Scientific and Educational Project "IT-OSVITA" as a Part of the Training System of Specialists for the Needs of IT Industry of Ukraine

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Abstract. The current development stage of the Information Society is constructing a new mission for education and a significant increase in the requirements for the training of specialists who are capable of self-realization and continued education throughout their life. The objectives of the education systems are to improve specialist training in information and communication technologies (ICT), as well as widespread implementation of ICT in teaching and learning processes, increasing the attractiveness of education and strengthening relations with the professional world. The task of educating personnel who are able to develop new information technologies (IT) and use them effectively in practice becomes strategically important. It is necessary to develop a national system of education in the IT sector, which will be in demand by the science and practice, to solve the problem. This article describes the conceptual approaches to forming an effective mechanism of interaction between secondary and higher education institutions and the main priorities of IT companies in Ukraine, which are based on the experience and recommendations of international and domestic organizations that specialize in modeling the organization of the education process in educational institutions specialized in preparing professionals for ensuring the needs of the IT-Industry in Ukraine.

Keywords. IT specialists, the problems of training, the mechanism of interaction between secondary and higher education institutions and IT companies in Ukraine.

Key Terms. Cooperation, Knowledge Transfer, Development, Deployment, Management, Industry

1 Introduction

The movement of humanity to the Information Society is gaining an increasingly rapid and revolutionary character. Especially rapid and noticeable changes are in the field of ICT. This fact leads to the state where the existing forms and methods of training in this area do not correspond with modern requirements and need a fundamental transformation. The key principles and strategic direction of this transformation should be the maximal approach of the education process to the requirements of the IT industry [5].

Training for the IT sector In Ukraine is realized by more than 250 higher education institutions of various forms of ownership and levels of accreditation. Before 2010, training for IT fields was carried out in 19 specialties and the degree levels offered were bachelor, specialist and master in accordance with the list of directions and professions training, approved by the Cabinet of Ministers of Ukraine May 24, 1997 № 507 "About the list of directions and professions, which are exercised in universities on the appropriate education and skill levels."

The changes that have occurred in the IT sphere, the needs of the labor market and the propositions of higher education institutions were taken into account during the forming of a new list of directions entitled “The List of Specialties” which was approved by a resolution in August 27, 2010 № 787 "About the approving of the list of specialties, which are training specialists in higher education institutions for education and skill levels of specialist and master ").

The contents of IT sector training in Ukraine is harmonized with international recommendations of Computing Curricula adopted by the European and American scientific communities for the quality of training of IT professionals. Industry standards of higher education, which were developed and approved during 2009-2011, also generally correspond to international recommendations and educational programs of leading universities.

Institutions of higher education turned out 24465 personnel with higher education in the IT sector in 2011.

However, today domestic IT companies are experiencing an acute shortage of qualified IT professionals, especially in the public sector. According to the survey of the scarcest professions in Ukraine in January 2012, which was conducted by the International Personnel portal hh.ua, 6 out of ten jobs are programmers.

Therefore, the roundtables on the topic “The prospects for the IT industry in Ukraine” (speakers: Head of State agencies on Science, Innovation and Information V. Semynozhenko, the Chairman of supervisory board Octava Capital A. Kardakov, vice-president of the Association "IT Ukraine" I. Lisitsky, GD of "Microsoft Ukraine" A. Shymkiv) and "IT Education in Ukraine" (speakers: Head of State agencies on Science, innovation and Information V. Semynozhenko, Director of Business Development Ltd. "Infopulse Ukraine" O. Nehoda, the Head of administration of educational work of V. Dale East Ukraine University T. Morozova, Vice President of "Lyuksoft" D. Kushnir, director of Kiev Lyceum of information technology number 79 G. Lomakovska) were held on the initiative of the leading IT companies of Ukraine in 2010-2011.

The question about the preparation of highly professional staff who are able to develop new IT and effectively use it in practice was considered at a meeting of the

Government on September 21, 2011, in which Resolution "On approval of a plan to ensure the development of education in information technology in 2013" was adopted.

The working meeting of The Prime Minister of Ukraine, M. Azarov, with heads of Ukrainian educational institutions and representatives of associations of industry and leading IT companies in Ukraine, took place in February 2012.

In the network of initiatives and activities cited above, questions were considered concerning the level of student preparation in physics and mathematics, the development of programs and courses in information and communication technologies which are studied according to the choices of secondary school students, the establishment of profiling schools in leading universities, development of an effective mechanism of interaction between secondary and higher education institutions and IT companies in Ukraine in terms of training and the linking of market needs with education.

The development of secondary and higher education in Ukraine in order to ensure the IT industry has enough highly qualified personnel requires the development of an efficient mechanism of interaction between secondary and higher education institutions and IT companies in Ukraine. Close cooperation between secondary and higher education institutions, business structures and ensuring feedback from IT businesses become of particularly great importance in this context.

The purpose of this article is to describe the strategies and programs for implementation of effective models of the education process in general education that meets the modern social order concerning the training of specialists for the needs of the IT industry in Ukraine.

2 Review of the Science and Pedagogy Experiment "IT - Education"

The examination of the training process of future professionals shows the social order is considered to be a set of demands that society makes for education in the area of intellectual work and information technologies, among which the demands with particular importance are [6]:

- Ability to be inventive and think critically;
- Universal system knowledge, high adaptability and self-development;
- Key competence in the field of ICT;
- The ability to make decisions, and social responsibility;
- The ability to manage dynamic processes and to work with the project;
- Experience in team- work, high productivity.

The scientific and pedagogical experiment "IT - Education" was launched by the initiative of Taras Shevchenko National University of Kyiv together with the Association "IT Ukraine" and Incom Company on the base of the Lyceum of Informational Technologies № 79 in Kyiv and it provides for the beginning of junior programmer training at high school.

The main methodological features of the project were defined in the network of project "IT – Education". It found that it's main goal is to develop a new model of the educational process of training to meet the needs of the IT industry in Ukraine. The

basis for achieving the above objective is the interaction between institutions of secondary and higher education and employers of the IT - industry.

The concept of the science and pedagogy project "IT-education" was developed to achieve the above mentioned objective. In the content of the concept which is based on analysis of current training for ensuring the needs of the IT industry in Ukraine, substantive features of the problems arise and require immediate resolution. It was determined that achieving the defined goals of the project would require that the basic, strategic and priority objectives should include: increasing the quality of education in the context of psychological and vocational guidance of youth starting from secondary school and preparing students to be motivated in their selection of and training for mastering the specialty in the IT field during the learning process at the institution of higher education.

According to the order of the Ministry of Education, Youth and Sports of Ukraine on the terms of the experimental implementation of the Project, the following main stages of its implementation were defined. Phase I - June - August 2011 – the development of normative and legal support and the diagnostic study of the Project. Stage II - September 2011 - December 2012 – The development of education and logistics. III stage - installation of the training subjects (students, teachers, professors) at secondary schools and higher education institutions to perform tasks of psycho-educational training of IT experts (specialists). But, taking into consideration the fact that the task of each phase (as a result of the impact on the progress of the Project) is interconnected with each other, their execution was carried out comprehensively during the school year, and generally aimed at addressing the following main tasks:

- To develop organizational support for the project;
- To develop teaching resources of the project
- To develop a diagnostic system of ensuring of the project;
- To develop a technical and material method to ensure implementation of the training of subjects (students, teachers, professors) to perform tasks of technological, educational and vocational training (learning) for the future IT experts in higher education.

The evaluation of results of the II phase of the experiment was conducted in the form of vocational testing through the method of Madzhelano University. This has provided the ability to obtain statistical data which objectively characterizes the effectiveness of the educational process and dynamics of the intellectual activity of students of the experimental class of Lyceum of Informational Technologies № 79 in Kyiv. Professional orientation test has shown that the ability of students meets the professional interests and children have chosen the right direction in their future profession (fig. 1, 2).

According to the semantic features of the above-stated objectives and purpose of the project the following principles of its implementation were developed:

- The determination of normative conceptual state documents on education and the needs of the IT network for specialists of this profile;
- The Identification of stakeholders on the objectives of the project;
- The definition of criteria of evaluation and the summarizing of the results of the project's realization;
- The definition of the common business activities of the project;
- The determination of the management process of the project;

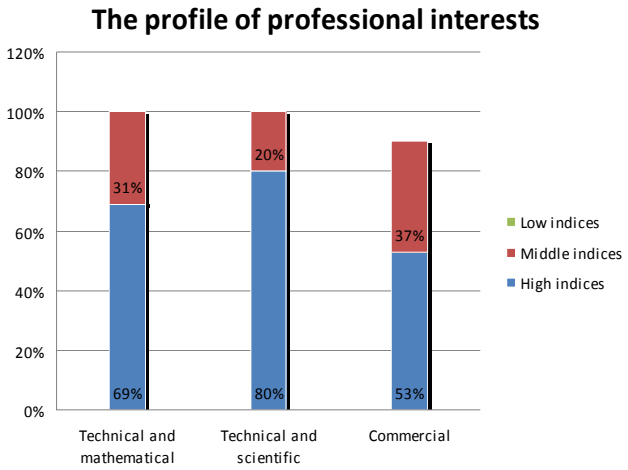

Fig. 10. The results of the test on the profile of professional interests.

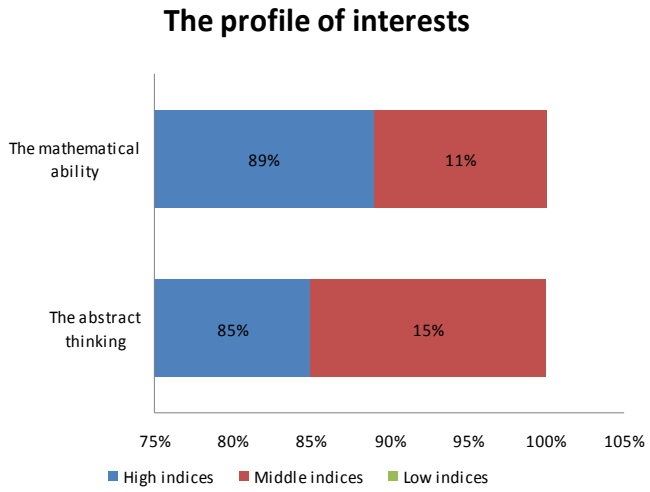

Fig. 11. The results of the test on the profile of interests.

– The definition of the training system as a subject of the project’s realization;
– The definition of quantification and semantic features of the results of the project.

According to the program of the science and education project "IT-education" for the 2011-2012 school year, in the context of activities and tasks a normative and legal standard was developed ensuring:

– Agreements with project participants were prepared and signed;

- A draft order was prepared that was aimed at implementing a research and educational project which is instilled into the form of the order of Ministry of Education, Youth and Sports of Ukraine 20.02.2011r. № 831 "On introduction of scientific-pedagogical project" IT Education";
- A concept of the science and pedagogy project was approved by the above order of 20.02.2011r. № 831;
- The composition of the science and education project coordinating council was created and approved;
- The site of the project (it-osvita.com.ua) was created;
- The discussion of seminar topics for the specialized training of teachers LIT number 79 KNU and teachers who are involved in the experiment was realized.
- Training and educational support for the objectives of IT Education was developed, especially:
- The programs of special courses "Algorithms and programming", "Fundamentals of Project Management", "Introduction to the profession", "IT Ukraine", "English for IT industry" were compiled;
- A register of methodological and didactic materials for the above training courses, which will be consistently replenished according to the needs of students and teachers of Lyceum, the KNU was created;
- A system of activities to promote the objectives of the project "IT-education" was implemented.

3 Conclusions

The effectiveness and quality of the training of professionals to meet the needs of the IT industry in Ukraine can be achieved only within a complete model of the educational process based on the interaction of education, science and business. The model should include a vision of educational outcomes (sets of substantial knowledge, specific skills and competencies), support systems (standards, curricula and methods, evaluation skills, learning environment), the mechanism of interaction between schools and universities with employers at all stages of study.

It should be noted that investments in the status are more attractive to businesses and the IT industry is more interested in increasing of the number of qualified graduates and in compliance with the reorganization of the educational process in the sector of IT education and improving its quality.

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