Process Evaluation System of Theoretical Courses of Photogrammetry and Remote Sensing Technology Specialty in Higher Vocational Education

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Abstract: With the development of science and technology, the application of photogrammetry and remote sensing technology has become more and more extensive. Currently, our country has carried out many types of research projects. Photogrammetry and remote sensing technology are used as basic techniques and search methods, and they play an extremely important role in investigations. In the context of current social needs, this paper studies the process evaluation system of the theoretical courses of photogrammetry and remote sensing technology, so as to combine the existing higher vocational talent training system with social needs, and the majors required in higher vocational education Skills and abilities are better aligned. By linking the work requirement process with research and practice, the development of the theory and practical education system of photogrammetry and remote sensing technology for higher vocational education is discussed. This article analyzes the problems in higher vocational education in professional theoretical teaching of photogrammetry and remote sensing technology, and analyzes the professional process evaluation system. Research the course evaluation system through practice, and reform and develop in the higher vocational photogrammetry and remote sensing technology system. Experiments show that the research as a process evaluation system is effective for improving the quality of the teaching courses of photogrammetry and remote sensing technology in higher vocational education.

1. Introduction

In recent years, with the continuous advancement of national higher vocational education construction demonstration projects, the establishment of photogrammetry and remote sensing technology has also made significant progress, and the training conditions and environment have been significantly improved [1]. The creation of a theoretical course evaluation system for photogrammetry and remote sensing technology involves two aspects: the establishment of on-campus laboratories, the establishment of off-campus learning centers, and the reform of traditional curriculum teaching methods [2]. Higher vocational photogrammetry and remote sensing technology training has been unable to meet today's social demand for continuous development, integration and innovation in skills. In order to meet today's society's increasing requirements for photogrammetry and remote sensing technology talents, the talent training system of higher vocational education needs to realize the construction of a modern higher vocational teaching system, and conduct in-depth research on the new photogrammetry and remote sensing technology theoretical course evaluation system[3]. Photogrammetry and remote sensing technology is now an important field. It combines many technologies, including computational mathematics, pattern recognition technology, sensor technology and aerospace science. The fusion of several disciplines has brought photogrammetry and remote sensing technology into a rapidly developing New era [4].

The society increasingly needs innovative and practical talents in the field of photogrammetry. However, under the existing higher vocational curriculum system, due to the low level of basic knowledge and the low learning ability of vocational education and training students, the theoretical content of the course is not Easily accepted and difficult to achieve the expected learning effect [5]. Applied education is the basis of practical training in the higher vocational education system. It is the specific application of professional knowledge and skills in practice. As long as students master the basic theories and basic theories in a simulated situation or in the actual working environment of

the enterprise, they will learn to apply [6]. In this process, the professional knowledge of educational activities can be further expanded and deepened. The traditional training program for photogrammetry and remote sensing technology talents poses two main problems: First, the traditional teaching model has the content of teaching teachers The phenomenon distinguished from commercial design, it cannot fully reproduce the initiative of students, which is easily affected by the lack of teaching experience of teachers, the complexity of teaching materials and the lack of interested talents. Second, some teachers in higher vocational colleges will continue to give priority to lectures, and to a large extent ignore the dominance of students [7].

Under this kind of higher vocational teaching system, students passively accept knowledge, coupled with the weak theoretical foundation of students, which limits the level of students' thinking about problems, and their initiative and creativity will be reduced [8]. Regarding the quality and effectiveness of photogrammetry and remote sensing technology in higher vocational teaching, this form of training must adapt to the characteristics of higher vocational colleges and the conditions of students to varying degrees [9]. At present, national research in the field of photogrammetry and remote sensing technology is limited to reforming the model of professional development and talent training. Education and teaching research is only applicable to research and cartographic engineering majors. Most research and surveying are research topics, and applications for high-level students There are few ways, especially in higher vocational colleges. However, photogrammetry and remote sensing technology put high demands on the cultural and professional qualities of students. Therefore, for today's higher vocational education colleges, it is necessary to reform the curriculum system of the professional theory of photogrammetry and remote sensing technology, and establish a process evaluation system for the curriculum [10].

2. Method

1) Mask R-CNN algorithm image under remote sensing technology

In order to realize the photogrammetry function through remote sensing technology, the mask R-CNN adds a mask loss function to the classification loss function and the recognition frame loss function. The RCNN mask allows the network to generate masks for different target categories and between different categories. Does not cause any inconvenience. The classifier is used to predict the class name and to infer the mask, thus separating the classification and mask prediction.

R-CNN mask uses S-shape and bit loss at the pixel level to effectively reduce the interference between different mask types. The classification loss function is used to distinguish the various categories and backgrounds existing in the image, as shown in the formula:

$$L_{\text{cls}} = -\frac{1}{N_{ds}}\sum_{i}\log[p_i^{*}p_i + (1-p_i^{*})(1-p_i)] \tag{1}$$

2) Among them, p_{i} Is the target in the i image p_{i}^{*} It is a non-target in the i-th image. L_{box} It is the regression function of the detection frame, which is mainly used to modify the anchor point coordinates of the foreground to obtain the best detection frame.

$$L_{\text{box}} = \lambda\frac{1}{N_{reg}}\sum_{i} p_i^{*}L_{reg}(t_i, t_i^{*}) \tag{2}$$

Among them, p_{i}^{*} L_{reg} Only if there is a foreground anchor point $p_{\text{i}}^{*}=1$ Only when there is a return loss; when there is no prospect anchor point, that is $p_{\text{i}}^{*}=0$, No return loss, L_{reg} is the regression loss function, and its formula is:

$$L_{\text{reg}} = R(t_i - t_i^{*}) = |t_i - t_i^{*}| - 0.5 \tag{3}$$

Where t is the predicted target detection frame coordinates, t_i^* Is the real detection frame coordinates; σ = 0.3, used to control the smooth area of the loss function. L_{mask} In order to calculate the average of the binary cross-entropy loss, it is necessary to provide independent mask predictions for different categories of RoI, and separate the tasks of classification and semantic segmentation. The final end loss function is:

$$L = L_{cls} + L_{box} + L_{mask} \tag{4}$$

3. Methods and experimental research design

3.1 Teaching should be targeted towards students' professional skills

According to the requirements of photogrammetry and remote sensing technology, professional environment and industry requirements, course content and professional standards, education process and manufacturing process, schools and enterprises jointly develop high-quality systems, professional training standards, curriculum standards and actual training conditions under comprehensive consideration The standards and other related standards must be followed correctly. In higher vocational teaching and training, the teaching tasks of photogrammetry and remote sensing technology should be jointly formulated between school teachers and technicians or company managers, in order to increase teachers' educational potential and deal with the most advanced development trends, latest achievements, and advanced Technology, new specifications and typical technical cases, through the deepening of cooperation with enterprises, continue to expand students' knowledge and vision in photogrammetry and remote sensing technology.

3.2 Creation of talent training model

In higher vocational education, the vocational training of photogrammetry and remote sensing technology should be based on the cooperation between the school and the enterprise, the reasonable arrangement of work and study, and use the tripartism of the school, the company and the students as the basis for establishing the talent training model. According to the direction and characteristics of graduates in photogrammetry and remote sensing technology, to arrange positions for enterprises and train technical talents that can meet the needs of modern economic and social development, a curriculum system that fits the goals of talent training should be established. On this basis, a procedural system based on a process evaluation system to acquire basic knowledge was established, and vocational students of photogrammetry and remote sensing technology were scientifically and systematically trained, and practical professional skills were developed and practiced. Mutual promotion and integration of enterprise development.

3.3 Establish higher vocational education that is connected to the work process situation

For the actual implementation and theoreticalization of professional courses focusing on photogrammetry and remote sensing technology, the establishment of a scenario-matching system can rely on photogrammetry and remote sensing technology for practical applications in various research surveys across the country. Through the six-step learning method, that is, the process of creating projects, work plans, work solutions, project implementation, verification and evaluation to complete the work project, it promotes the development of students in photogrammetry and remote sensing technology, and improves the overall performance of students. Deepen the theoretical research of higher vocational education, adapt to the content of vocational education, deepen education reform, enrich the relevant theories of higher vocational colleges and talent training models, and improve the higher vocational education system.

3.4 Experimental investigation objects

In order to be able to analyze the current targeted research on the use of photogrammetry and remote sensing technology in a more in-depth manner, this article conducts a special survey of students' feelings through the mode of higher vocational colleges under photogrammetry and

remote sensing technology. It is necessary to conduct meticulous and in-depth investigation and research, study network data and laws, and refine and summarize first-hand information. This article selects students from a number of domestic higher vocational colleges to investigate the teaching mode of photogrammetry and remote sensing technology theory. From the factors of innovative teaching evaluation, teaching team building, curriculum science, and practical training mode, the photogrammetry and remote sensing technology are investigated. Conduct practical investigation and research on the technical theory course system.

Table 1. Questionnaire survey report

Questionnaire issuance and recovery	Vocational undergraduate students, vocational college students	Vocational undergraduate students, vocational college students	Vocational undergraduate students, vocational college students
Issue	300	500	800
Recycle	298	495	793
effective	295	490	785
Efficient	98.3%	98%	98.1%

As shown in the data in Table 1, this article issued a total of 800 experimental investigation reports during the investigation report link for this experiment, and conducted a questionnaire survey on photogrammetry and remote sensing technology theory courses for undergraduate and vocational college students respectively. To master the analysis of factors such as innovative teaching evaluation, teaching team construction, scientific curriculum, and practical training mode. First of all, the investigation and research method is adopted, and detailed investigation and research, research data, research rules, master first-hand information, and refine and summarize the specific case must be carried out. Secondly, using the case analysis method, this article analyzes the network behavior data of each user and analyzes the theoretical course process evaluation system. Specifically, each student compares and analyzes the evaluation of the traditional photogrammetry and remote sensing technology theory course teaching system.

4. Results

4.1 Curriculum system setting and implementation

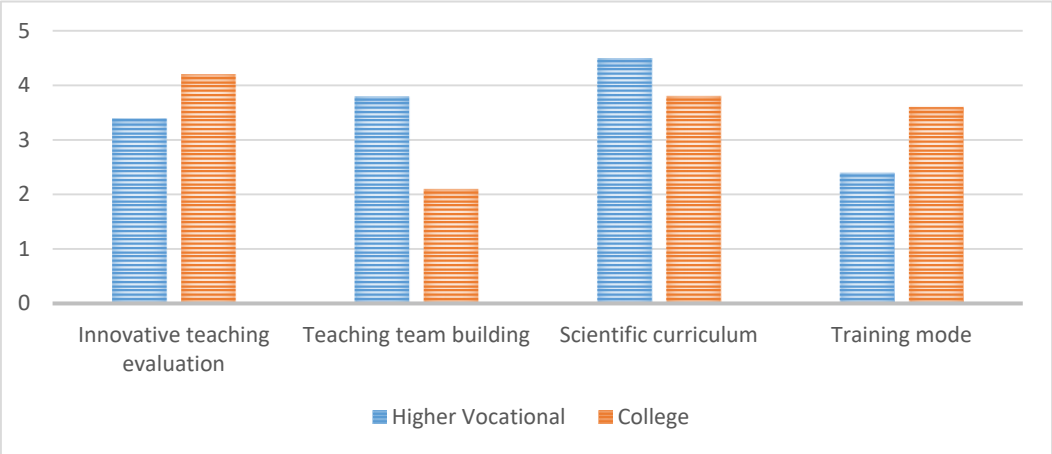

Figure 1. System comparison of photogrammetry and remote sensing technology in higher vocational colleges

As shown in the survey statistics in Figure 1, the system of photogrammetry and remote sensing technology in higher vocational colleges is different in undergraduate and junior colleges. The setting of curriculum system is an aspect that higher vocational colleges should pay attention to. The basic requirements for photogrammetry and remote sensing technology should be developed to achieve the relevant applicability of the technology and create a theoretical course system, which

should consider the social requirements of photogrammetry and remote sensing, increase the quality of practical training, and focus on developing students' core competitiveness. Application skills and overall quality. At the same time, an evaluation curriculum system should be established in classroom practice: First, higher vocational teachers should require students to master the basic professional skills of photogrammetry and remote sensing technology. In order to teach the skills of specific technical applications, students should be able to flexibly use photogrammetry and remote sensing technology. Theoretical knowledge and skills to solve practical problems. Secondly, through comprehensive technology application teaching, students must make full use of photogrammetry and remote sensing technology to analyze and manage more complex practical problems to form comprehensive skills. And the practical training of photogrammetry and remote sensing technology should run through the entire learning process of students, based on the experience teaching of various courses, with corporate internship activities as the main body, final practice as the goal, extracurricular practice as supplement, and ability Assessment is an overall structural system of practical learning.

4.2 The theory course system of higher vocational colleges should be combined with reality

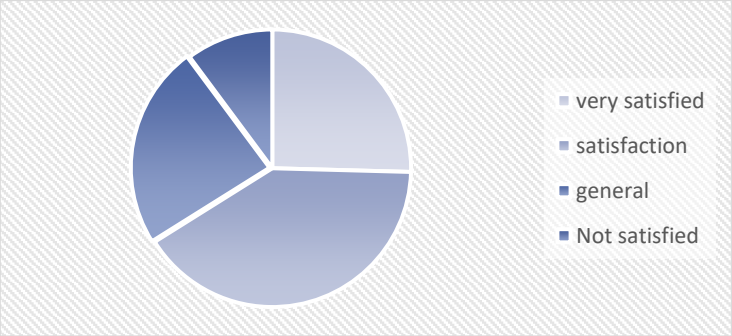

Figure 2. Higher vocational students' satisfaction with the professional curriculum system of photogrammetry and remote sensing technology in colleges and universities

As shown in the survey statistics in Figure 2, higher vocational students are not very satisfied with the curriculum system of the photogrammetry and remote sensing technology majors in colleges and universities, and "general" and "unsatisfactory" occupy a large part, which shows Current problems in the professional curriculum system of photogrammetry and remote sensing technology in higher vocational colleges. Due to the specialization of photogrammetry and remote sensing technology, the popularization of relevant basic skills and knowledge among students requires close cooperation between schools and enterprises to form a complete talent training system. The process-based evaluation system of photogrammetry and remote sensing technology courses is a new model for studying school-enterprise cooperation, and it is also a new breakthrough in school-enterprise cooperation. This new model can improve the integration of enterprises and education, consolidate the demand for corporate positions, and further improve the quality and training of photogrammetry and remote sensing technology professionals. In the process of learning and practice, the process evaluation system of photogrammetry and remote sensing technology theory courses is fully applied, so that students can fully grasp professional knowledge and meet the training of high-quality and high-requirement professional and technical personnel in photogrammetry and remote sensing technology.

5. Conclusion

As a result, the importance of photogrammetry and remote sensing technology in survey surveys is questioned. The application of photogrammetry and remote sensing technology can improve measurement accuracy on the one hand, reduce human and material investment on the other hand, and realize remote measurement functions. To make up for the complexity of traditional measurement technology. Therefore, in the context of the current era, the professional theoretical courses of photogrammetry and remote sensing technology in higher vocational colleges should

keep pace with the times, develop a new era of photogrammetry and remote sensing professional theoretical courses, and carry out effective reforms. Actively develop and innovate to enhance the effective understanding of the connotation of teaching. At present, it is necessary to conduct an in-depth analysis of the application status of photogrammetry and remote sensing technology, develop innovative technologies and methods, diversify the development of the theoretical course evaluation system, promote the development of photogrammetry and remote sensing technology, and provide a solid foundation for transformation.

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