INNA PODODIMENKO
Postgraduate student of Khmelnytsky National University
Address: 11 Instytutyska Str., Khmelnytskyi, 29016, Ukraine
Phone: +38 096 909 68 45
E-mail: pododimenko@hotmail.com

THE ROLE OF PROFESSIONAL SOCIETIES IN THE PROFESSIONAL FORMATION OF SPECIALISTS IN COMPUTER SCIENCES: EXPERIENCE OF JAPAN

ABSTRACT
The most urgent problem of training competitive specialists in higher educational establishments in the conditions of socio-economical dynamics of transformation of Ukraine and its entry into the world society has been considered. On the basis of professional requirements’ analysis the row of contradictions and disparities among the specialists in computer sciences in the current conditions of swift development of informative society has been traced. It has been stated that labor market growing demands, rapid technological changes require the use of the competency-building approach to future IT specialists for improving their professional level. The process of professional formation of a specialist in the context of modern theoretical-methodological principles has been comprehensively characterized. Peculiarities of leading Japan professional associations of specialists in information technologies activities in the aspect of assisting continuity and consistency of professional formation of experts in computer sciences have been defined. Special attention has been paid to the importance of creative analysis and implementation of foreign experience in the specialists’ training for the professional activity in the sphere of information technologies on the territory of Ukraine. Directions for upgrading higher education in our country and the prospects for subsequent research of the professional training practice of specialists in computer sciences have been outlined.

Key words: vocational training, professional formation, professional associations, specialists in computer sciences, certification, professional standards.

INTRODUCTION
The realities of the present put forward fundamentally new requirements to the professional training of skilled engineers in industry of information communication technologies of corresponding level and profile, competitive, competent, who freely own the profession and are oriented in contiguous industries of their professional activity, are ready to the permanent professional increase, social and professional mobility, are apt to critical thinking and reflection, who can see the alternative ways for solving formulated tasks and are able to overcome stereotypes.

The contradictions between the requirements of the labour market in the conditions of global competition and the real state of specialists in computer sciences training predetermine the necessity of intensification of the process of their professional formation, that must be examined in the context of solution of professionally important tasks which gradually become complicated and assist the specialist to acquire the necessary complex of professionally meaningful business, interpersonal, communication, skills and moral values, etc.
The theoretical analysis of scientific works shows that the problem of the professional formation of specialists in computer sciences on the principles of positive ideas of Japan’s experience has not been investigated and developed in theoretical and practical aspects on the appropriate level that makes this problem rather urgent.

**THE AIM OF THE STUDY**

To examine the peculiarities of Japanese professional societies for the promotion of continuing and successive professional formation of specialists in computer sciences on the basis of the thorough investigation of Japan’s experience.

**THEORETICAL FRAMEWORK AND RESEARCH METHODS**

T. Kudriavtsev considers the professional formation as protracted process of the development of personality from beginning of formation of professional intentions to complete self-realization in professional activity, where the professional self-determination comes forward as a central link (Кудрявцев, 1983). Also, the scientist considers that the professional formation is not a brief act that embraces only the period of study at higher educational establishments. It is a dynamic, multilevel process that consists of four basic stages (appearance of professional intentions; professional education directly; process of active entering into profession; complete self-realization of personality in profession). The transition to every next stage is based on the previous one and accompanied by the formation of a row of contradictions and crises peculiar to a person.

According to E. Zeer the professional formation, being an “intermutation” of personality, adequate to the requirements of professional activity, admits the use of the totality of receptions of social cooperation of personality, its inclusion into the various professionally meaningful types of activity. Such approach to the understanding of the process of socialization allows to say that the personality in this process must change in such a way that answers the requirements of professional activity (Зеер, 2007).

The attempts to describe the process of professional formation and its stages are found also in works of V. Bodrov, A. Derkach, Ye. Klymov, S. Maksymenko, A. Markova, L. Mitina, N. Samoukina, V. Shadrivov, T. Shcherban, D. Siuper, V. Zazykin et al. In particular, Ye. Klymov classifies the stages of the professional formation thus: the optation is a period of choice of profession in educational-professional establishment; the adaptation is an entering into a profession and adaptation to it; the phase of internal is an acquisition of work experience; the mastery is a skilled execution of labour activity; the phase of authority is an achievement of high professional qualification; the tutorship is a passing over the experience by a professional (Климов, 1996).

The important place in the professional formation of specialists is occupied by professional associations. The scientific works of M. Dmytrov, S. Golova, V. Metelytsia, O. Petruk, L. Shatkovska, H. Yamborko are devoted to the role of native professional organizations in the training of competitive specialists in the current conditions of the labour market.

The study of foreign experience acquires great importance for the training of highly skilled, competitive specialists in the conditions of globalization and integration processes. The problems of the professional training of specialists abroad are investigated in the researches of Ukrainian scientists in comparative professional pedagogics such as N. Bidiuk, T. Desiatov, K. Korsak, T. Koshmanov, V. Kovalenko, N. Patsevko, L. Pukhovska, A. Sbruieva, B. Shunevych, N. Sobchak et al. Recently a number of searches of native researchers, in particular O. Ozerska, N. Paziura, T. Sverdlova, L. Tsarova, about possibilities of the creative use of progressive ideas of Japanese experience increased greatly.
RESULTS

According to the Japan Directory of Professional Associations (JDPA) in the category “Computer & IT”, more than 140 professional associations, societies, unions, etc. are listed (Japan Directory of Professional Associations – JDPA, 2013).

In the context of our research the special attention has been given to the Information Processing Society of Japan (IPSJ) which since the time of its foundation in April 1960 has been a leading authority in technical areas of information processing and computer science for professionals and students (Information Processing Society of Japan (IPSJ), 2013). As of March 2011 IPSJ has 17,226 members (including Honorary); 2,448 students; 255 supporting members. IPSJ will provide a leadership for sound evolution of the computer science and technology in an increasingly computerized society and will contribute to creation of new ideas to cope with the accountability for evolving information technology. IPSJ promotes development of the arts, sciences, industry, and humanity through conducting various activities about information processing with computers and communications and providing resources for discipline and opportunities of cooperation with sister societies to members.

To main activities and services of the society belong the following:

– the publication of periodicals (Journal of Information Processing (JIP), IPSJ Transactions on Bioinformatics (TBO), IPSJ Transactions on Computer Vision and Applications (CVA), IPSJ Transactions on System LSI Design Methodology (TSLDM), IPSJ Magazine “Joho Shori”);
– the organization and holding of conferences, discussions where the participants work in sections according to their scientific and professional interests (the Special Interest Groups);
– the organization and holding of symposiums and topical seminars where specialists have the opportunity to exchange their professional experience, upgrade their level of qualification, arrange professional cooperation;
– the holding of the annual National Convention and Forum on Information Technology (FIT) co-sponsored by the Institute of Electronics, Information and Communication Engineers (IEICE);
– the support of programs of certification and accreditation of specialists in computer sciences in accordance with the existing professional standards
– the study of principles, curricula, methods, and estimation for improving education quality of training of specialists in computer sciences in accordance with the existing professional standards;
– the development of drafts of international standards, drafts of Japanese Industrial Standards and so on subject to contract for international standardization of information technology with Japanese Industrial Standards Committee;
– the donation of prizes to members for their outstanding papers, presentation, and contribution in information processing fields (IPSJ Contribution Award, IPSJ Best Paper Award, IPSJ Nagao Special Award, IPSJ Yamashita SIG Research Award, FUNAI Achievement Award, IPSJ Kiyasu Special Industrial Achievement Award, Specially Selected Paper);
– the co-sponsorship of various symposiums and tutorials with organizations under Science Council of Japan and Japan Federation of Engineering Societies to provide members with state of the arts of different fields and give them opportunity for upgrading the professional competence in the framework of cooperation among the representatives of allied professions;
– the co-sponsorship with IEEE, IEEE-CS, ACM, KIISE and other organizations for computer science and technology to provide its members with chances of overseas cooperation;
– the conducing of research activities and services depending on the work plan of eight regional sections.

It should be noted that in 2008 IPSJ announced the Computing Curriculum Standard J07 as a guideline for college level IT education which is based upon the U.S. academic standards Computing Curricula 2005 (CC2005) but takes into account the differences in national and cultural peculiarities between countries so that the terms and graduate qualities are described using different terminology due to the requirements of country and region.

In June 2013 Information Processing Society of Japan (IPSJ) announced the proposal of the advanced certification system for information technology (IT) engineers Certified IT Professional System which aims at visualizing the competence of IT engineers, providing their advanced professional performance for building a professional community of skilled certified IT engineers so far as the certificate is an objective designation to assure that specialist has abilities and skills necessary for performing professional duties at high level in accordance with the modern requirements of the labour market.

The Certified IT Professional System is based upon the Skill Standards for IT Professionals (ITSS). As approximately 90% of large enterprises and over 60% of SMEs use the recommendations of ITSS, we have the reasons that confirm that ITSS is being effectively utilized as an indicator for both the professional upgrading and self-development of specialists in IT industry and the outline future respective for the development of enterprises and companies.

Of the seven levels defined in ITSS, the certification system is intended for advanced engineer of level 4 or above, which is compatible with SFIA level 5 or above. Based on the evaluation method defined in ITSS, IPSJ issues certification to the engineers who are judged to have competence of the target level, have appropriate education and work experience. Besides this the certification system uses the data of the Information Technology Engineers Examination (ITEE) which allows impartially assess the level of professional competence of IT engineer.

The rapid progress in the development of IT sector requires IT engineers to acquire new knowledge and skills continuously so that the renewal of a certification with continuing professional development is mandatory in recent international standards and has an effective period of three years. IPSJ will have a trial of validity of Certified IT Professional System with the cooperation of such companies as Toshiba Corporation, Hitachi Ltd., Fujitsu Ltd., Mitsubishi Electric Corporation, NEC Corporation, Nippon Telegraph and Telephone Corporation and their subsidiaries.

The Information Technology Promotion Agency (IPA) (established in 1970, restructured in 2004) aims to assure the security and reliability of social IT services and systems, strength international competitiveness, cultivate highly skilled world-class IT human resources (IPA Information Technology Promotion Agency, Japan, 2013). According to the later, JPA: 1) created standards to measure IT engineer expertise (Embedded Technology Skill Standards (ETSS), Skill Standards for IT Professionals (ITSS), mentioned above, Users’ Information Systems Skill Standards (UISS), which are the framework both for the continuing professional development of competitive IT human resources and the Information Technology Engineers Examination (ITEE); 2) outlines the future perspective for the professional training and development of competitive IT specialists in the framework of program “Industry-Academia Partnership for Human Resources Development” with the effective collaboration of higher educational establishments and leading experts in the field, potential employers; 3) discovers and cultivates outstanding IT human resources on the
basis of such projects and programs as “Exploratory IT Human Resources Project” (The MITOH Program), “Security Camp”, “New Enterprise Support Organizations” and others.

The Institute of Electronics, Information and Communication Engineers (IEICE), which history has begun in 1911, today has more than 34,000 members, among them approximately 3,300 are the representatives of Europa and Asia, Africa, North, Central and South America, Oceania (IEICE Website, 2013). The structure of IEICE includes 10 regional sections, Standards Committee, Engineering Sciences Society (ESS), Communications Society (CS), Electronics Society (ES), Information and Systems Society (ISS), Human Communications Engineering Group (HCG). The membership in the IEICE allows scientists to publish their papers in internationally approved scientific journals, discuss with colleges and upgrade their professional level by participation in international conferences, symposiums, tutorials, monthly Technical Group meetings, etc.

The Robotics Society of Japan was founded in 1983 for the purposes of promoting progress in academic fields and providing specialists with a venue for announcing their research and exchanging technical information by publications in society’s journals, participation at conferences, symposiums, workshops, etc. and cooperation work at specialized research committees.

The Japan Society for Software Science and Technology (JSSST) was established with aim to stimulate the cooperation among the specialists for the solution of different problems concerning quality improvement and development of new software, conducting of research on artificial intelligence, software engineering and so on in different research groups (there are 7), publication research results in scientific journals, receiving necessary consultations, exchange the experience and ideas on lectures, conferences, tutorials and other activities.

For the promotion of international scientific collaboration the Japan Society for the Promotion of Science (JSPS) fosters high skilled researchers from all over the world to conduct cooperative scientific and research activities at Japanese universities and research institutes. JSPS suggests 5 different types of programs for PhD (standard, short-term, summer, strategic, program with further teaching at Japanese universities). Besides this there are more than 50 programs in 8 different directions which is the substantial platform for the professional formation of specialists and development of science in the terms of international collaboration.

CONCLUSIONS

On the basis of analysis of the role of Japanese professional societies in the aspect of professional training of future specialists in computer sciences we can assert that such organizations directly influence the professional formation of IT specialists by the preparation of the educational qualification programs and conducting of qualification examinations; the conducting of qualification examinations and certifications of specialists in accordance with the established professional standards; the development of drafts of legal documents concerning both profession and industry; the co-operation with international and world field organizations for the activation of exchange of the experience; the organization and holding of conferences, workshops, lectures, scientific discussions, presentations, forums, collaborative research projects which assist to the development of scientific potential of specialists and increase of their professional competence; the development of the requirements for the specialists of the industry of information communication technologies; the control of the observance of ethics and professional code for specialists in computer sciences and so on.

The multidimensional scale of the problem of training highly skilled competitive specialists in computer sciences is acknowledged at the state level in Ukraine and in the world. The analysis of the maintenance of training Bachelors of Computer Sciences at the
universities of Japan testifies the presence of positive achievements and is noteworthy for the creative use and implementation into the native educational practice. Therefore the perspective for subsequent scientific research is considered in the improvement of professional training of Bachelors of Computer Sciences in the native system of higher education by the implementation of progressive ideas of the experience of Japan.

REFERENCES