Exploration of UAV Application Skill Competition and Talent Training Mode of UAV Application Technology Major

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Abstract: By 2035, China will gradually establish an unmanned air transportation service system covering manned air transport, and form a batch of unmanned aircraft enterprises that are in an international leading position in the fields of aviation manufacturing, flight monitoring and operation, etc. In January 2022, the Civil Aviation Administration of China (CAAC), the Development and Reform Commission (NDRC), and the Ministry of Transportation (MOT) jointly issued the "14th Five-Year Plan" for the Development of Civil Aviation. Plan, proposing to accelerate the technological innovation of drones, improve relevant laws and regulations, and carry out high-quality services to realize the positive and innovative development of the drone industry. In February 2020, China added 16 new occupations, of which "drone installation and maintenance worker" and "drone pilot" have been officially included in the National Occupational Classification Catalog. The article discusses the drone application skill competition and the talent cultivation path of drone application technology for related personnel's reference.

Keywords: Drone competition; Education; Drone technology; Talent development

Introduction

Motivated by the vigorous promotion of supportive policies for the rapid development of drone technology, schools have assumed the task of cultivating outstanding talents in the field of technological innovation and comprehensive applications, accelerating the cultivation of high-end talents in the field of drone applications. Since 2018, a number of colleges and universities have opened drone majors and conducted corresponding competitions in the industry. The detailed content of the competition provides a basis for the construction of the experimental program, and the competition rules and evaluation guidelines optimize the experimental program. Through the reform of the curriculum system of drone application technology, its teaching quality has been further improved.

1. Status of Drone Application Skills Competition

In 2015, Sohu founded the Drone Image Selection Competition, which reflected the competitors' flying skills, material selection, editing, etc. The first Drone Application Skills Competition founded in 2018 was built on the Belt and Road & BRICS Skills Development and Technology Innovation Competition, and the organizer was a company that has long been committed to the school-enterprise cooperation in the drone industry - -Far Ocean Aerospace Technology (Tianjin) as the organizer. The UAV Creative Design Competition founded in 2019 is an event organized by the Innovation Alliance of China's drone industry, bringing together many well-known domestic enterprises and professionals to participate in the competition, which will focus on the direction of application in the field of precision logistics of drones. The next few sessions of the Application Skills Competition and Drone Creative Design Competition are closely related to industrial applications. In the 2021 Belt and Road and BRICS Skill Development and Science and Technology Innovation Competition, a design and innovation competition has been added. Participants can design and present the electric system of the drone according to their load, and the presentation includes the theoretical basis of the product, the design basis, the basic function description, and the positioning of the future use scene. The traversing machine race started relatively late in China, and has been gradually carried out since 2018, and has been divided into two main categories, one is the competition category and the other is the skill category, and the main competitions are DRL, WDG, X-Fly, etc., which include speed, endurance, fancy performances and other skills, which are popular among Chinese and foreign travel enthusiasts. In 2020, the competition was held on the theme of UAV field flight and internal data processing, and the aerial photogrammetry competitions, such as the "Southern Painting Cup" and the "C&W Cup" competitions, were mostly based on the research of tilted aerial imagery monolithic monolithic 3D modeling, naked-eye 3D surveying and mapping, naked-eye 3D point cloud data processing, and so on. Most of the research has been carried out on monolithic 3D modeling of tilted aerial images, naked-eye 3D mapping, and UAV airborne LiDAR point cloud data processing.

Although the scale of universities and participating teams is large, the above mentioned activities and specific contents are covered.

2. UAV Application Skills Competition and UAV Application Technology Professional Talent Cultivation Pathway

2.1 Promote learning by competition and explore multiple ways of school-enterprise interaction

Since the beginning of 2018, this colleges have been deeply cooperating with enterprises. The colleges and enterprises aim at cultivating high quality, deep integration of industry and learning, school-enterprise cooperation and win-win cooperation. At the same time, the school actively cooperates with enterprises to train students through various ways and establish an innovative faculty with independent intellectual property rights. The cooperative enterprises have sent senior engineers to study and carry out teaching work for many times, providing ideas and guidelines for students' innovation and entrepreneurship, skill competitions and other activities. In participating in the competition, it should be deeply realized that in order to better promote the development of the specialty of UAV application technology, it is necessary to closely link the classroom teaching with the market development and the needs of the enterprises, to continuously improve the talent cultivation program, and to enhance the employment competitiveness of the students.

2.2 Organize more skills competitions at the college level to create a competition atmosphere

Based on the concept of "promoting learning by competition, promoting training by learning, and combining competition and teaching", the college organizes an intercollegiate skills competition every semester to stimulate students' learning interest and create a good environment for students to respect skills and talents. Skill competitions should cover a wide range of skills. On this basis, teachers should encourage students to actively participate in skill competitions and raise their awareness of skill operation. In addition, schools should give full play to the role of competitions and use skills competitions as a "whetstone" for training talents and serving society. Schools should encourage students to set up drone-related interest groups or clubs. Students majoring in UAV can set up student UAV clubs according to their own professional characteristics. According to the school's curriculum system, teachers actively guide students to set up interest groups, determine the principle of drone flight, fixed-wing group, multi-rotor group, aerial photography group, formation flight group, etc., and determine the team leader. Club members are free to choose their own teams after they have a preliminary understanding of the groups. Under the leadership of the leader, the club members regularly carry out training in theoretical knowledge, flight training, maintenance, etc., and take the initiative to improve their learning ability and management level.

2.3 With the purpose of competition, actively support and organize college students to participate in drone competition and independent entrepreneurship and innovation

In teaching, teachers should pay attention to cultivating students' interests and hobbies, selecting thoughtful and capable students, and taking the initiative to provide students with learning opportunities, so as to enable students to enter into a higher level of professional fields. In the usual teaching process, as competition instructors, they encourage and organize students to participate in national, provincial and state-level drone competitions. Students are also encouraged to participate in school-organized science, technology, research programs, and start businesses. Students are encouraged to rely on their clubs for the development and operation of drone projects, including the mapping of personalized parts for 3D-printed drones, customization and debugging of drones, customization and debugging of multi-rotors and fixed-wings, outdoor aerial photography, and the design and manufacture of drone trajectories as required. In addition, we should pay attention to the creative thinking and practical operation of students, and guide them to formulate appropriate business strategies and concepts, and enhance their organizational and decision-making abilities. Teachers should summarize the experience of the competition, integrate the innovative practical content and research into the teaching of related professional courses, and conduct in-depth analysis and discussion on the teaching mode of "promoting teaching by competition, promoting learning by competition, and combining competition with classroom teaching".

2.4 Promote teaching with competition to further improve teachers' professional skills and technical level

In the classroom, teachers should not only have solid theoretical skills, but also pay attention to the practical and professional nature of the classroom. In the actual teaching process, teachers need to constantly update their educational concepts and explore their teaching methods in order to better fulfill the classroom teaching tasks. Since the beginning of 2020, China's economic growth has been slowing down, and there are many inconveniences in people's travel. Due to the lack of communication with schools and enterprises, the sensitivity of teachers to the development of this emerging drone industry has become slow, and the problems of low innovation in teaching methods, lagging behind in the updating of classroom content, and insufficient optimization of information have appeared. The teaching concept of "promoting teaching by competition, promoting learning by competition, and combining competition with classroom teaching" has put forward higher requirements

for teachers' professionalism. Colleges and universities should take the competition as an opportunity to speed up the construction of "dual-teacher teams" in order to better move forward to the market-oriented talent training goals.

3. Conclusion

In summary, school students' rapid theoretical and practical abilities have been greatly improved by participating in competitions in the related UAV industry, and teachers' professional vision, judgment and teaching ability have also been greatly improved. After instructing students to participate in skill competitions, teachers are more concerned about updating their teaching methods in a timely manner, paying more attention to the connection with enterprises, and can keep abreast of various competition websites as well as the latest developments in the industry. By participating in various competitions, teachers have been promoted to research and explore new teaching modes of teaching competition and teaching, competition and learning, and competition and classroom teaching, so that the school can keep abreast of the times.

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