



ANALYSIS OF PROFESSIONAL TRAINING OF FUTURE SPECIALISTS AVIATION PROFILE ABROAD

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Abstract

Topicality: a comparative analysis of various aspects of aviation institutions of higher education abroad provides key information on the training of higher education seekers on available courses in the field of aviation; exchange of experience with foreign institutions of higher education is one of the main factors in increasing the level of professional training domestic aviation specialists.

Goal: comparative analysis of various aspects of professional training in foreign institutions of higher education in the aviation field.

Methods: analysis of scientific achievements in the field comparative pedagogical studies, study and comparative analysis of information from sites of foreign institutions of higher education in the aviation field, generalization and specification of the received useful information for the purpose of formulating recommendations for the training of domestic aviation specialists.

Results: considered an example of comparison criteria when conducting a comparative study on the problems of professional training of air traffic control controllers; the peculiarities of the process of professional training of aviation specialists in higher education institutions of the USA, Europe and Asia are disclosed; a comparative analysis of various aspects of aviation institutions of higher education provides key information regarding the training of applicants for higher education on available courses in the field of aviation; shown the role of exchange of experience with foreign institutions of higher education as one of the main factors in raising the level of professional training of future aviation specialists.

Conclusions: in the main differences in the training of future aviation specialists abroad and in Ukraine are singled out and recommendations are given, the observance of which will contribute to positive changes in the domestic training of higher education students in the aviation profile.

Keywords: *professional training of future aviation specialists, foreign institutions of higher education, comparative pedagogical studies, comparative analysis*

Introduction. Exchange of experience and cooperation with international aviation institutions of higher education (here in after - HEIs) is one of the main ways to improve the professional training of aviation specialists in Ukraine. In the context of the globalization of education, the issues of internationalization, network interaction of higher education institutions, practice for those seeking higher education (here in after - HE), academic mobility, development and implementation of joint educational programs, promising forms of distance education, etc. are considered.

Research sources. The development of the theory and methodology of comparative pedagogical research was facilitated by foreign and domestic comparativist scientists such as N. Abashkina, E. Brazhnyk, J. Biridei, M. Bray, B. Wulfson, T. Desyatov, K. Korsak, N. Lavrychenko, O. Lokshina, Z. Malkova, N. Nychkalo, A. Sbruyeva, B. Holmes and others. K. Korsak (2009) believes that the operational sphere of comparative pedagogy is educational facts (phenomena, phenomena, etc.), educational systems, meta-analysis, which includes the study of non-educational objects and subjects of modern societies. That is, there are many levels of research within comparative pedagogy. The researcher proposed a hierarchy of such levels, created on the basis of taking into account the characteristics of the object of study and the complexity and importance of the goal set by scientists: static or dynamic description, quantitative or qualitative analysis.

Currently, scientists dealing with the problems of professional training of aviation specialists using the tools of comparative pedagogy have made it possible to identify the advantages and peculiarities of the training of aviation specialists in different countries, to identify the possibilities of appropriate application of innovative practice on the domestic plane (L. Gerasimenko, M. Lomakina, Ya. Mandryk, T. Plachinda, K. Surkova).

K. Surkova and M. Lomakina (2016) proposed, based on the analysis of the works of researchers in comparative pedagogy, an algorithm for conducting a comparative study in the field of professional training of aviation specialists, which is based on the achievements of comparative pedagogy, the peculiarities of the activity and training of aviation specialists, the main point is the definition comparison criteria.

When conducting comparative studies in the field of professional training of aviation specialists, one should take into account the fact that these are operator-type professions, complex professions, therefore professional training is a complex process

aimed at achieving the necessary result: the formation and reliability of professional skills and abilities in various conditions activity The criteria should be established based on the analysis of: theoretical and methodological literature and dissertation studies on comparative pedagogy; national and international aviation documents; official websites of aviation educational institutions; aviation organizations; the results of monitoring the professional activity and training of aviation specialists; results of a survey of experts in the field of training and professional activity. Example, when conducting a comparative study on the problems of professional training of air traffic control (ATC) controllers, the following comparison criteria were established: flight safety during air traffic service; intensity of air traffic; technological procedures; the level of reorganization of the air navigation system in accordance with international standards; ATC dispatcher; professionally important qualities; professional reliability; legislative framework of higher education; Higher Education; structure of higher education; the state and development trends of professional training of future air traffic controllers; structure, organization and content of professional training of future air traffic controllers; professionally oriented disciplines; interdisciplinary integration; correction and control of learning (Surkova, & Lomakina, 2016).

The components of the world's pedagogical technologies are being improved and developed, and there is a need for constant systematic monitoring of such achievements, especially for the field of aviation professional training. In addition, unfortunately, in the conditions of war, the practical training of aviation specialists is complicated, namely: flight training, practical training at workplaces of ATC controllers, aviation search and rescue specialists, flight practice of future unmanned aircraft specialists and other future specialists aviation profile. Therefore, the issue of modeling in the professional training of real future activities, which includes laboratories, simulators, and other types of electronic learning tools, is relevant. That is, when conducting a comparative analysis, the following criteria should be used: directions of training, research activity, financial aspects of training.

The purpose of the article consists in the study and comparative analysis of various aspects of professional training in foreign institutions of higher education in the aviation field and the provision of recommendations, the observance of which will contribute to positive changes in the domestic training of aviation specialists.

Research methods. The work uses methods of the theoretical level of research. Conducted analysis of scientific achievements in the region comparative pedagogical studies, study and comparative analysis of information from sites foreign HEIs in the aviation field made it possible to reveal information about the positive aspects of the professional training of aviation specialists, to highlight the main differences in the training of future specialists in the aviation profile by foreign HEIs from Ukrainian ones; the result of the generalization and specification of the received useful information is the formulation of recommendations for the training of domestic aviation specialists, compliance with which will contribute to positive changes.

Results and discussion. Aviation universities offer different types of training and cover a wide range of training programs. Bachelor's degree holders can study programs in airport management, aircraft construction, maintenance and air traffic management, etc. So, for example, higher education institutions in the USA provide a wide selection of study programs in a wide variety of areas. A great advantage of education in North America is that graduates have a chance to get a job in organizations that cooperate with the educational institution (dual education) after graduating from higher education institutions.

Education diplomas from European countries are highly valued all over the world. A wide variety of professional areas and educational institutions are concentrated in European higher education institutions, where you can study both on a paid basis and for free, in public or private HEIs. The quality of education in Asian countries is on a par with the best European and North American HEIs. This region is characterized by an innovative approach to education, based on the British education system, and prices will be lower than, for example, in some universities in Great Britain and the United States.

Below is a list of some aviation HEIs for the training of aviation specialists abroad. This comparative analysis of various aspects of US, European and Asian aviation higher education institutions provides key insights into available aviation courses. The University of North Dakota (USA) includes the School of Aerospace Sciences, which has an active research program offered to undergraduates in collaboration with private industry, government, unmanned aerial systems (UAS) researchers, and alumni. The field of research is unmanned aerial vehicle (UAV) systems, which includes: unmanned traffic control, joint aerospace methods and visualization; implementation of UAS BVLOS operations through network infrastructure; UAV command and

control systems (C2) for use beyond line of sight; inspection of power line components using a UAV.

The aviation school annually awards scholarships in the amount of about 370,000 US dollars to the graduates of HE in the aerospace industry. Applications are open to HE recipients enrolled in aviation courses during the spring semester, awarded on the basis of academic merit, leadership, flying achievement, and any criteria established by the scholarship sponsors. About 49% of full-time students in the university's master's programs receive financial aid (based on need), and the average scholarship or grant is \$5,366. The aviation school has a powerful material and technical base, for example, an airfield tower simulator (TRSS) is used in the training of ATC controllers. One auditorium contains a virtual workplace with an immersive visual system that simulates the view from a control tower. Simulated radar terminals are located in the second auditorium. Bachelor's degree holders have the opportunity to specialize in the following areas: flight safety, UAVs, management and human factors in aviation (USA Colleges.,2023).

In the School of Aviation and Transport Technologies of Purdue University (USA), scientific research is carried out in several specialized laboratories. Research focuses on biofuel testing and development, evaluation of soybean-diesel blends, turbine performance, human factors and crew resource management, etc.

A new direction is the search for innovative ideas to solve the problems of data and process visualization in aerospace manufacturing and life cycle management of modern smart aircraft. The Holleman-Niswonger Simulation Center provides hands-on training for students using a variety of devices and simulators. The Flight Operations Center gives VO candidates the opportunity to research and optimize more than 100 flights per day, thereby preparing them to work at airlines and their network operations centers, or at the FAA control center.

The University Aviation School maintains strong partnerships with the aviation and aerospace industry. This includes solving urgent issues in real time, planning curricula and educational programs, etc., as well as establishing partnerships for HE students through internships and other projects. The university offers scholarships for studying at the institute, which are awarded on the basis of merit and financial need. Master's studies (Aviation and Aerospace Management) focus on the study of such disciplines as operational analysis, safety systems development, project management, system integration and environmental sustainability, etc. (Kiiky, 2023).

The Jacksonville University (USA) program offers three master's degrees in: Human Factors in Aviation, Human Factors in Aeronautics, and Human-Centered Design. In addition, there are four master's courses (online mode) in the field of administration, development and management of airports, applied aviation security, aviation management and aviation security. AeroAstro's research areas have many variations, from autonomous systems to alternative jet fuels. Projects carried out in 25 AeroAstro laboratories are in the following areas: ATC, infrastructure and economics of air transport, aviation safety and weather, management and operation of airlines, human factors, flight equipment, impact of aviation on the environment (National School of Civil Aviation, 2023).

The Faculty of Transport of the Czech Technical University offers training in various specialties, including air and rail transport, transport systems, transport automation, security of information and telecommunication systems, transport and telecommunications management, and other specialties. Graduates work in transport and logistics companies (airlines, airports, railway companies). The higher education institution consists of 8 faculties and is the state higher education institution of the Czech Republic, so studying in it in the Czech language according to Czech law is free for everyone (Welcome to ČVUT., 2022). Terms of study at ZVO: bachelor's degree - 3-4 years; master's degree - 2-3 years (some specialties 4-5 years); doctoral studies - 3-4 years.

The learning process is based on the credit system. Every subject has a credit equivalent. In total, the 2-year master's program involves obtaining 120 credits. In a year, as a rule, you need to receive 60 credits, in a semester - 30. Each faculty sets the minimum number of credits that must be received in order to transfer to the next stage of study. Subjects studied at the HEIs are divided into compulsory (which Vocational education students must study in order to be admitted to the state exam) and compulsory optional subjects (which winner of HE chooses from the list of subjects offered by the department or faculty). Also Vocational education students can study subjects of their own choice (subjects studied at any faculty of their university). To graduate and receive a diploma, you need to earn 120 credits, pass all required subjects, pass state final exams and defend a thesis (Welcome to ČVUT., 2022).

At the Ecole Nationale de l'Aviation Civile (ENAC - National School of Civil Aviation) each program has its own recruitment process, primarily through competitive exams. ENAC has four bachelor's programs to train airline pilots and civil aviation

technicians. The school provides Airline Student Pilot Training (EPL) for eight months at its Toulouse campus; sixteen months of practical training are held at the Montpellier, Carcassonne, Saint-Jean and Mouret campuses. Since 1992, graduates of this training have been represented by the alumni association AGE PAC (National School of Civil Aviation, 2011).

The university has developed a master's program in international air transport operations management (IATOM), a master's program (supported by the European Commission) in satellite navigation, and a master's program in air navigation (in partnership with the Massachusetts Institute of Technology). The Master's Program in Human-Computer Interaction (IHM) is conducted in collaboration with the Paul Sabatier University.

ENAC provides special programs of *Mastère spécialisé* in Airport Management, Air Traffic Management (in partnership with Toulouse Business School), Communications, Navigation and Surveillance and Satellite Applications for Aviation (CNSSAA), Aviation Safety Airworthiness (ASAA, in partnership with the Institute Supérieure de l'Aéronautique et de l'Espace and École de l'Air) Air-Ground Systems Engineering Cooperation (AGCSE), Aviation and Air Traffic Management (AATM) and Aerospace Project Management etc. (National School of Civil Aviation, 2023).

The complex of ENAC ATC simulators has an area of 2,200 square meters, which provides opportunities for the placement of training equipment and resources (CBT, Tower, Approach, En Route). For CBT (computer-based training), five rooms with 10 dual screens are used, offering several teaching methods. SCANSIM simulation system is used for control tower and landing. (ENAC. ATC simulators, 2023)

The Riga Aeronautical Institute (RAI) trains specialists in bachelor's and master's programs. Training is conducted in 2 stages. Bachelor's programs - 4 years of professional direction: management of air transport systems (pilot), maintenance of aircraft, organization of international transport, management of international enterprises, air traffic control - air traffic controller, international logistics, maintenance of electronic equipment, and 2 years of master's programs by areas: management of transport systems and management of international transport enterprises.

RAI is a partner of Pelican Flight Training LLC, located at North Perry Airport, Florida, USA. F. Provides an opportunity to obtain a CPL/ATPL commercial pilot's license, then to undergo a retraining course for piloting a jet aircraft and obtain a typical qualification at a training center. RAI has the certificate of the European Aviation Safety Agency

(EASA) PART 66, PART 147 under the number LV.147.0001 and programs for the types of Boeing 737 - 300/400/500 (CFM 56) B1; Boeing 737 - 300/400/500 (CFM 56) B2. Specialist training is also carried out at the RAI training center, within the framework of the "Manual of Maintenance Organization Procedures" (MTOE). Dispatching simulators provide practical training of students and UPR specialists under the guidance of instructors who have licenses that meet EASA requirements, with a qualifying mark of STDI. (Riga Aeronautical Institute, 2023).

The demand for international education in Asian countries is developing rapidly. The process is due to a completely different style of education, which is called the "education hub", a high standard of living, large investments in the educational market and the rapid economic growth of the countries of the Asian region.

Programs in standard fields of study last 4 years (130-140 credits), while training in professional programs (including aviation) takes 5-6 years. For the first two years, HE students study basic and optional general subjects, then focus on special subjects, which are also divided into compulsory and optional.

Let's consider the process of training future aviation specialists using an example Singapore Aviation Academy (SAA). The study program consists of basic (mandatory) modules, additional modules, a mandatory group project and a separate research project. SAA offers Diplomas in Civil Aviation Management and Aviation Safety Management (Singapore Aviation Academy of Singapore, 2023). The preparation requires the completion of basic (mandatory) modules, required additional modules and a group of projects, an individual research project, which should be completed through online observations and meetings with graduates of aviation universities in each country.

SAA is ISO 9001 certified for quality assurance in the development and delivery of its training programs that meet ICAO standards and recommended practices. The Academy also offers degree programs through alliances with prestigious academic institutions from around the world. SAA offers education according to international standards: bachelor's degree (3-4 years), master's degree (1-2 years), doctor of science (2-5 years). For admission to each level of education, a HE applicant must prepare documents and present himself from the best side. The Admissions Committee pays attention to academic performance, exam results and motivation of HE applicants (Civil Aviation Authority of Singapore, 2023). Also, in some HEIs, HE graduates have the oppor-

tunity to combine a bachelor's and master's degree, get a double degree, and study under an exchange program at another university.

Conclusions. The quality of professional training is significantly increased under the condition of transforming vocational training students from objects into subjects, which ensures their active activity in vocational training and influence on the organization, content, methods, and techniques of professional training. Thus, today each HEI strives to conclude bilateral agreements on cooperation with universities of different countries of the world, develops academic mobility at the level of agreements between universities, individual faculties, educational programs and specialties.

The process of Ukraine's integration into the world educational space necessitates the involvement of theories and methods of professional education of advanced countries in the reform of the domestic higher aviation school and active improvement of the educational system in accordance with world standards. Aviation higher education institutions seek to cooperate with partners in the aviation industry, international organizations and other aviation HEIs.

At the same time, the main differences in the training of future specialists in the aviation profile by foreign HEIs from Ukrainian ones are: the developed culture of choosing elective disciplines by HE graduates that they want to attend as part of the educational course; there are no state-wide professional standards, instead, there is a set of mandatory lectures and seminars, and the second part is chosen by each HE applicant at his own discretion; training at aviation universities will cost an average of 10-25 thousand dollars per year. These figures are completely different from Ukrainian ones, where the cost of studying at prestigious

aviation universities rarely costs more than two thousand dollars a year; the actual absence abroad of specialized aviation HEIs training future aviation specialists. The existence of aviation institutes, schools, centers, etc. in universities is widespread.

Recommendations have been formulated, the observance of which will contribute to positive changes in the domestic training of aviation specialists: apply the principles of autonomy and independence of HEIs in the organization of the educational process; to establish partnership relations in the scientific areas of the aviation direction with foreign HEIs; create groups of developers of educational programs and projects, which will include stakeholders in the aviation industry; actively use the websites of aviation organizations in preparation

for the purpose of using professional information; develop and implement electronic training tools for practical training of future aviation specialists using modern digital technologies; to introduce and improve the teaching of professionally oriented disciplines in English; take into account the needs of the modern labor market through the cooperation of state, private and public organizations, HEIs and aviation enterprises, primarily Ukraeroruh; rationally combine normative and selective parts of the curriculum, theoretical and practical training aimed at forming professional abilities and building educational strategies; to organize the educational process and develop educational and program materials aimed at the development of the individual educational trajectory of the HE applicant as a personal way of realizing personal and professional potential;

implement programs of academic mobility, which provides the opportunity for participants of the educational process to study, teach or conduct scientific activities, etc., in HEIs of Ukraine or abroad; to focus on the formation of the ability to apply knowledge, skills and abilities in practice,

Solving these issues will allow domestic HEIs not only not to lose their positions in the training of future specialists in the aviation profile, but also to multiply existing achievements. We consider further research to specify the provided preliminary recommendations, highlight the most important of them, discuss and evaluate such recommendations with experts in the field of aviation activities for the purpose of further experimental verification and implementation in the educational process.

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АНАЛІЗ ПРОФЕСІЙНОЇ ПІДГОТОВКИ МАЙБУТНІХ ФАХІВЦІВ АВІАЦІЙНОГО ПРОФІЛЮ ЗА КОРДОНОМ

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Реферат

Актуальність: порівняльний аналіз різних аспектів авіаційних закладів вищої освіти за кордоном надає ключову інформацію щодо підготовки здобувачів вищої освіти за доступними курсами в галузі авіації; обмін досвідом із зарубіжними закладами вищої освіти є одним із основних факторів підвищення рівня професійної підготовки вітчизняних авіаційних фахівців.

Мета: порівняльний аналіз різних аспектів професійної підготовки в закордонних закладах вищої освіти авіаційного спрямування.

Методи: аналіз наукових досягнень у галузі компаративних педагогічних досліджень, вивчення та порівняльний аналіз інформації з сайтів закордонних закладів вищої освіти авіаційного спрямування, узагальнення та конкретизація отриманої корисної інформації з метою формулювання рекомендацій для підготовки вітчизняних авіаційних фахівців.

Результати: розглянуто приклад критеріїв порівняння при проведенні компаративного дослідження з проблем професійної підготовки диспетчерів управління повітряним рухом; розкрито особливості процесу професійної підготовки авіаційних фахівців у закладах вищої освіти США, Європи та Азії; порівняльний аналіз різних аспектів авіаційних закладів вищої освіти надає ключову інформацію щодо підготовки здобувачів вищої освіти за доступними курсами в галузі авіації; показано роль обміну досвідом із зарубіжними закладами вищої освіти як одного із основних факторів підвищення рівня професійної підготовки майбутніх авіаційних фахівців.

Висновки: виокремлено основні відмінності у підготовці майбутніх авіаційних фахівців за кордоном та в Україні й надано рекомендації, дотримання яких сприятиме позитивним зрушенням у вітчизняній підготовці здобувачів вищої освіти авіаційного профілю.

Ключові слова: професійна підготовка майбутніх фахівців авіаційного профілю, зарубіжні заклади вищої освіти, компаративні педагогічні дослідження, порівняльний аналіз

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