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Liliya Korol

PECULIARITIES OF CLASSIFYING AVIATION ENGINEERS ACCORDING TO THEIR SPECIALITIES IN GREAT BRITAIN

National aviation university, Aviation
1, Komarova avenue, Kyiv, 03680, Ukraine
E-mail: matroskina88@gmail.com

Abstract

Introduction*: The article deals with the issue of classifying aviation engineers in the system of higher education in Great Britain.* **Different ways of classification:** *There were considered both national classification and information sources available for future students.* **Types of aviation engineers:** *Joint Academic Coding System as well as jobs list available at Universities and Colleges Admissions Service were analyzed and three major groups of aviation engineers specializations were derived.* ***Conclusions****: We suggest that the results of the investigation should be used in further research of institutions that provide higher education for aviation engineers.*

Keywords: aviation engineer; classification; Great Britain; higher education; specializationб subject; training course.

1. Introduction

Aviation engineering is a vast field of study, which comprises numerous, sometimes intertwining, subjects. In order to advance in comparative analysis of aviation engineers' professional training in the United Kingdom and Ukraine, we need to define what aviation engineer is and what the main peculiarities of aviation engineer's classifications are there in the system of higher education of Great Britain. In order to do that it is necessary to consider different information sources, namely official list of professions, verified by the government, and information discourse available to future students, who are in the process of choosing a training course at a university.

2. Different ways of classification

Basically training courses in universities of Great Britain are classified according to the key subjects they are based on with the help of Joint Academic Coding System, which was developed by Higher Education Statistics Agency (HESA) and Universities and Colleges Admissions Service (UCAS) in 1999. There are 19 subject areas with numerous principal subjects associated with them. As aviation engineers can specialize on different aspects of aviation, they can choose the following principal subjects in the area H Engineering:

- General engineering
- Integrated engineering
- Safety engineering
- Computer-aided engineering
- Mechanics
- Fluid mechanics
- Solid mechanics
- Structural mechanics
- Energy resources
- Electromechanical engineering
- Aerospace engineering
- Aeronautical engineering
- Air passenger transport engineering
- Air freight transport engineering
- Air combat engineering
- Astronautical engineering
- Avionics
- Aerodynamics
- Flight mechanics
- Propulsion systems
- Aviation studies
- Aerospace engineering not elsewhere classified [1]

However, currently JACS does not fully meet the demands of comprehensive classification of profession in the contest of higher education. Although it was edited several times (in 200/2003, 2007/2008 and 2012/2013 academic years) [2] its hierarchical system is too rigid, thus not letting new specialties take their rightful place in the classification. That is why it is planned to develop and introduce a new Higher Education Classification of Subjects (HECoS) [3] in 2018/2019 academic year. This classification will not have strict structure, being just a list of subjects with corresponding codes, which will make it easier to integrate new subjects in the system of higher education of Great Britain. Moreover, it can be used to assist future students to choose training courses more efficiently.

Another way of classifying professions is introduced by special organizations and services, which provide information considering how to become a professional in a specific field to the public and can assist in choosing an appropriate course at the university. They can also inform you about national and international professional requirements, average salary and career prospects, and even offer psychological tests for a predisposition to a particular profession [4].

Some of these services target foreign students and were even created abroad, such as Study in UK (SI-UK) created in Japan in April 2003 [5], or StudyPortals, which has data on Bachelor and Master degrees in universities of various countries, Great Britain included. Other services, however, are national, thus providing information relevant for natives, and can even be restricted to specific territory (England, Scotland, Wales or Northern Ireland) [6] or are considered a charity organization [7].

Meanwhile, we consider The Royal Aeronautical Society (RAeS) and its online information resources of highest importance to our research, as it is dedicated to career perspectives specifically in aviation industry, aviation engineers included [8].

3. Types of aviation engineers

Having analyzed all the previously mentioned sources we can define that an aviation engineer is a person who is capable to create and develop new aviation and related to it technologies using his/her knowledge of mathematics, physics, and aerodynamics in order to design new aircraft as well as to improve already existing models and their maintenance. That is why the scope of activities of such a professional is huge and can be related with numerous aviation aspects from civil airport layout to high-tech military equipment. However one can distinguish three main subgroups of aviation engineers:

- air navigation engineers;
- space engineers;
- engineers with specializations related to aviation.

Air navigation engineers deal with creating and improving aircraft that can fly within the atmosphere of Earth. Therefore the most important field of study for them is mechanics, especially the aspects considering conventional flight and modernization of aircraft like an airplane.

Space engineers work in aeronautics, designing various spacecraft such as satellites as well as auxiliary technologies that could facilitate this process.

It is worth mentioning that nowadays these two types of aviation engineer often work in collaboration and their responsibilities sometimes can overlap. However we are still able to differentiate between the main fields of study for aviation engineers, namely aerodynamics, textures and materials, aircraft power plant, avionics, astronautics etc. [9]

Apart from air navigation and aeronautics there are other fields of science that in some way have an impact on the development of aviation industry. We consider among these such subjects as mechanics, electronics, system engineering and even astrophysics etc. [10]

Such variety of specializations for aviation engineers exists due to the fact that in order to function properly and effectively, aviation companies are in need of qualified engineering personnel that can work as a team and solve a problem of any difficulty. Each member of the team should be proficient in mathematics, physics, hydraulics and have auxiliary technical and management skills. Due to that universities try to provide a wide range of subjects for students to choose from without adhering exclusively to aviation topics [11].

Higher education institutions of Great Britain offer a great scope of subjects for aviation engineers with Bachelors and Masters Degrees, adapting to ever-changing demand of labour market of aviation industry. It is worth mentioning that training duration for a Bachelor Degree is three years with an additional year for on job training. Meanwhile

Masters need to study for another year [10]. This means that after 3-5 years of studying in a higher educational institution a person can get an aviation engineer diploma and start his/her career in aviation or proceed to postgraduate studies.

Nowadays according to UCAS statistics 48 higher educational institutions provide professional training for aviation engineers in Great Britain offering different training courses, including 8 courses for foreign students, 2 courses with the option to obtain a national certificate, 44 courses based on training programs [12].

The majority of these universities offer several training courses. However, having analyzed all propositions, we can distinguish among them 4 main categories:

- general subjects courses;
- courses with narrow field of study;
- major subject with additional non-engineering subject courses;
- combined subject courses.

General subjects refer to those subjects that embrace a wide scope of topics, such as aeronautics, airspace engineering, air transport, astrophysics etc. Those who finish general subject courses have extensive encyclopedia knowledge and can change specializations within the field easily due to that fact.

Courses with narrow field of study, on the other hand, are focused on one specific aspect of aviation engineering, investigating it in great detail. One can associate it with such subjects as air mechanics, spacecraft design, space system engineering. spacecraft materials, air transport management and logistics, airport and airlines management, avionics systems, space robotics etc.

Major subject with additional non-engineering subject courses are rather widespread in universities of Great Britain. Usually additional subjects are not connected with aviation, having a somehow practical nature. Thus, an aviation engineer with Bachelor or Master Degree will also be a certified pilot or a manager, have finished self-training or self-development courses or even have experienced intensive on job training for a whole year. We suggest that this additional feature gives specialists more opportunities and increases their chances to find a better well-paid position. Moreover, these specialists have better odds to get a promotion, as they have knowledge and skills which can be helpful on the workplace despite the fact that they are not strictly required.

Courses with combined subjects are distinguished by the fact that they combine two (sometimes several) major subjects which refer to one field of study. In the majority of cases general and narrow-focused subjects are combined, i.e. electronics and space systems technologies, aeronautics combined with aerodynamics, modern materials, aircraft system design, astronautics and calculated design, physics and satellite technologies or nuclear astrophysics etc. These training courses are available mainly for Masters Degrees, as they require from a student fundamental theoretical knowledge, which can be obtained during Bachelors training.

We can conclude that combined subject courses are the most beneficial kind of education and give the greatest opportunities on the global labour market, as they ensure professional and career development and provide basis for re-qualification if the need arises. This fact is considered a great advantage, taking into account the fact that aviation industry is developing rapidly as the new technologies appear, therefore causing extinction of some jobs like air navigator or onboard engineer, who are being replaced by modern equipment in the cockpit.

4. Conclusions

All things considered we can make a conclusion, that despite different ways to classify aviation engineers according to official JACS or other classification systems designed by various education information organizations, it is possible to group all aviation engineers' specializations according to the field of study and the way the courses are structured. After that it is possible to define the most advantageous and beneficial training courses, which will provide better chances to find a job and get a promotion. We have concluded that combined subject courses, which are mostly available as a Master's Degree course, are the most relevant nowadays, because they make a person holding this degree more competitive and better suited for sudden changes and new tendencies of the profession.

The classification of aviation engineers in the system of higher education of Great Britain is highly relevant in our further investigation and comparative analysis of the main distinctive features of aviation

engineers' professional training in Great Britain and Ukraine. We suggest to use the obtained data while conducting further research of the higher education providers for aviation engineers.

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Л.П. Король

Особливості класифікації авіаційних інженерів відповідно до їх спеціальностей у Великій Британії

Кафедра авіаційної англійської мови,
Навчально-науковий інститут аеронавігації (Національний авіаційний університет, Україна, м. Київ. Пр. Комарова 1, e-mail: aamm@nau.edu.ua).
E-mail: matroskina88@gmail.com

Вступ: Стаття присвячена проблематиці класифікації авіаційних інженерів в системі вищої освіти Великої Британії. Ця тема є важливим аспектом компаративного педагогічного дослідження фахової підготовки авіаційних інженерів у вищих навчальних закладах Великої Британії. **Різновиди класифікації:** Автором було проаналізовано декілька класифікацій авіаційних інженерів відповідно до Загального класифікатору академічних спеціальностей та Служби прийому до університетів та коледжів. **Класифікація авіаційних інженерів:** В статті було виявлено типи авіаційних інженерів за їхніми спеціальностями, головними дисциплінами та типами навчальних курсів. Було визначено які типи навчальних курсів є найбільш ефективними та роблять дипломованих спеціалістів найбільш конкурентоспроможними на світовому ринку праці. **Висновки:** Результати дослідження рекомендовано використовувати для подальшого аналізу вищих навчальних закладів, що пропонують фахову підготовку для авіаційних інженерів.

Ключові слова: авіаційний інженер; Велика Британія; вища освіта; класифікація; спеціальність.

Л. П. Король

Особенности классификации авиационных инженеров по их специальностям в Великой Британии

Кафедра авиационного английского языка,
Учебно-научный институт аэронавигации (Национальный авиационный университет, Украина, г. Киев, пр. Комарова 1, e-mail: aamm@nau.edu.ua).
E-mail: matroskina88@gmail.com

Вступление: Статья посвящена проблеме классификации авиационных инженеров в системе высшего образования Великой Британии. Эта тема есть важным аспектом компаративного педагогического исследования профессиональной подготовки авиационных инженеров в высших учебных заведениях Великой Британии. **Виды классификации:** Автором было проанализировано несколько классификаций авиационных инженеров в соответствии с Всеобщим классификатором академических специальностей и Службы приёма в университеты и колледжи. **Классификация авиационных инженеров:** В статье было выявлено типы авиационных инженеров по их специальностям, главным предметам и типам учебных курсов. Было выделено какие именно типы учебных курсов являются наиболее эффективными и делают дипломированных специалистов наиболее конкурентоспособными на мировом рынке труда. **Выводы:** Результаты исследования рекомендовано использовать в дальнейших исследованиях провайдеров профессиональной подготовки авиационных инженеров.

Ключевые слова: авиационный инженер; Великая Британия; высшее образование; классификация; специальность.

Korol Liliya. (1988). Postgraduate student. Senior lecturer.
Aviation English department, National aviation university, Kyiv, Ukraine.
Education: Master's degree in Philology, Faculty of English language, Kyiv national linguistic university, Kyiv (2009).
Research area: comparative pedagogics, professional training, aviation engineers, higher education in Great Britain.
Publications: 17.
E-mail: matroskina88@gmail.com.