PROJECT – BASED LEARNING AS AN EFFICIENT INSTRUMENT OF MULTILINGUAL EDUCATION

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To provide technical students with the non-science skills necessary for the global job market is one of the key issues for educators. The global job market requires multidisciplinary knowledge and intercultural teamwork skills; the new global economy calls for specialists who possess the ability to communicate proficiently in the worldwide community. Besides, our students must gain a positive reception for the need to understand other cultures during their undergraduate education. Thus, the role of foreign languages training increases significantly. European education experts pay a special attention to creating more language-friendly environment in European higher education institutions. This paper considers foreign languages training in the context of multidisciplinary education**.** It aims to describe project-based learning as part of multidisciplinary education, and as an extra tool for foreign languages acquisition in an engineering higher school. It also focuses on the internal educational environment resources necessary for supporting project-based learning.

Keywords: educational environment, foreign languages teaching, multidisciplinary skills, project-based learning

1. Introduction

The environment conducive to learning plays a significant role as strategic component in modern education. Besides, European education experts pay a special attention to creating more language-friendly environment in European higher education institutions. The strategic goals for the European Union were set out at the Lisbon European Council of 23 and 24 March 2000, opening education and training to the world being one of them. This goal involves "building the European education and training area through mobility and foreign language teaching on the one hand, and strengthening the links with the world of work, research and civil society as a whole on the other" [1]. In other words, multidisciplinary approach to studies is intended to satisfy the demand for a broad education that will meet the needs of modern Europe of knowledge.

Though the internal educational environment in each educational organization is a unique intellectual community, all educational organizations serve the same purpose – they must prepare their students for the global job market with the need for technical professionals who have additional skills to meet globalization requirements. The global job market requires interdisciplinary knowledge and intercultural teamwork skills; the new global economy calls for specialists who possess the ability to communicate competently in the worldwide community. Therefore, to be competitive in the international job market, engineers must gain a positive reception for the need to understand other cultures during their undergraduate education. In this context, the role of *foreign languages training* increases significantly.

2. Foreign languages training in the context of multidisciplinary engineering education

The efficacy of an educational environment is principally determined by the approach educators use, and the learning methods supported. One resourceful way to provide multidisciplinary engineering education – a crucial aspect of modern society development - is to incorporate *multidisciplinary approach* [2] into academic programs. It is obvious that educators have to re-examine and update academic programs and engineering curricula introducing changes in the content and scope of the different subjects in the curriculum.

Multidisciplinary academic programs represent the convergence of various disciplines. They have stronger ties to the regional, national, and global communities through program content, distance learning, and internship. Multidisciplinary programs are characterized by integration of topics; general subjects - humanities, social sciences, management, *languages* - are incorporated with professional subjects. Since the European Union is home to 450 million Europeans from diverse ethnic, cultural and linguistic backgrounds, it is vital that citizens have the language skills and meaningful communicative competence necessary to understand and converse with their neighbours, to obtain the required information, to make further research in the given area, and to provide mobility across Europe. It is precisely this fact that explains the barest necessity of foreign languages integration into the curriculum, together with multidisciplinary skills.

In this context, increasing coordination of foreign languages training with the objectives and outcomes of the engineering program is a necessity. Grounding of students in a foreign language must be synchronized with studying engineering subjects. The multidisciplinary approach can serve as a common and flexible *platform* for teaching various subjects including English for Specific Purposes (ESP), or English for Science and Technology (EST) as a form of ESP.

For practical realization of the multidisciplinary approach, we can apply both traditional *methods* and new *strategies*, and they must be based on the analysis of our graduates' goals. Some experts draw attention to a few innovative educational strategies that are employed to enhance engineering education: cooperative (active) learning, i.e. engaging students in doing and thinking instead of passive listening [3], wide use of information and communication technologies, project-based learning, etc. We may also combine universal educational strategies with some popular approaches, methods, techniques and models, which are widely used for the practice of the English language teaching. We need such approaches and methods, which will be focused on using particular language forms in a variety of contexts and for a diversity of purposes.

Let us consider a few examples. *The Communicative approach (Communicative Language Teaching – CLT)* to foreign languages training has become popular all over the world; this approach enables teachers to use role-play and simulation in order to engage their students in realistic communication and improve students' communicative abilities. *The Task-based learning (TBL)* involves presenting students with a non-linguistic problem (task) that they have to solve; this strategy can also be rather helpful and efficient; moreover, it "implies a shift away from some traditional teacher roles" [4].

3. Project-based learning as an efficient instrument of multilingual education

One efficient way of introducing innovative educational strategies into the curriculum and providing the acquisition of multidisciplinary skills is to organize multidisciplinary project teams working on some common project, and to make our students (and their teachers) work in close cooperation. This process requires the integration of various skills. Project-based learning takes several forms: in-class activities and out-of-class activities, with teams solving either everyday homework problems, or working on complicated projects. Through project-based learning engineering high schools can develop new knowledge and skills, and to provide their graduates with teamwork experience.

Working in partnerships within teams and sharing multidisciplinary knowledge students master their professional skills, presentation skills, communication skills, managerial skills, teamwork skills, problem-solving skills, computer skills, as well as their language skills. In other words, we build up the whole set of multidisciplinary skills necessary for technical professionals today for solving multidisciplinary problems. Students are also exposed to some ethical questions, so we try to develop their awareness of social, professional and ethical responsibility. Besides, developing the project students can put their knowledge into practice – they create a system, e.g. a video clip, a short movie, a Web site.

Making students perform concrete tasks in pairs and groups is common for foreign languages training; this practice stimulates cooperation and knowledge exchange amongst learners and it encourages individual learners to talk more. We can give our students a good chance to integrate their knowledge of different realms. As for the problem itself, current events can be an inspiration for students, for example, global warming, rapid innovations in telecommunications and information technology, increased international cooperation, multicultural society formation, new career prospects, etc. The learning goal is to obtain some knowledge about the subject matter and to stimulate reasoning and information interpretation.

When a multidisciplinary project is organized by foreign language teachers, it results in the specific character of the project. Initially, the problem is formulated in a foreign language. Working on the project students have a chance to use their language skills and improve their linguistic competence employing various information resources and the equipment, communicating and exchanging their views and opinions on the given problem, designing their presentation and preparing their commentary (Fig. 1).

To effectively realize the project, project teams are usually given a week for working toward the established objective. The team's final oral presentation in a foreign language supported by a computer presentation resembles a design presentation to an imaginary company's board of directors, or a formal presentation at an international conference/contest.

Teachers of special subjects help students prepare the project in cooperation with teachers of general subjects and the attending staff, and in the process use the integrated resources of the educational institution.

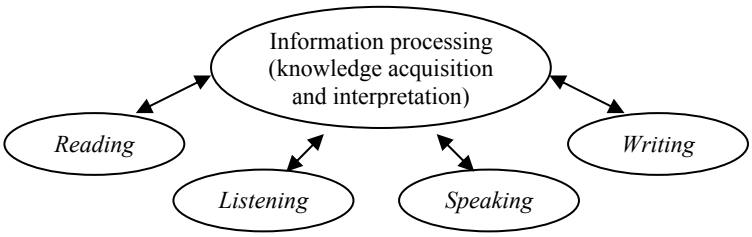

Fig. 1. Working on a multidisciplinary project: developing four basic linguistic skills

The purpose of the annual project week is to prepare students for the changing global workplace, where multidisciplinary teams are common, and to simulate a collaborative team environment, where students with diverse backgrounds can work together to achieve common goals, at the same time *promoting language learning*.

4. Highly integrated educational environment as the basic prerequisite for project-based learning

However, without creating a flexible, learner-centered, and highly integrated educational environment, where we might apply some progressive pedagogical techniques and management tools, all our efforts will be unavailing.

The environment is of primary importance to the success or failure of any project. The development of multidisciplinary projects requires some fundamental management skills to operate in the internal educational environment. To be effective education managers must have a clear understanding of their environment, how it affects their work, and how they can influence and modify it.

The internal educational environment is not a collection of separate segments, but a complicated system. Its subsystems are interdependent, and function together to achieve a common goal. Tight integration between the internal environment components is the basic factor that allows educators to use all internal resources of the organization successfully. The integrated educational environment provides the necessary resources for supporting project-based learning:

- Material resources
  a) *Physical environment units* (buildings, premises, classrooms, financial resources)
  b) *Technological environment* - laboratory equipment, computer networks
- Human resources (managers of all levels, teachers, attending/supporting staff)
- Instructional environment (regulative documents, academic programs, curricula, teaching materials).

The interaction between the internal environment subsystems is essential to distributing the existing resources to the greatest benefit for all learners. In the educational environment, it is vital to maintain collaboration in the system as "a synergistic response to present conditions" [5]. An integrated and well-coordinated educational environment is always a learner-centered system aimed at better collaboration between the learning process participants. The collaborative environment makes it possible to fiddle the instruction with students' needs. Thus, the highly integrated educational environment stimulates project-based learning providing access to the full richness of resources, thus ensuring effective and coordinated learning opportunities for all students to acquire a variety of skills.

The highly integrated educational environment is also appropriate for project-based learning, since it allows cohering knowledge among subjects (Fig. 2). As a result, the integrated educational environment provides the basis for the learning process that encourages continual progress through the improvement of the multidisciplinary skills, which students are able to acquire.

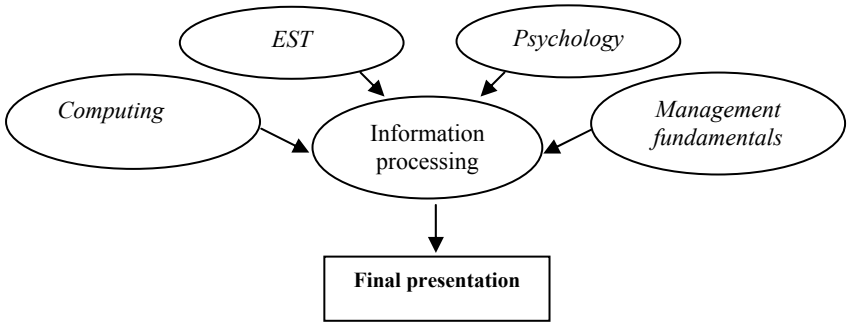

Fig. 2. The interdisciplinary nature of the incorporated educational environment: subjects integration

We supply students with structural knowledge, which presupposes not only the ability to identify, digest and use the necessary information; the expected learning outcomes include the ability to process this information, to put knowledge into practice, design something, etc.

The questions that some experts ask are: "*How is a student integrated into the educational environment? What are the tools, which help young people get integrated into the environment?"* [6]. We suppose that we can do this by using as innovative education strategies, as a set of universal management tools.

From the managerial aspect, organizing students in multifunctional and self-managing teams we help students to get integrated into the educational environment through:

- Planning and managing their time and work
- Understanding their contribution to the learning process
- Using the internal and external environment resources, searching for necessary information, solving more complicated problems and making decisions
- Communication at various levels (inside and outside the team) - with classmates and teachers, with people in power and authority (the Institute's administration).

For completing the project educators have to guarantee the necessary support from the internal educational environment. To effectively realize the project goal, we require effective cooperation among the people involved in the project – the people from different organization levels. The chain looks like this: *Education managers provide the necessary resources → Teachers and supporting staff make these resources available for students → Students being team members learn how to use these resources effectively, and coordinate the resources and the work of others (managers and teachers "pass" their functions to students).*

Consequently, the teacher is no longer "a talking head", but a manager and coordinator of the educational environment resources and the student's activities; his role is to assist the learners in constructing their own knowledge. In turn, learners are no longer expected to be passive recipients of knowledge. They are provided with the opportunity to acquire the ability to explore and investigate, to reason and ground, to use knowledge in practice. Inside the highly integrated educational environment, educators at all levels enter the realm of management; this is how the convergence of two domains – the educational domain and the management domain - becomes a reality.

5. Conclusion

From a pedagogical perspective, engineering education means providing students with the opportunity to acquire the basic professional skills, as well as multidisciplinary skills required to keep pace with constant changes in global community. There is also a sturdy demand for foreign languages integration into the engineering curriculum, since it is vital that our graduates possess good language skills and sufficient communicative competence necessary to work and compete in the knowledge-based society.

From a management perspective, engineering education means using some fundamental management principles in organizing and directing the activities of the learning process participants aimed at providing students with the opportunity to obtain the necessary skills.

The learner-centered environment will maintain the efficient performance of an educational institution making the full richness of resources to support the learning process. At all levels of the educational environment its components (resources) are interconnected and interdependent. The integrated educational environment stimulates students' ability to learn and develop themselves; it is a prerequisite for the multidisciplinary education model realization. The multidisciplinary approach can provide a platform for teaching various subjects including English for Specific Purposes (ESP), or English for Science and Technology (EST) as a form of ESP.

The multidisciplinary education model enables educators to use a wide assortment of modern learning techniques for developing multidisciplinary skills. One efficient method of introducing some novel educational strategies into the curriculum and providing the acquisition of multidisciplinary skills (including language skills) is to arrange multidisciplinary project teams working on a certain project, thus making students and their instructors work in cooperation, sharing knowledge and constructing new knowledge. A multidisciplinary project organized by foreign language teachers will require an integration of language skills, computer skills, management skills, problem-solving skills, communication skills, etc.

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Stukalina J. UZ PROJEKTU ORIENTĒTĀS MĀCĪBAS KĀ IEDARBĪGS INSTRUMENTS MULTILINGVĀLĀ IZGLĪTĪBĀ

Būtisks faktors, kas pašlaik ietekmē moderno sabiedrības izglītības sistēmu, ir globalizācija. Visbūtiskākās pārmaiņas tehnisko speciālistu sagatavošanā ir saistītas ar globalizācijas tendenci pasaulē. Pārmaiņas Eiropas izglītībā ir veicinājušas akcentu pārnesi uz katra cilvēka nepārtrauktu personības attīstību, un uz viņa konkurētspējas nodrošināšanu globalizācijas un starptautiskā sadarbības kontekstā. Globalizācija rada kā jaunas iespējas, tā arī jaunus izaicinājumus. Uz zināšanām balstītai sabiedrībai ir vajadzīgi profesionāli ar lieliskām tehniskām iemaņām un daudzdisciplīnu prasmēm. Ņemot vērā iespējamās globalizācijas sekas, izglītības eksperti var izmantot jaunas pedagoģiskas metodes, ieskaitot starpdisciplināro pieeju. Tas ļauj viņiem apvienot vienā kopumā dažādu disciplīnu metodes un līdzekļus. Starpdisciplinārā pieeja izglītībai nozīmē profesionālo priekšmetu integrāciju ar vispārizglītojošo priekšmetus – svešvalodas, humanitāro un sociālo zinātnes. Viens no efektīviem instrumentiem daudzdisciplināro izglītības kontekstā ir uz projektu orientētā apmācība.

Atslēgas vārdi: mācību vide, daudzdisciplīnu prasmes, uz projektu orientētās mācības

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