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Didactic peculiarities of bachelors of computer science training at the higher educational establishments of Japan

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Abstract. The improvement of quality of the specialists training at the establishments of higher education is currently the main priority of the modern state policy of the government of Ukraine concerning issues on education. There is a question of combining of the old and new forms and methods of training organization. On the basis of the analysis of the original monographic literature of Japanese and foreign scientists the peculiarities of organization of bachelors of computer science professional training in the system of higher university education of Japan are distinguished. It is established that in pedagogical process along with traditional methods and forms of teaching, such as lecture and others, the new ones become rather interesting, such as method of field study, design method, method of distance creativity, method of cooperated teaching. It is emphasized that the choice of forms, methods, facilities of teaching and educational techniques at the universities of Japan is focused on the problematic of teaching-learning process, analytical, reflective and creative activity, development of student's personality as a future highly qualified specialist and citizen. The attention is focused on the role of teacher in the modern conditions of educational process. The importance and need of the implementation of progressive ideas of foreign experience concerning the training of bachelors of computer science in the practice of native higher education is stressed. The prospects for further research concerning the training practice of specialists in this field of knowledge have been outlined.

Keywords: forms of teaching, teaching methods, interactive teaching techniques, bachelor of computer science.

Introduction. According to UNESCO, higher education has given ample proof of its viability over the centuries and of its ability to change and to induce change and progress in society. Owing to the scope and pace of change, society has become increasingly knowledge-based so that higher learning and research now act as essential components of cultural, socio-economic and environmentally sustainable development of individuals, communities and nations. Higher education itself is confronted therefore with formidable challenges and must proceed to the most radical change and renewal it has ever been required to undertake, so that our society, which is currently undergoing a profound crisis of values, can transcend mere economic considerations and incorporate deeper dimensions of morality and spirituality [9].

In the conditions of paradigm change of modern higher education in Ukraine the need in comprehension and introduction of the progressive ideas of foreign experience of the highly developed countries in the aspect of competitive specialists training, in particular bachelors of computer science, in accordance with the modern requirements of labour market, has become of great importance in recent years. In such a case the accumulated experience of foreign colleagues should be taken into account for reforming not only the content and structure of native higher education but also for improvement of already existing and development of new forms and methods of training.

In accordance with it, the experience of Japan presents considerable interest for pedagogical public of higher educational establishments, as both high economic and intellectual development of nation testify the efficiency of Japanese system of education. The upgrading of teaching quality in the didactics of higher education of Japan is fulfilled mainly by permanent modification and improvement of the academic programs, revision of traditional teaching forms and methods, increase of complex of the newest technical equipment, wide use of new unconventional forms of training organization.

The aim of the study. To reveal and substantiate the peculiarities of implementation of new and traditional forms and methods of bachelors of computer science training in the pedagogical process of higher educational establishments of Japan.

Theoretical framework and research methods. Many researchers contributed to the problem of the training of engineers in the information communication technologies industry in Ukraine and abroad. The problem of the training of future professionals in the field of computing is investigated in the dissertations of A. Gudzhiy (the teaching of programming at higher education), H. Kozlakova (the continuous training of specialists in computer systems), T. Morozova (the theoretical-methodological fundamentals of higher information technology education), Z. Seidametova (the methodical system of continuous training of specialists in information technologies), S. Semerikov (the basics of fundamentalization of computing courses teaching), et al.

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 research of Ukrainian scientists in comparative professional pedagogics such as N. Bidiuk, T. Desiatov, V. Kovalenko, T. Koshmanova, K. Korsak, N. Patsevko, L. Pukhovska, A. Sbruieva, N. Sobchak, B. Shunevych.

The research works of V. Bykov, B. Vulfson, O. Karelina, I. Kozubovska, V. Kukharenko, N. Nychkalo, P. Stefanenko, N. Syrotenko, et al are dedicated to the aspects of lifelong education and distance education.

The scientific pedagogical research on the problem of development of Japanese pedagogical theory and practice with the aim of creative implementation of progressive ideas at the native educational practice were conducted by Yu. Boiarchuk, A. Dzhurynskyi, V. Elmanov, V. Kudin, I. Ladanov (the modern state of the education system), O. Myhailychenko, Ya. Neimatov, O. Ozerska (the professional training of English language teachers at higher educational establishments), N. Paziura (the theory and practice of intercompany training of specialists), V. Pronnikov, N. Repetiuk (the formation of education in modern Japan), T. Sverdlova (the theoretical fundamentals of the process of education humanization), L. Tsarova (the aesthetic culture of personality in modern school education).

The theoretical analysis of scientific works shows that the problem of the professional training of bachelors of computer science and also the necessity of development of modern teaching methods 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.

Results. The analysis of original monographic literature of Japanese and foreign scientists allowed to distinguish the peculiarities of organization of professional training of bachelors of computer science in the system of higher university education of Japan, namely: the flexible mechanism of forming of study content with the orientation on current requirements of labour market and personal necessities of students; the orientation on the fundamental integrated professional training; providing of feedback with students in educational process; the introduction of modern innovative pedagogical technologies in the different modes of study; the high level of scientifically-methodical and information providing; upgrading of quality of specialists training due to differentiation and individualization of study process.

It should be noted that the peculiarity of Japanese education is the "cult of teacher", that is why during the protracted period of time most classes at higher educational establishments were characterized by the monologue teaching. However in the conditions of globalization calls of time and integration processes the problem of upgrading of quality of specialists training at the establishments of higher education has become rather urgent that predetermines the urgent need in the diversification of educational process and activation of cognitive activity of students. Id est the improvement of methods and organizational forms of educational-cognitive work of students thus to provide their active and independent theoretical and practical activity on all stages of study, on what the modern state policy on the issues of education of Japanese government is directed [1, p. 78].

With the aim of training of competitive specialists on computer sciences at the universities of Japan the different individually-group forms of educational process organization are used: lecture, seminar, practical training and laboratory training, individual classes of students with their consultants-tutors (tutorials), field study, course project, Bachelor's theses and consultations. The most widely spread teaching and learning methods are the following: interactive teaching, cooperative teaching, collaborative work, e-learning, problem-based learning (PBL), activity-oriented teaching, blended learning.

K. Soetanto, famous Japanese researcher on questions of higher education, whose ideas in the countries of South-East Asia got the title "the effect of Soetanto", emphasizes the necessity of the creation of optimal conditions of educational activity of students organization that would assist the formation of expedient motivation of learning, acquainting them with the effective methods of cognitive activity and defining optimal facilities of gaining the aim [7].

In the new conditions of educational process the role of teacher is in the facilitation of study, consulting, supervision, adjustment, as the observance of principles of democratization and freedom of choice will assist to development of independence and responsibility of students for the realization of the aim and tasks of education. And beyond that, it is necessary for teacher to own the ability complexly plan the nurturing and instruction task, developing abilities of students on the basis of study their real possibilities, choose proper methods, facilities and forms of training organization, fulfil differentiated approach to students, operatively correct the chosen variant of educational process at the necessity [8].

The main source of motivation in the conditions of interactive learning is the own interest of student, and as a result the learning activity is characterized by high level of activity. The implementation of interactive teaching techniques in the process of specialists training stimulates student's need in realization of his potential, allows to increase the percent of information mastering considerably; study is oriented, unlike in traditional, not only on knowledge mastering but also on understanding, application, analysis, synthesis, evaluation [4].

The distinguishing feature of most group forms of organization of bachelors of computer science training in Japan is the method of discussion, at the use of which a basic accent is done on the development in students the skills creative and critical thinking.

For the successful realization of aims of bachelors of computer science training at the universities of Japan the system of traditional and innovative methods of stimulation and motivation of students to cognitive activity, providing of effective feed-back, is used, in particular: method of projects (prescribed in the curricula of specialists training), method of demonstration examples, method of expediently chosen tasks, method of "study through tasks", method of computer models, case method, method of strategies, method of experts, method of study in collaboration, method of microteaching, methods of distance work (methods of participation at distance conferences, distance "brain storming", methods of interactive web pages creation, network creative works, methods of work with searching systems, comparative analysis of information on WWW, methods of distance research works, collective educational projects, etc.), methods "brain storming", "press", "microphone", "continuous scale of ideas", "change of positions", etc. These methods are aimed at diversified training of creative capabilities of students, bring up in them the aspiration for the future, independence, desire to create and solve new problems in the industry of information-communication technologies. However it should be noted that such methods are counted on the intensive independent preparation of students, as participating at study that is conducted by these methods requires solid independent previous preparation.

Educational multimedia systems, multimedia Internet resources, multimedia presentation, electronic study register, etc. should be named as the most popular facilities of multimedia in the establishments of higher education of Japan [6].

On the basis of analysis of scientific works of Japanese scientists it is established that next to the traditionally-didactic and problem-searching methods interactive information-communication teaching technologies are actively implemented in the educational process, as the following: virtual class, interactive lecture, Grid-system, podcasting, teleconferences, electronic "meetings", tele-communication excursions and so on [5].

The amount of users of multimedia content, especially videolectures, increases with modern information processes. For this reason in research [3] the importance and necessity of expansion of association of users of project of OpenCourseWare (OCW), the publication in open access of materials of all courses of a higher educational establishment, that include the plans of courses, lectures content, homework tasks, examination questions, videotape recording of lectures and so on, that in Japan yet on a due levels are implemented at Keio University, Kyoto University, Osaka University, Tokyo Institute of Technology, University of Tokyo, Waseda University, is demonstrated. According to [2], potential possibilities of the implementation of mobile phones and plane-table personal computers as innovative facilities of study in the educational system of Japan are investigated.

It should be noted that the choice of forms, methods and teaching techniques at the universities of Japan is oriented on the problematic of teaching-learning process, analytical, reflective and creative activity, development of student's personality as a future highly qualified specialist and citizen.

The compulsory component of bachelors of computer science curriculum at the universities of Japan is practical training that envisages different forms: individual research work in computer laboratories; computational experiments; telecommunication projects; students' participation at complex theoretical and empiric research of the department; field study; participation at various professional societies for research projects, acquisition of necessary professional experience and increase of professional competence; internship on enterprises and organizations of Japan and abroad.

In this context it is appropriate to mark that Japanese establishments of higher education have the unique in the world institute of "student-researcher" (kenkyusei): a student who puts an aim to obtain a scientific degree has the opportunity to be engaged in research work in the select by him area of knowledge from six months to one academic year.

Conclusions. The use of different forms and types of study assists the formation of highly educated, mobile, competent, self-organized, competitive specialists in industry of information-communication technologies, ready to be included into the globalized world, open information society. We consider that leading world educational achievements should be implemented into the educational process of native establishments of higher education with the aim of training of bachelors of computer science as highly skilled professionals, ready to continuous life-long study, rapid adaptation in the rapidly changeable conditions of industry development and requirements of labour market. Having regard to urgency of this problem, the perspective directions for further scientific investigations we see in the process of improvement of specialists on computer sciences training in the native practice of higher education by the creative use of progressive ideas of the experience of Japan.

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Пододименко И.И. Дидактические особенности подготовки бакалавров компьютерных наук в учреждениях высшего образования Японии
Аннотация. Повышение качества подготовки специалистов в учреждениях высшего образования в настоящее время является основным приоритетом современной государственной политики правительства Украины по вопросам образования. Возникает вопрос объединения старых и новых форм и методов организации обучения. На основе анализа оригинальной монографической литературы японских и зарубежных ученых выделено особенности организации подготовки бакалавров компьютерных наук в системе высшего университетского образования Японии. Установлено, что в педагогическом процессе наряду с традиционными методами и формами обучения, такими как лекция и другие, достаточно интересными становятся новые, такие как метод полевого обучения, метод проектирования, метод дистанционного творчества, метод кооперированного обучения. Подчеркнуто, что выбор форм, методов, средств и образовательных технологий в университетах Японии ориентированный на проблемность в обучении, аналитико-рефлексивную и творческую деятельность, развитие личности студента як будущего высококвалифицированного специалиста и гражданина. Акцентировано внимание на роли преподавателя в современных условиях учебно-воспитательного процесса. Отмечено важность и необходимость использования прогрессивных идей зарубежного опыта относительно подготовки бакалавров компьютерных наук в отечественной практике высшей школы. Выделены перспективы дальнейших исследований относительно практики подготовки специалистов данной области знаний.
Ключевые слова: формы обучения, методы обучения, интерактивные методы обучения, бакалавр компьютерных наук.