machines and Drive". Each module is made up of units. Module "Electrical Engineering Materials" includes three units and module "Electric Machines and Drive" contains five units. Structural components of each module are: web-page, book, file reference, workbook, lecture, forum, chat, set of exercises, seminar, tests, Wiki and Webinar. Each module is presented by several thematic blocks. Block is an element of a module with a logically-completed structure, aimed at the study of the major and key course concepts, monitoring and self-testing. It also includes some additional video and audio-material. Instructional lines need to be integrated in the NBETP structure to provide students with effective learning strategies to improve their self-learning ability with stable cognitive motivation and psychological readiness for life-long learning which in turn helps them to find the ways of working out problems in the future professional activity of an engineer. The presence of blocks in the module structure of NBETP allows to systemize and put in order the teaching material, thus, simplifying the navigation through the developed NBETP.

Let us consider and analyze the most significant blocks of NBETP.

Professionally-oriented block consists of: the set of authentic scientific-technical texts from different content areas (texts and articles from specialist textbooks, special science journals, encyclopaedias, reference books, students' books and teaching aids); visual materials (lectures, videos, et al.). Professionally-oriented block is, first of all, a source of substantial information from engineering subject areas. Secondly, this block allows the logical arrangement of the teaching material.

The video material block includes: glossary; flash interactive; digital dictionary; video-collection; figures of video description; video grammar; grammar flash tables and set of assignments. Engineering abbreviations and acronyms (e.g., AC for alternating current, EMF for electromotive force and at al.) occur in the engineering register and engineering references so often that they cannot be ignored. Those abbreviations are included in the developed NBETP under a special heading "Abbreviations and Acronyms" provided with special link to the flash video and video collection for better comprehension of their meanings. Highly-technical terminology usually relates to a

particular specialized field and is important because the discipline-specific word lists is aimed at fourth-year engineering students who study their specialist courses and are in a homogeneous class of the same engineering majors when attending an ESP course.

The reasonability to use visual material is determined: by the nonlinear organization of cognitive process by the integration of different sources of information taken from the Internet sites; by the use of authentic authoritative sources concerned with certain professional problems; by the intensification of visualization due to the synthesis of audio-visual information; by the integration and the possibility to use different types and forms of learning activities.

Thus, the presentation of the teaching material in a module structure includes two leading elements: 1) basic knowledge, competences, skills and habits; 2) knowledge and skills of learning strategies and work methods.

The outcomes analysis of the NBETP use has shown its advantages by the solution of wide range of methodological didactic objectives:

- optimization and increase of the teaching density due to the flexibility and combinations of instructional methods: the use of different types of lessons (web conferences, chat and other types of communication with a partner in the real-time and asynchronous mode); adaptation of learning mode through the adjustment of teaching intensity and load; the improvement of test and monitoring methods through the automatic and objective evaluation of the students' progress; the possibility of recoding with the following analysis of students' work
- improvement of the system of the teaching material presentation in different forms: sound, visual, graphic, text and the improvement of the repository and methods to work with the teaching material: search, storage, structuring, and editing
- individualization of education: students' active stand as a designer of their own educational and developmental trajectory with the possibility of self-control of their own actions; the creation of comfortable environment for the students, "immersion" in the information environment without any negative outer impact
- manageability of the teaching process by means of feedback and the enhancement of the distance and coverage of verbal forms of information and interactive communication with the learning environment (e-libraries) and educational community (advisers, partners, teachers, lectures, colleagues) (Popov, et al. 2002) and ease to make changes, update the teaching material and to delete inappropriate data. The teaching material can also be revised and completed by special tasks for underachieving students and for students who make fast progress in their learning performance

#### 4. Conclusion

NBETP is an integral open system of interrelated components possessing a module structure. The arrangement of this module structure is based on certain principles specified from the position of professional oriented competence approach. The module structure of NBETP allows the teacher to carry out the functions of organization, management and monitoring of students' learning activity and progress based on the scientific concepts and to implement the goals declared in the state educational standard and the special course syllabus. From the functional point of view NBETP is a model of a real educational process that organizes the teacher's and students' activity, manages the whole process and "objectifies" (Kitaigorodskaya, 2009) the content of the subject using the tools of information educational environment.

The conclusions made are based on the results obtained in the course of the experiment and the use of the developed network electronic teaching package with 24 groups of fourth year students in National Research Tomsk Polytechnic University over a period of six semesters (2012-2015). In whole, 239 students took part in the teaching process, which confirms, from our point of view, the reliability of the obtained results and the validity of the drawn conclusions concerning the advantages of NBETP by ESP teaching.

The developed package is directly applicable to the engineering students who make a Bachelor degree in the discipline "Electrical and Power engineering" or similar venues having clear needs for English for Specific Purposes as a vital and essential element for their professional success.

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