Improving the process of training air traffic controllers based on the formation of an electronic educational environment

Editorials

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Abstract

Information is provided on the results of research devoted to the improvement and development of the educational process of training aviation dispatchers. The issues of digitalization of educational and methodological support are being updated. The importance of convergence of the volume and composition of knowledge of university graduates in the specialty aviation dispatcher, based on the use of regulatory documents of civil aviation, is substantiated.

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The quote "Cadres decide everything!" will always be present as truth in all sectors of the economy. Human resources are the most valuable capital that solve current and upcoming problems and tasks. It is illiterate to say that they are more in demand in this sphere of the economy, and not in that one, because all spheres of the economy are closely intertwined and characterize the level of development of a particular state.

The aviation industry is an air artery of the world economy, through which passengers and material values are transported. It complements the land and sea arteries of material flows. The distinguishing side of aviation transport from others is that it does not have a sufficiently dense support in the process of movement, which could prevent it from uncontrolled downward movement in case of failure of the power plant or one of the systems that determine traffic safety. This circumstance proves the urgency of creating a reliable design and systems of the aircraft, as well as ground and flight operation systems. The safe functioning of on-board systems is naturally related to the level and quality of training of aviation specialists.

The effectiveness of the educational environment for training aviation specialists today is seen in the use of electronic means and teaching methods. This trend is associated with the digitalization of the educational and methodological support of the educational process. Regarding civil aviation, there is a special ICAO working document (https://www.icao.int/Meetings/a40/Documents/WP/wp_268_ru.pdf), which clearly reflects the relevance of this direction. This fact further proves the expediency of conducting research in this area.

The training of aviation specialists in general can be represented by the scheme shown in the figure. The main components of the educational system are lectures, practical and simulator classes, which are characterized as forms of conducting training sessions. These classes should be provided with the necessary educational and methodological material and technical means of demonstrating, imitating and practicing practical skills based on the theoretical knowledge obtained. This process is implemented through appropriate methods and methods on the part of the teacher, who must have pedagogical skills, skill and knowledge at a high level.

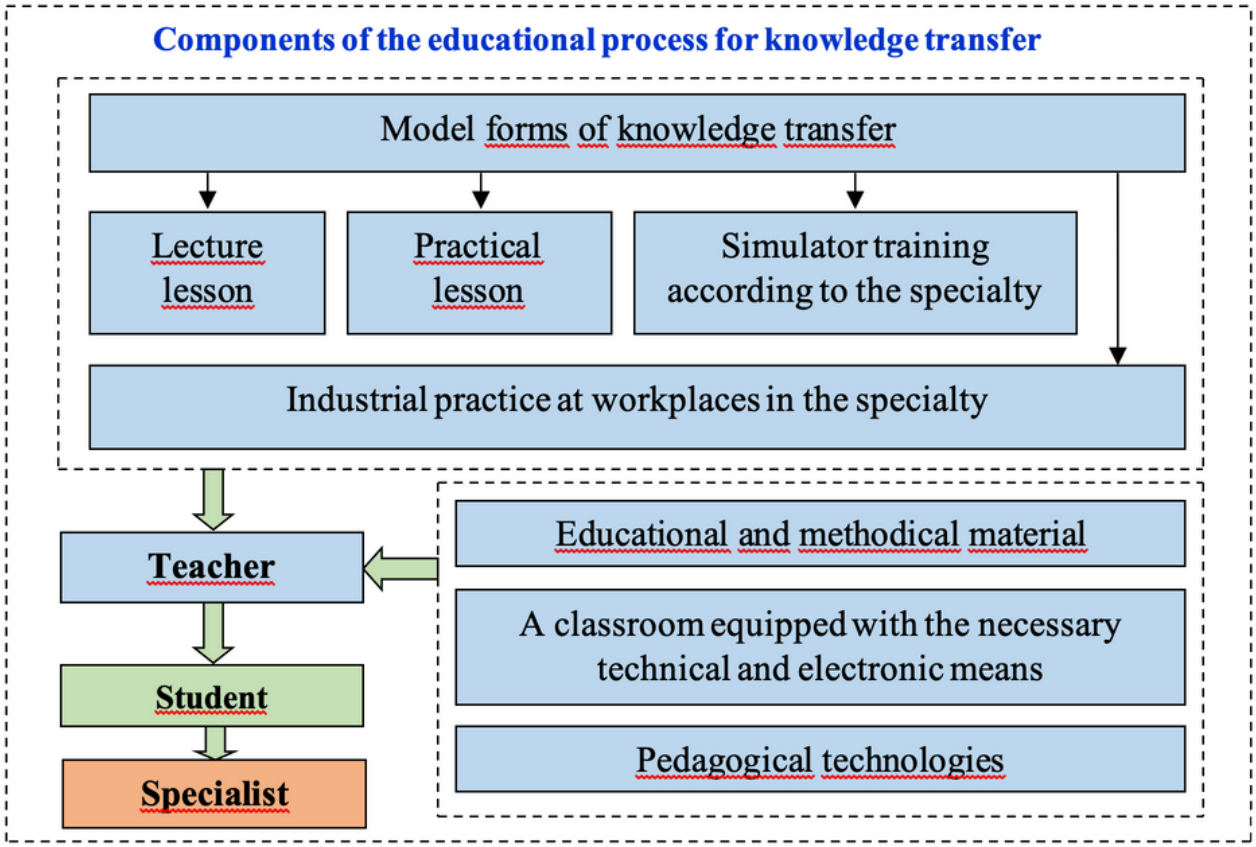

Figure 1. Structural and functional diagram of the educational process of training aviation specialists

It is obvious that in order to effectively conduct the educational process based on electronic means, it is necessary to create an information base that takes into account the necessary sufficient volume and thematic composition of theoretical and practical materials; electronic means of equipping the classroom; teaching materials and software developed on the basis of mathematical modeling and algorithmization of a particular segment of the educational process. The figure below shows a generalized structural and functional scheme of training air traffic controllers for civil aviation.

Currently, the Tashkent State Transport University is conducting research on the digitalization of the educational and methodological base of the process of training aviation dispatchers. Despite the fact that developments in this aspect are not funded, tangible results have been achieved. One of the main achievements is the complex of automated search and selection of regulatory documents of the Civil Aviation NPD (Shamsiev Z.Z. et al., 2020), which is designed for the process of training air traffic controllers.

The functionality of the complex covers the procedures for finding the necessary NAP, conducting practical classes based on it and monitoring knowledge. A methodological guide has been developed for conducting practical classes on the NAP.

The expediency of the development of the complex is justified by the fact that ensuring the safety of civil aviation flights during dispatching services is entirely based on the NAP. The overwhelming number of rules and regulations given in civil aviation documents are the results of the analysis and systematization of a large number of negative events from the practice of flight and ground operation of aircraft. Therefore, strict requirements are imposed on their compliance. The number of NAPS used in civil aviation is in the hundreds and even thousands. They are diverse. Each of them has a specific purpose, has domestic and international statuses. For example, there are more than a thousand ICAO documents (https://standart.aero/ru/icao). This situation to a certain extent complicates the activity of students in the search, study and application of documents. Therefore, the development of a special electronic system for searching and studying NAPS has a high degree of expediency. In addition, their expediency is also present when taking classes on simulators, for virtual testing and consolidation of knowledge in the "Pilot-air traffic controller" mode. The implementation of this approach is useful not only for students, but also for industry specialists who pass certification at a set time. In particular, there is a special document for certification of civil aviation personnel of the Republic of Uzbekistan (AR RUz-61,2004). According to this document, more than 90 questions and 13 areas of knowledge are provided for the certification of aviation dispatchers. In the aspect of the achieved results, currently, taking into account the integrity, separate fragments of the software product of the electronic educational and methodological support system have been developed. An important area of research is the development of a scientifically based curriculum, on which the range of necessary and sufficient knowledge that allows graduates to successfully find a job depends entirely. In this regard, a new approach has been developed for the formation of the structure and composition of curricula (Shamsiev, Z.Z., 2021). The novelty of the approach is expressed in the fact that the composition of the programs is formed on the basis of civil aviation documents defining the rules for certification of aviation personnel, including air traffic controllers.

This approach maximizes the adequacy of the volume and composition of graduates' knowledge to the requirements of the employer.

Another important aspect of the research work is the development of an electronic method for diagnosing the professional suitability of a specialist for the workplace (Shamsiyev Zair Ziyayevich et al., 2022). At present, the general contours of the system called "Aviation Tutor" are defined, the composition of its tasks is established and justified. Based on this research direction, a software and algorithmic complex for monitoring air traffic controllers has been developed. The software package has been introduced into the educational process of the aviation educational institution of the Republic of Uzbekistan, which trains pilots.

Conclusion

Based on the evaluation of research in the field of improvement and development of the educational process of training aviation dispatchers, we can say that they are entirely based on the requirements, norms and rules given in the regulatory documents of civil aviation. It seems that this approach is the only correct and appropriate to improve the quality of training of aviation specialists.

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