Construction of Professional Curriculum System of UAV Application Technology based on Core Job Competence

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Abstract: In the field of UAV application technology, core job competence is an important standard to measure the quality and ability of professional talents. The construction of the curriculum system based on core job competence is aimed at clarifying the skill requirements and competence standards of core jobs, providing students with systematic and targeted teaching content and practical training, so that they can have the core job competence to meet the needs of the industry and be competent for future career development. Based on this, the following is a discussion on the construction of the curriculum system of UAV application technology specialization based on core job competencies for reference.

Keywords: Core job competencies; Drone application technology; Professional curriculum system; Building strategy

Introduction

As an emerging field, drone application technology shows a vigorous development trend and has become the focus of attention in all walks of life. In order to better cultivate and train UAV application technology professionals, it is especially urgent to build a curriculum system based on core job competencies. Aiming at the ability requirements needed for students to engage in drone-related core positions in the future, building a curriculum system that meets the needs and development trend of the industry will help to improve students' practical operation ability and occupational competitiveness, and promote the education and development of drone application technology majors.

1. The Importance of Core Job Competencies to the Curriculum System of UAV Application Technology Specialization

Together they form the basis and orientation of the design of the curriculum system of the specialty. Core job competencies are the starting point for the design of the curriculum system of UAV application technology specialty. These competencies usually cover skills in UAV operation, maintenance, debugging, application development, etc., and are the key competencies that students must master in their future jobs. Therefore, the professional curriculum system must be constructed closely around these core job competencies to ensure that students can acquire the necessary skills and knowledge through learning. The core job competencies determine the setting and content of the curriculum system. By analyzing the needs of core job competencies, the required professional basic courses and core courses can be determined, such as introduction to UAVs, flight regulations, handling technology, structure and system, flight control technology and so on. The contents of these courses should be closely related to the requirements of actual jobs so that students can gradually master the required core skills in the learning process. Core job competencies also influence the choice of teaching methods and teaching tools. In order to cultivate students' practical ability, the curriculum system should contain enough practical links, such as experiments, practical training and internships. At the same time, teaching methods should also emphasize the combination of theory and practice, and adopt teaching methods such as project-driven, so that students can learn and master core job competencies in practice. When constructing and improving the curriculum system, the needs and characteristics of the core job competencies must be fully considered to ensure that the curriculum system can cultivate high-quality talents in line with the requirements of the industry.

2. Problems in the construction of curriculum system of UAV application technology specialty

2.1 Disconnect between teaching content and industry demand

In the construction of the curriculum system of UAV application technology, a common problem is the disconnection between teaching content and industry demand. Outdated teaching content, lack of practical application, and a knowledge structure that is out of line with technological development have led to a mismatch between what students learn and the requirements of actual positions. This disconnect will lead

to students not being able to adapt smoothly to the work environment after graduation, affecting their career development prospects. There is a gap between what students learn in school and what they actually need to work, which makes it difficult for graduates to meet the real job requirements when they are looking for a job, and increases the training and cost investment of enterprises. Disconnected teaching content also affects students' interest and motivation, reducing their enthusiasm for learning, which in turn affects students' learning effectiveness and comprehensive quality improvement.

2.2 Insufficient practical sessions

In the curriculum, the excessive focus on theoretical teaching and the lack of practical operation and the design of practical projects lead to the lack of practical operation experience and skill cultivation of students. This makes students unable to really master the practical operation skills in the field of UAV application technology, which limits their development and application ability in the workplace. The impact of insufficient practice sessions is reflected in the following aspects: students lack practical experience and skill development, and are unable to transform theoretical knowledge into practical application ability, reducing their performance and competitiveness in the workplace. The lack of sufficient practice opportunities also leads to students' lack of deep understanding of the industry and their inability to quickly adapt to the ever-changing work environment, which increases the difficulty of employment.

2.3 Unreasonable structure of the faculty team

In the construction of the curriculum system of UAV application technology, the structure of the faculty team may have deficiencies in technical level, teaching ability, practical experience and so on. Some teachers may lack the latest industry dynamics and technical knowledge to update the teaching content in a timely manner; other teachers may lack practical experience and opportunities to cooperate with enterprises to effectively guide students in practical operation and practice projects. Students cannot get timely updated and professional guidance in the learning process, which affects their in-depth understanding and application of professional knowledge. The irrational structure of the faculty will lead to the teaching quality not being effectively guaranteed, affecting the learning effect and educational experience of students.

3. Strategies for building a professional curriculum system for UAV application technology based on core job competencies

3.1 Redesign the course content to match with the industry demand

Schools should regularly invite experts in the field to participate in curriculum design, refer to the latest development trends and technical requirements of the industry, and update the course content and introduce practical examples in a timely manner, so as to ensure that the knowledge learned by students is closely aligned with the needs of actual work. Take a UAV-GIS course as an example, the school can adjust the course content with the industry demand. For this course, students need to master the principles of UAV aerial photography, remote sensing image processing technology, GIS applications and other knowledge. Schools can improve their practical skills and career competitiveness by cooperating with geographic information companies, offering practical courses and organizing students to take part in real projects, such as forest coverage surveys or aerial photogrammetry for urban planning, so that students can have first-hand experience of and learn about the latest technology and practical operations in the industry. By re-designing the course content to match the industry needs, the College can make the courses closer to the actual work demands, help students better master the necessary skills to meet the industry needs, and improve the employment competitiveness and development potential of the graduates.

3.2 Strengthening practical teaching

Strengthen the practical teaching link to provide students with more hands-on opportunities and practical programs. Through the establishment of laboratory facilities, the creation of additional practical courses, and the expansion of internship opportunities, we help students expand their practical experience and skill development, and enhance their comprehensive quality and competitiveness. For example, in the course of aircraft design and manufacturing, the school can set up an experimental class on the production of aircraft models, so that students can design, manufacture and test the aircraft models with their own hands, and exercise their hands-on ability and teamwork spirit. At the same time, the school can also cooperate with UAV enterprises to provide students with internship projects, so that they can have the opportunity to participate in UAV design, structural debugging, data analysis and other practical work in real projects, and accumulate practical experience and industry recognition. By strengthening the practical teaching link, the school can help students transform theoretical knowledge into practical operation ability, enhance their problem-solving and innovation ability, and lay a solid foundation for their future career development.

3.3 Optimizing the structure and capacity of the teaching staff

Schools can take measures to optimize the structure and capacity of their teaching staff and improve their technical level, practical experience and teaching ability. By strengthening teacher training and encouraging teachers to participate in industry research and practice programs, schools can effectively improve the overall level of their teaching staff and provide better teaching services. For example, schools

can invite senior industry experts to conduct teacher training to introduce the latest technological developments to teachers and enhance their professionalism and practical experience. In addition, schools can encourage teachers to participate in industry cooperation projects, so that they can personally participate in actual operation and project management, and enhance their understanding of the industry and their practical ability. These initiatives can help teachers better instruct students, improve teaching quality and students' comprehensive quality, and enhance the educational effectiveness and competitiveness of the UAV application technology program. By optimizing the structure and capability of the faculty, the school can effectively enhance the quality of teaching, meet the needs of the industry, improve the employment competitiveness of graduates and the reputation of the profession, and promote the sustainable development and growth of the UAV application technology profession.

4. Conclusion

The curriculum system of UAV application technology is built to effectively train and create more excellent UAV application technology talents to meet the urgent needs of industry development. By establishing a curriculum system based on core job competencies, students will be able to comprehensively master the skills and knowledge required for core jobs, have the ability to solve problems and make innovative applications, and make positive contributions to the future development of the field of drone application technology. Let's make concerted efforts and work together to build a high-quality professional curriculum system of UAV application technology to help the industry's prosperous development and innovative progress.

References

[1]   YANG Guowen, ZHOU Han. Countermeasures for the teaching reform of core curriculum of UAV application technology major buttressing the vocational standard[C]// Journal of New Curriculum Research. Focus on the new curriculum reform to promote the high-quality development of education Proceedings (I). Hunan Institute of Industry and Trade Technician, 2023: 2.

[2]   Wang Ancheng, Li Jiansheng, Guo Yuyan et al. Exploration and practice of practical teaching mode of UAV technology and application course[J]. Surveying and Mapping Bulletin,2022,(S1): 119-122.

[3]   Dai Huabing. Design and implementation of microcontroller course for UAV application technology[J]. Journal of Beijing Institute of Industrial Vocational Technology,2021,20(02): 90-94.