відбувається глобальні зміни (пандемія, війна) освіта стикається з ризиком того, що не зможе продовжити свої звичні процеси і повинна перейти до миттєвих управлінських змін. *Мета статті* полягає в тому, щоб визначити та окреслити позитивні елементи голографічних технологій, які допоможуть підвищити інтерактивність у процесі викладання та навчання. *Завдання дослідження* полягає у знаходженні альтернативного рішення щодо залучення новітніх технологій навчання у підготовку майбутніх інженерів. Як свідчить досвід, у такому випадку, освітньо-інформаційне середовище є найкращим рішенням для проведення занять. Але проблема навчання полягає в інтерактивності студента щодо покращення мотивації майбутніх фахівців за допомогою новітніх технологій. У технічному університеті пропонуємо запровадити інноваційні методи викладання та навчання, включаючи ігри, моделювання та голограми. Тим часом, підготовка є не лише передавання знань, але й активний, конструктивний та когнітивний процес, за допомогою якого майбутній інженер управляє внутрішніми ресурсами для формування ключових професійних компетентностей. *Методи дослідження* полягають у вивченні й узагальненні вітчизняного та зарубіжного досвіду для обґрунтування концептуальних положень голографічних технологій навчання, структурно-наукового аналізу, а також спостереження за навчальним процесом. *Результати.* Для покращення підготовки майбутніх інженерів в умовах освітньо-інформаційного середовища голографічні технології можуть бути корисні та стати ще одним ресурсом, який може змінити спосіб створення та проведення занять. Щоб отримати цей результат, необхідно вивчити доцільність голографічних технологій відповідно до підготовки в умовах освітньо-інформаційного середовища. У статті розкрито сутність розглянутих голографічних технологій, описано переваги та особливості їх впровадження у навчальній процес технічного університету. Це допомагає студентам активізувати пізнавальну діяльність та стимулювати їх до самоосвіти. У ході опрацювання низки дослідницьких ідей запропоновані різні наукові підходи до трактування терміну «голографічні технології». *Висновок.* Відповідно до наявних концепцій, голографічні технології розглядають як результат творчого процесу і як процес впровадження нововведень. Визначені особливості, перспективи впровадження голографічних технологій у навчальний процес технічного університету потребують подальшого детального аналізу та вивчення в комплексній взаємодії з інформаційними системами.

Ключові слова: голографічні технології навчання; інформаційні системи; навчальний процес; освітньо-інформаційне середовище; підготовка майбутніх інженерів

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TRAINING OF INSTRUCTORS OF THE AVIATION EDUCATIONAL INSTITUTIONS AT THE NATIONAL AVIATION UNIVERSITY

Abstract

The article deals with the peculiarities of training of instructors of the aviation educational institutions at the National Aviation University. The purpose of training instructors is the formation of professional competencies within the existing qualifications, necessary for professional activity as a teacher. This activity has its own specifics and requires thorough psychological and pedagogical training.

Study Conduct. The Department of Pedagogy and Psychology of Occupational Education carried out the study to improve the training of instructors as well as to take into account the experience of organizing relevant training. The survey of teachers (5 teachers with more than 20 years of work experience) and students (76 people) was conducted, regarding the structure, content of the program, the sequence of studying topics, methods and technologies of education.

Results. At the National Aviation University, the training of instructors of aviation educational institutions is carried out according to the improved program "Instructor (teacher) of an aviation educational institution". The proposed program includes five main content blocks, which allows the

instructors to develop competencies aimed at organizing and conducting professional training of aviation personnel in accordance with the established requirements.

Conclusions. Training and retraining programs for aviation specialists need constant updating, taking into account the modern industry achievements. This, in turn, confirms the need for continuous improvement of the training of instructors (teachers) of aviation educational institutions. In order to improve the quality of professional training and implement the regulatory instructions and recommendations set forth in the documents regulating activities in the field of aviation, the professional training of instructors must be organized in accordance with the requirements of the Air Code of Ukraine and ICAO and be based on modern psychological and pedagogical research.

Key words: competence; instructors; professional training; psychological and pedagogical training; readiness

Introduction. The aviation industry is a strategically important sector of the modern Ukrainian economy. In the conditions of the world economy globalization, it is one of the important elements of Ukraine's integration into the modern system of international economic relations, and it is of particular importance for solving social and economic problems and improving the quality of life in the country.

The successful functioning of the aviation industry is determined by the professional activity of specialists, which, in turn, is determined by the level of their professional training and retraining. It should be noted that aviation specialties belong to the group of high-risk professions. Activities under extreme conditions set high requirements for specialists, since the main thing – the safe stay of a person in the air space – depends on them.

Such specialists must have developed both professionally important and personal qualities at a sufficient level, which will allow them to constantly monitor their condition, be ready for adequate assessment of the situation and quick decision-making.

Professional training of specialists in the aviation industry is a complex organizational system characterized by a large number of different stages of training and retraining, united by the common goal of the aviation industry functioning. This is a set of special effective means of training, the integrative influence of which is aimed at forming the reliability of aviation specialists in both normal and extreme modes of activity (Hander, 2007).

The importance of this issue is reflected in the Air Code of Ukraine and in the documents of the International Civil Aviation Organization (ICAO), according to which the professional training of aviation specialists appears as one of the systems affecting the general factors.

Research methods and techniques. In Ukraine, higher aviation educational institutions provide training of qualified specialists for the aviation industry. In addition, in accordance with the Air Code of Ukraine, retraining and advanced training of aviation personnel and ground crew is periodically carried out obligatorily, with the receipt of the appropriate certificate. Appropriate training should be conducted in the aviation educational institutions, retraining and advanced training centers for aviation specialists, and other certified institutions (Air Code of Ukraine, Article 52).

Since 1992, Ukraine has closely cooperated with ICAO both in the technical direction (joint development of aviation, cooperation in the field of aircraft production) and in personnel administration (training of specialists, development of educational programs etc.). According to ICAO standards, staff training is based on a competency-based approach.

ICAO has developed competency frameworks, which are a group of clearly described competencies and competency standards.

The ICAO competency standard is understood as the level of efficiency established as acceptable when assessing whether a qualification level has been reached (or not).

The competence system of personnel training and evaluation is characterized by:
- result-oriented performance;
- attention to the performance standards of operation and measurement of these standards;
- development of training courses based on established performance standards (Doc 9868, 2020).

According to ICAO documents, an algorithm for the aviation personnel training has also been developed based on a competent approach, which includes several stages.

The preliminary analysis stage is aimed at identifying the need for training (retraining) and forming an educational strategy. If training is needed, an assessment of the requirements for human and financial resources necessary for the development of the training course is carried out. Much attention is paid to the evaluation of the economic efficiency of the educational decision. The completion of the stage is the plan

for the course development and the plan for evaluating the effect of the training on the airline professional activity.

Then, at the next stage, the position and its components are analyzed, namely the functions, tasks, subtasks, and elements of tasks. Each task is analyzed in terms of frequency of use, importance, complexity and priority. The description of the professional task includes descriptors, areas of application, range of definitions, a description of all subtasks and elements of the task in the context of their criteria, requirements for knowledge, intellectual and physical skills, relationships within each subtask, the range of application of the task and a list of evidence of effective performance of the task. The analysis and description of the position make it possible to form a standard of professional activity, i.e. a criterion or a set of criteria that allow determining the difference between permissible (competent) and unacceptable (incompetent) professional activity.

The next stage is the analysis of the trainee pool, aimed at ensuring that all trainees have the basic skills necessary to start studying the course. The purpose of the stage is to collect data about the trainee by studying documents about education, obtaining information from the personnel service etc. In the process of conducting the analysis, it is important to study the methods and technologies of training that are suitable for most trainees. Based on the results of the previous stages, the training program is being developed. Then, activities are organized to plan practice-oriented training, which includes theoretical and practical training.

The process of developing modules is related to the development of the structure of each module. It includes the definition of the module learning module purpose, the main part (a list of types of educational activities, each of which is aimed at achieving a specific goal) and the conclusion (the effectiveness of achieving the goal after completing the module (test after completing the module)) and evaluation of achievements (feedback).

After the formation of the modules structure, the selection of educational methods, technologies and means is made. At this stage, in accordance with the requirements established by the ICAO model, a manual for the teacher who will be involved in the training process is developed.

In order to determine the effectiveness of the course, after the completion of training, information from trainees, instructors and examiners is collected. Analysis and evaluation of training and assessment plans should be based on actual data. Such an analysis either confirms the effectiveness of the training course, or recommends that it be improved or, in general, canceled as ineffective (Kearns, 1994).

The purpose of the competence system of training and assessment is the training and assessment of a specialist's ability to work in accordance with the standard requirements established in the organization.

An important advantage of the competence-based approach to the training process is the ability to stimulate aviation specialists and create conditions for achieving a higher level of operational capabilities, while guaranteeing a basic level of qualification as a minimum standard.

The components developed by ICAO, which are necessary for the program development of the competence system of training and assessment, allow to prepare training courses for aviation personnel quite quickly and easily:

- *Specification of the training course* – purpose of training (retraining), tasks and requirements that should be met during training.

- *Adapted competence model* – competence requirements with appropriate description and performance criteria based on the competence framework, which is used to develop a competence system of training and assessment for a specific specialist.

- *Evaluation plan* – a description of the means and process of collecting reliable and objective data on the effectiveness of training at its various stages.

- *Training plan* – training program (includes: knowledge, skills, attitudes, lesson plans and schedules, forms and control methods etc.).

- *Training and assessment materials* – human, material and organizational resources needed to implement the training and assessment plan (Doc 9868, 2020).

The complexity of training aviation personnel, the introduction of new technologies and work methods require solving problems related to the improvement of approaches to training. Among them, it is worth noting:

• ensuring the compliance of the training content with the duties that the specialist will perform;

• achieving an effective ratio between training opportunities and control (evaluation);

• ensuring the integration of knowledge, skills and attitudes (KSA) necessary for effective performance;

• ensuring the involvement of all available training tools and methods;

• support of continuous training and improvement of work efficiency throughout the entire professional activity of an aviation specialist;

• training a sufficient number of well-trained and qualified *teachers-instructors* (Doc 10098, 2021).

Results. For many years, training and retraining of qualified instructors (teachers) has been carried out based on the National Aviation University (NAU).

It should be noted that in order to ensure the effective professional training, there was a need to reorient the traditional system of retraining. To form the qualitatively new knowledge, skills and attitudes of the future instructors (teachers), the interaction and partnership of all participants (teachers, trainees, administration, and customers), active exchange of experience, training and mutual learning are of particular importance.

One of the factors of revising and updating the principles and methods of retraining is the instructor's mastery of modern innovative technologies and the ability to use them in their instructor activities. Peculiarities of professional activity require, first of all, deep professional skills, and secondly, readiness for changes in the shortest possible time and with minimal expenditure of effort. Such a requirement implies the ability to actively develop new types of activities and the related ability to self-improvement and continuous learning.

From this point of view, the purpose of training is the formation of an effective personality, who has the opportunity to independently find new ways and types of activity and to enter new professional areas.

A necessary requirement of modern life is the freedom of choice, which implies the interdependence of education and self-education and is subject to the goals of personal growth and improvement, becoming a psychological factor in the activity of a specialist, his desire for new things, readiness for changes, and the way of his professional life. An integral part of such a position is critical thinking, the ability to reinterpret the established views, methods of activity, behavior patterns, to be able to correlate tradition and innovation, to see their positive or negative sides.

Our approach is based not so much on the idea of knowledge (information) transfer, but on the idea of involving the trainees in active cooperation, scientific research and self-determination (cognitive, life and personal ones).

This idea is realized with modern educational technologies that perform humanistic, developmental, methodical, design and other functions. Typical features of modern educational technologies are conceptuality, consistency, didactic expediency, innovativeness, optimality and guaranteed results. These technologies draw on the principles of integrity, variability, interactivity, fundamentalization, professional orientation, information support etc. They are based on systemic, axiological, humanistic, personal-activity methodological approaches stemming from the concept of modular, problem-based, contextual learning (Sysoieva, 2011; Ohiienko, 2015).

According to the contextual learning concept, the training of instructors (teachers) is carried out in the context of the future instructor activity taking into account its specifics. It is a form of personal activity and a condition for the formation of professionally important personality qualities of the future instructor (Verbytskyi A., 1991).

In our opinion, the contextual learning has the following advantages: the learning process is focused on the immediate application of results; forms the ability to apply knowledge and skills in practical activities; allows gaining personal experience in the process of learning. In addition, the correlation of the learning process with the assessment results allows the student to independently assess his own progress.

The basis of such educational cooperation of teachers and trainees is not just another part of information, but specific situations in their subject and social certainty. As a result, the activity of trainees takes the form of future teaching activity.

Presenting and solving situational tasks and exercises develops the pedagogical abilities of trainees, forms a valuable attitude to education and future teaching activities.

This approach is successfully implemented using the case technology. Case tasks, games and documentary videos with demonstration of problem situations are showed and solved both during training sessions and during supervision.

The implementation of the idea of cooperation between the teacher and the student is realized through a person-oriented educational technology.

Its didactic aspect involves:
- subject-subject relations;
- providing the content of training with personal meaning and personal significance;

- creation of different learning conditions for everyone (depending on the opportunities and needs);
- providing the trainees with the right to choose methods of educational material assimilation, formation of an individual style of educational activity;
- use of interactive educational technologies;
- development of trainees' abilities for introspection and reflection;
- the teacher's role as a facilitator, organizer of trainees' educational activities;
- ensuring a situation of success and creating opportunities to demonstrate one's pedagogical abilities.

The basis of personally oriented educational technology is the interactive pedagogical interaction of all participants in the educational process: teachers with trainees and trainees among themselves.

Interactive training involves mandatory work of trainees in small groups based on cooperation and cooperation using game forms of training.

This interaction involves the following logic of educational activity: motivation ⇒ formation of new experience ⇒ experience comprehension through use ⇒ reflection.

Interactive training involves mandatory work of trainees in small groups based on cooperation using game forms of training. At the same time, the main role of the teacher is the ability to organize productive group and interpersonal communication of the trainees.

Interactive learning during the training of instructors (teachers) is based not only on the processes of perception, memory and attention, but primarily on creative productive thinking and communication and is implemented through:
- group subject-subject interaction (subject position, cooperation, constructive and friendly atmosphere);
- dialogue-polylogue (the ability to listen, ask questions and answer questions, express and defend one's opinion, argue);
- thinking and meaning-making (ability to perform mental operations, clearly express one's position, understand and explain phenomena, facts, laws and theories);
- freedom of choice of means and methods of educational material assimilation (creativity, independence, choice of original ways of solving educational tasks, manifestation of individual style of educational activity);
- a situation of success (the use of a complex of pedagogical tools that contribute to the success of all trainees without excluding trainees);
- reflection (self-analysis and objective evaluation and self-evaluation of the results of personal development and educational activities).

Thus, the theory of person-oriented education, stemming on the idea of interactive pedagogical interaction and the concept of contextual learning, form the basis of the training of instructors of aviation educational institutions at the NAU.

This approach, in our opinion, provides opportunities for increasing the educational process efficiency, training of highly professional instructor (teaching) personnel. Since, on the one hand, the use of modern educational technologies provides an opportunity to prepare a professionally competent teacher-instructor, on the other hand, it introduces him/her to theoretical aspects, a variety of educational technologies and ways of their application in future instructional activities.

Training of instructors (teachers) of the aviation educational institutions of the National Aviation University is carried out under the program "Instructor (teacher) of aviation educational institution". The purpose of training is the formation of professional competencies necessary for professional activity as an instructor (teacher).

The proposed training program allows the formation of competences in instructors (teachers) that are directly related to professional and pedagogical activity and are aimed at organizing and conducting:
- professional training of aviation personnel in accordance with the established requirements;
- theoretical training by types and forms of professional training of aviation personnel;
- training of aviation personnel on simulators, aircraft and automated air traffic service systems;
- checking the knowledge and skills of aviation personnel during confirmation and upgrading of qualifications;
- verification of the compliance of the performed duties and qualifications of the aviation personnel with the requirements of the qualification characteristics.

The training of an instructor (teacher) has its own specificity, which consists, first of all, in the training of a teacher of special subjects who conducts lessons for the specialists from the group of high-risk professions. The reliability of a specialist in extreme conditions depends on the functional adaptation

systems formed in the process of professional training, as well as the integration of motivational, emotional, intellectual, physical and psychophysical components of activity aimed at effective provision of professional functions in extreme conditions.

Another feature of the activity of the instructor (teacher) is that he/she must be ready to teach in the same group of trainees with different levels of training, status, work experience and different ages. This is explained by the fact that the trainees are trained once every two years, and groups are completed as the term expires after the initial training or previous advanced training. This requires thorough psychological preparation.

The training program includes five main content blocks:

- Peculiarities of the organization of adult education. Specifics and principles of working with an adult audience. Resistance to learning and methods of overcoming it, taking into account the age characteristics of the trainees. Psychological features of people, which are prerequisites for successful learning.

- Modern technologies of adult education. Determination and selection of relevant forms of education for different categories of trainees. Methodological culture of the instructor (teacher).

- Assessment of learning effectiveness. Control and evaluation of trainees' knowledge. Criteria for evaluating knowledge, skills, and abilities.

- Psychological features of interpersonal interaction in educational groups of adults. Methods of prevention of difficulties in pedagogical communication.

- Psychological features of the instructor's (teacher) professional activity. Areas of responsibility of the instructor (teacher) and trainees. Ways of self-control and emotional balance of the instructor (teacher).

The results of training under this program are:

- acquisition of systematic knowledge of andragogy and psychology of learning, methods of pedagogical activity, learning process organization, knowledge and skills control systems, methods of teaching the subject, new learning technologies;

- ability to select educational material for the formation of knowledge and skills in accordance with the purpose of education;

- the ability to choose and optimally use methods and means of education depending on the goals of education and the characteristics of the educational group;

- the ability to create a favorable atmosphere for learning, to apply methods of psychological and pedagogical communication with trainees, to optimize the educational process depending on the situation;

- ability to plan individual and independent work of trainees;

- mastery of methods and means of pedagogical control of the level of trainees` knowledge and skills.

Conclusions. The aviation industry is always at the forefront of the latest technical developments, which requires aviation professionals to be able to adapt to new methods, processes, knowledge and skills and to acquire the necessary competencies. Programs of training and retraining of aviation specialists need constant updating to include new content and methods of training, they depend on new developments in the field of training and dissemination of information, they should be constantly updated taking into account the latest technical achievements and achievements of educational practice. This confirms the need to strengthen the scientific and methodical component of the psychological and pedagogical training of teachers (instructors). In order to improve the quality of professional training of aviation personnel and to implement the regulatory instructions and recommendations, set forth in the documents regulating the aviation activities, professional training of aviation specialists should be organized in accordance with the requirements of the Air Code of Ukraine and ICAO based on modern psychological and pedagogical research.

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ПІДГОТОВКА ІНСТРУКТОРІВ АВІАЦІЙНИХ НАВЧАЛЬНИХ ЗАКЛАДІВ В НАЦІОНАЛЬНОМУ АВІАЦІЙНОМУ УНІВЕРСИТЕТІ

Резюме

У статті розглянуто особливості підготовки інструкторів авіаційних навчальних закладів в Національному авіаційному університеті. Метою навчання інструкторів є формування професійних компетенцій у меж ах наявної кваліфікації, необхідних для професійної діяльності як викладача. Ця діяльність має свою специфіку, тому потребує ґрунтовної психолого-педагогічної підготовки.

Процедура дослідження. Дослідження проведено з метою вдосконалення підготовки інструкторів та з урахуванням досвіду організації проведення відповідного навчання кафедрою педагогіки та психології професійної освіти шляхом опитування викладачів (5 викладачів з досвідом роботи понад 20 років) та анкетування слухачів (76 чоловік) щодо структури, змісту програми, послідовності вивчення тем, методів і технологій навчання.

Результати. В Національному авіаційному університеті навчання інструкторів авіаційних навчальних закладів здійснюється за вдосконаленою програмою «Інструктор (викладач) авіаційного навчального закладу». Запропонована програма включає п'ять основних змістових блоків, що дозволяє сформувати в інструкторів компетентності, спрямовані на організацію та проведення професійного навчання авіаційного персоналу відповідно до встановлених вимог.

Висновки. Програми підготовки та перепідготовки авіаційних спеціалістів потребують постійного оновлення з урахуванням сучасних досягнень галузі. Це в свою чергу підтверджує необхідність постійного вдосконалення підготовки інструкторів (викладачів) авіаційних навчальних закладів. З метою підвищення якості професійної підготовки та виконання нормативних вказівок та рекомендацій, викладених у документах, що регламентують діяльність у сфері авіації, професійна підготовка інструкторів має бути організована відповідно до вимог Повітряного кодексу України та ІCAO та ґрунтуватись на сучасних психолого-педагогічних дослідженнях.

Ключові слова: готовність; інструктори; компетентність; професійна підготовка; психолого-педагогічна підготовка