

# ROADS FOR IMPROVING THE QUALITY OF AVIATION EDUCATION

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**Abstract:** *The most important element for achieving a sustainable development of aviation is human resources and the provision of opportunities for acquiring the necessary knowledge, skills and competencies. In this sense, aeronautical training schools are becoming more and more crucial for increasing productivity and competitiveness, as well as helping people realize their full potential and achieve their personal goals.*

**Keywords:** *QUALITY, ASSESSMENT, AVIATION EDUCATION, SELECTION AND TRAINING*

## 1. Introduction

The analysis of global aviation and aviation market trends shows that excellent opportunities for their realization both in the country and on the international labor market are being created. There is an opportunity to turn Bulgarian aviation education into an export industry for highly qualified aviation specialists.

This requires the provision of quality education and training of aviation specialists, which will effectively respond to the needs of key government stakeholders, students, higher education institutions and employers directly related to aviation development.

But also the education and training of aviation specialists depends on their motivation. Students expect a significant benefit from this education and how it will help them perform their work better. Here is the role of higher education institutions and trainers to create favorable conditions for this motivation.

## 2. Concept on the quality of higher education

The quality of higher education is a criterion in the rating and accreditation of higher education institutions. The concept of quality, however, often remains blurry and leaking or "by default". Quality ideas can be grouped into several categories, the most important of which are [10]:

- quality as consistency of designation,
- quality as an outstanding achievement;
- quality as a faultless one;
- quality as a transformation;
- quality as a threshold or accented medium level;
- quality as a continuous improvement.

According to J. Juran, the author of the Annual Quality Improvement (AQI) concept, which develops the famous "spiral of quality," "quality is an outgrowth of results that has already been achieved, and is related to man's desire to achieve new records." [12]

According to the specialists, quality is a complex multidimensional set of properties and characteristics of higher education (university, specialty, training program) that give it the ability to satisfy determined or supposedly dynamically changing requirements for it. [5]

Quality is as good as the difference between dynamically changing requirements and the results obtained from the educational site is smaller and the faster it is overcome.

This understanding of quality is also taken into account by the National Evaluation and Accreditation Agency, which measures it as a compliance of the state of the site with the requirements set by it.

## One of the main issues is "What requirements should a given educational establishment or aviation specialist meet?"

The answer is not simple and should start from the strategic goal (at least for the EU) "to achieve a high quality of life by increasing the potential of human resources in the context of a dynamic knowledge economy and sustainable socio-economic development" [1]; through the mission of higher education "to satisfy the personal and social educational, scientific, professional, qualification and cultural needs of every person throughout his life, in order to achieve his effective professional and personal realization in the society of knowledge" [2].

It is not possible to give a comprehensive answer to quality measurability if one of the most distinctive features of modern higher education is not taken into account - the diversification of higher education from which the different missions of higher education institutions and their professional fields derive.

Diversification - structural, programmatic, in form and purpose - is not an end in itself. It is a consequence of the diversified economic, social, scientific, technical and cultural needs - public, market and personal. In order to stimulate economic growth, it is necessary not only to increase the number of students but also to prepare them adequately for their needs. The "educational pyramid" of society is rising, and its degrees become more and more diverse.

When the European Commission's Program for Advanced Higher Education [10] states that by 2020 more than 35% of all jobs in the EU will need a high level of qualification, it is intended to include in this heading all types of higher education. In this context, it is pointless to question whether higher aviation education should provide a qualitative fundamental preparation that is orientated towards the next 10 years, or a qualitative preparation for today's public practice and the labor market. The question is solved by negating the alternative. **The answer is both one and the other.**

## 3. Assessment of the quality of aviation education

There is no unambiguous definition of quality education. Every world organization has its own definition, trying to unequivocally fix the most important characteristics of an education that is capable of guaranteeing the highest results. Irrespective of the differences, in the definitions two elements are present in them:

- The ability of the individual to understand and orient in the environment, which determines the cognitive development of learners as the main goal of all educational systems. Orientation is a major goal in all education systems; the success the systems achieve is an indicator of their quality.

- The role of education to promote and promote the values and attitudes of civil consciousness and to promote the creative and emotional development of the learner in a spirit of peaceful coexistence, security and civil responsibility; equality and continuity of cultural values throughout the generations.

Quality in aviation education can also be seen as the extent to which a set of properties and inherent characteristics (status and

results) of the object being evaluated (unit, structure, process, activity) corresponds to a dynamically changing goal, need or expectation mission of the higher school, academic standard, specialty or discipline goal, etc.). Quality is at the heart of aviation education. It influences what learners are learning, how well they learn, and what benefits they have from this education. Seeking a guarantee that trainers will achieve good learning outcomes and acquire knowledge and skills to help them play a positive role in society is a matter of political agenda in almost every country. Bulgarian military aviation education has already seen the correctness of this in the distant past. In all classes in which the training of the jankers in the Military School of His Majesty takes place, a consistent, purposeful and strictly sophisticated system of exams is set up and operates continuously throughout the duration of school education. [6]

The assessment may be considered as an established market value of the benefits or classification of something or someone in consideration of its value. It is the result of an act of judging or assessing a person, situation or event. Assessment is a process used to measure the performance or performance of a system or its elements. It is used as a all-inclusive term to denote any of the following activities: audit / review, performance appraisal, review of management systems, review or peer review (review by professionals, peer review), revision or monitoring.

Assessment is the systematic acquisition of information and feedback on the use, qualities and impact of an object, program or process in relation to expected outcomes [9]. It is seen as a process measuring the extent to which the expected learning outcomes have been achieved. In the context of education and training, assessment is a systematic method of gathering information on the impact and effectiveness of learning. Does the result show that the objectives set have been achieved and can give a sense of quality and help improve the learning process. Assessment is a process of characterizing and evaluating different aspects of educational activity, and these are:

- quality assurance - continuous attention to quality, keeping in mind and improving it. One of the tools in the area of quality care is its assessment.

- maintaining quality - such as managing it, keeping it in constant consistency with the goals and academic standards, and constantly updating them due to changing market and consumer demands.

- improving quality - a part of its management aimed at enhancing the ability to meet quality requirements.

Quality assessment defines any structured activity that determines the quality of the education and training process and the acquisition of knowledge and / or research, while self-assessment and / or evaluation by an external expert. In education, quality assessment involves determining (usually quantitatively) the achieved level of quality by adopted methods, mechanisms, criteria and indicators, as well as a review of the status of a unit or activity in order to establish the level of quality achieved. Every educator who provides an educational service is interested in doing so in the best possible way, to attract the most users, to provide the highest quality service. Of course, this can be understood after getting an evaluation. This assessment can be: self-assessment; assessment by users, students; assessment by colleagues in the team in which he works; assessment by the employer; assessment by the employer of his / her graduates; an external evaluation by an accreditation commission.

The criteria used to assess the activities of the higher aviation education institutions today represent a rich variety of forms in different countries and universities. Diversity depends on the different organizational and structural models of higher education systems as well as on the different funding models.

Here, it can be concluded that the quality of university activity is determined on the basis of long-term observation to take into

account the subsequent career of graduates or the impact of research on the development of society. Typically, indicators are developed for a more short-term perspective. When a complex activity is evaluated by several statistical metrics, a certain amount of information is lost and this can lead to a distorted picture of the actual state. There is a tendency for people to succumb to the influence of numbers and the importance they bear. Experience shows that, following the publication of activity assessment metrics, they are "inherently important". Using evaluation metrics is a tool for a proper judgment, not a substitute for the evaluation itself. Figures can not speak for themselves. Only data reporting is not enough; it is always necessary to interpret them.

#### **4. Approaches for determining the quality of aviation education**

In world university practice, there are different approaches to measuring and assessing the quality of higher education [9].

- *Output Control Approach* - This approach assesses the final outcome - the quality of the training of the trainees. This approach can be applied to both internal and external evaluation, for example in accreditation [5].

The Expert Committee, consisting of external to university and independent scientists and training professionals, conducts exams according to a pre-established regulation. On the scientific methods of qualification and electoral statistical control a sample of all graduating students in a given specialty (Training Program) is taken. The students' knowledge, skills, values, competencies and attitudes are examined, and their achievements (publications, developments, creative events) are introduced. In the case of a specialty, it receives accreditation when a certain proportion of the students under examination (eg 80%) meet the established standards for general, fundamental, general vocational, special and specialized training.

The disadvantage of the method is the strong dependence of the results not only (and often not so much) on the skills, creativity and input to the students' preparation but on their pre-training and personal qualities. Therefore, output control can not be indicative of the contribution of the university and academic staff to the quality of education.

Two examples:

- A large number of trainees have a good in-service training for computers. By controlling the outcome of their training in the IT / IT course, they receive high marks that are not a testimony to the new knowledge and the quality of the training course;

- Higher school of local significance, which has a weak competition at the entrance, will hardly give a good result at the exit. On the contrary, universities with attractive majors and old glory who have many and strong candidates will receive an undeservedly high score even at the time when they did not add much in their training during their training.

- *Value Added Approach* - A more equitable approach to evaluation is the so-called added value [8]. Methods of control at the level of the preliminary (incoming) preparation of the students are established. Input control is performed. After finishing the training, the result is controlled at the exit. The difference is the so-called. value added. The higher the score for the team responsible for the quality of the discipline or program is higher. Because it is not so important what the learner's entry level was, how much new knowledge and new applicable skills and competences are accumulated during the training. The disadvantage of this approach is the need for a reliable system of credible input and output preparation and determination of the difference. To this end, science-based methodologies for verifying the knowledge and skills of input and output should be developed. With a one-time exam or test, reliability can not be guaranteed, as is the case with outbound control.

- *Step by step* - Different aspects and processes of learning (academic composition, learning content, material basis, organization and course of the learning process, examination procedures, etc.) are evaluated, the overall value and importance of which determines the quality [8]. It monitors whether all the steps that pass and control the training are done properly. If they are done in the best possible way, the best results at the outputs, which do not necessarily have to be controlled, can be expected. This approach is conceptually close to total quality control. It is also applied in ISO quality control standards. His application at the higher school means that there is no need for special attention to what the entrance is and what the outcome of the given subject is, since everything "inside" is done in the best way, "creating" quality. The disadvantage of the approach is not always the clear connection of the quality being sought with the criteria on which the judgment is judged for its level and hence sometimes the erroneous assessment of the object. Many of the activities, processes, and phenomena in the university appear to be more positive (in terms of "paper") than they really are.

### **5. Factors on the basis of the quality of aviation education and training.**

Obviously, the quality of education and training depends on many interrelated factors, some of which are priorities for the market competitive environment:

#### **First. Quality policy**

In Bulgaria, there is no established state policy on the quality of higher aviation education. It is true that the Higher Education Act requires each higher education institution to have an "internal system for assessing and maintaining the quality of teaching and the quality of academic staff" [11], and the control is entrusted to the National Evaluation and Accreditation Agency. However, this does not negate the need for state policy and related resource quality assurance.

Higher aviation education is one of the few areas of public life left behind by the 28 years ago, where the natural law on supply and demand has limited effect. The existing regulatory base keeps the development of the market environment, which presumably "gives birth" to quality. There is still a resource-oriented model of institutional funding for state higher education institutions, which provides a state subsidy for the maintenance of normative training for a learner. For the budget subsidy, it is not important what kind of product the university offers and whether it is sought and the number of students. As a consequence, requirements for admission, training, examinations, etc. are reduced.

In order to protect their state and budget, Higher Education Schools also abusively detain unprepared students. Competition is conducted in another field - "number of students at the entrance". Stimulating the "cylinder principle" (as they came to the university - so out of date) and not the "funnel principle" (no matter how many come in, the important thing is that only the well-trained ones get out of the way). Higher schools compete not on the basis of the quality they give at the exit but on the number of students they accept. It is the responsibility of the university to create conditions and prerequisites for good preparation, to motivate the student. But it is not his problem if he does not meet the high requirements. The mechanism of the funnel must work without the economic pressure to expand it.

The beginnings of state policy in this regard are already the rating of professional trends and differentiated subsidies, which are given to the best. For all, however, the question remains whether the assessment tool and methods of measurement are true whether it is done in scientific methods.

It is obvious that the state has something to give to the "unleashing" of market forces in the conditions of balanced regulation.

### **Second: Financing Higher Education.**

Higher education across the world faces serious funding difficulties. They are the result of a combination of rising costs and static or even declining revenue in the sector. The reasons for the scarcity of financial resources can be sought in several directions: [4]

- increased participation of the population in higher education, expressed through the net enrollment rate of students in HEI.

- the tendency for average costs in higher education to grow faster than the average cost of the economy;

- limited revenue in the higher education sector. In most countries, the volume of higher education funding is even rising, this is usually at a rate lower than those with increasing costs. The slow increase in higher education funding is due to competition and the prioritization of other public sectors;

- aviation education and qualification of aviation specialists require the mobilization of a significant amount of financial resources. Responsibility for the study, development, evaluation and implementation of the various financial instruments and schemes to secure this resource from domestic and foreign financial institutions or from the private sector through alternative funding paths is the responsibility of the state.

#### **Third: Role of the market**

New theories of growth have a major impact on the development of public sector management. More and more methods and approaches for private sector management are beginning to find application in various public systems. These processes also affect the higher education sector. The reason is the nature of higher education as a good. Carefully examined, higher education has a number of characteristics typical of private, not public, goods. In the higher education, the characteristics of competitiveness (limited supply) and divisibility (supplied against a certain price) of goods are manifested.

In addition, the users of the higher education service are well informed, in many cases better than the suppliers themselves, which is a prerequisite for the effective operation of market forces. The perception of higher education as a service of receipt, which should be paid by the consumer, irreversibly alters the relations between the main actors in the system - state, educational institutions, learners, business - turning the latter two into a major driving force for long-term development of the sector.

#### **Fourth: The motivation of the learner**

A very important factor for the quality of higher education is the learner's motivation. It makes him carefully select his specialty because he thinks economically motivated for his future realization (which is not a fact now). And as soon as it is realized in its specialty, it strives to improve its preparation. It also puts pressure on its teachers for up-to-date knowledge and applicable skills. It is about the mass trainee, not the small percentage of truly internally motivated learners who learn and achieve high results and without external (financial) motivation. An even more immediate impact on the learner's motivation may be the way of self-financing of his / her education. Students pay graduate fees depending on their success during the previous school year. Prize-winners are taught free of charge, and the average trainees pay the full amount. This requires a strong and direct link between the quality of learning and the learner's success, i.e. objective assessments that adequately reflect not only the knowledge but also the applicable skills, values, competencies and relationships that are needed by the prospective specialist to be fit for employment in the knowledge based economy. In this way, quality management systems will work more efficiently. The model will be welcomed by the business, as its future human resources will be better motivated and quality prepared according to its needs. An effective link is created between

the results of higher education and the requirements of the labor market.

This will reduce the share of learners studying at the expense of the state "for diploma" and unwanted majors without the intention to apply them. Weak and unattractive higher schools and professional fields will remain with some trainees. In order to survive, they will unite and group together naturally, which will solve the problem of the ineffective higher education network (unaccountably administratively).

It should be noted that the implementation of incentives in our military education system, and in particular in the field of aeronautical specialists, has gained experience in the 40s of the last century. It uncovers a well-thought-out and flexible system for the preparation of technical staff for the needs of the Air Force. It is based on a consistent and precise selection among candidates with the necessary education. Placed in a suitable environment to prove their professionalism, at a later stage, they are given another opportunity to refine their knowledge and training and to grow up in the service hierarchy. In such a combination of professionalism and further stimulation and development of the acquired knowledge, habits and skills, a well-prepared theoretical and practical personnel base is obtained [7].

## 6. Conclusion

In a certain way, the quality of higher aviation education can be defined as the level and degree of usefulness of complex learning and research. Managing this utility implies bringing quality to a higher level and keeping it in line with labor market needs (above all national / high quality aviation professionals). All this calls for the establishment and maintenance of a comprehensive quality management system for activities in aviation education institutions [3].

The aim is systematic and planned increase of the quality of the training of the aviation specialists. In concrete terms, this means:

- studying the current and future trends in demand requirements, respectively the quality of supply of aviation specialists on the labor market in the country and the world;

- quality management of the elements of the educational cycle in the two main and parallel courses: first - admission, training and realization of the graduates and second - learning process, research process and additional complex service process / choice of scientific directions and specialties, organization of contemporary teaching, marketing the created educational product, etc .;

- maintaining two coordinates in quality management: systemic design, implementation and improvement of the mechanisms of functioning of the aviation education institutions and complexity in covering the factors of reproduction of the educational product - cadres and research;

- diversification of the educational product in the aviation education institutions in view of market requirements and elimination of non-conforming educational services and scientific products;

- precise selection of training contingents, teaching staff, service staff and building and maintenance of a modern educational and material base, which meets the modern requirements;

- scientific service of the processes for improving the quality of the activities related to the training of aviation specialists;

- a clearly defined vision of market behavior of aeronautical education institutions, incl. first, moving from a product-oriented to market-oriented management approach; secondly, business relations with the aviation business, public administration, users of educational products, presentation of the created goods, etc .; thirdly, strengthening the capacity of the educational institution to

implement strategic management; fourth, maintaining a quality enhancement and quality control system, etc .;

- harmonization of activities with those of the European Educational Area, which is expressed in: mobility / of students and teachers /, harmonization of educational content, mutual recognition of diplomas, etc .;

- urgently organizing continuing further training, in line with dynamic labor market developments;

- effective use of the available resources of the higher education institution.

Quality control is becoming a priority of aviation education as a factor of social and cultural engagement and economic potential. In modern Bulgaria, the guarantee of quality education of aviation specialists is a key factor for the development and efficient functioning of the aviation sector as a whole. For this reason, European quality education criteria must be applied to ensure the process of adequate assessment with the subsequent provision, maintenance and improvement of quality in higher aviation education.

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