Research on the teaching evaluation reform of agricultural eco-environmental protection specialties under the background of deep integration of production and education

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Abstract. With the implementation of the personnel training mode of deep integration between production and education, the original evaluation method cannot adapt to the goal of personnel training, so that the traditional teaching evaluation methods need to be reformed urgently. This paper studies and analyzes the four main problems in the teaching evaluation of agricultural eco-environmental protection specialties, and puts forward three measures to reform the teaching evaluation methods: establishing diversified evaluation indexes, establishing diversified evaluation subjects, and establishing diversified evaluation feedback mechanisms.

1. Introduction
With the strengthening emphasis on modern agriculture and environmental protection in China, a large number of high-skilled and high-quality agricultural and environmental protection professionals are required to take on the responsibility of modern agriculture and environmental protection.

However, the current teaching evaluation model of agricultural eco-environmental protection specialties cannot meet the needs of the society for talents, which leads to the irrational knowledge structure, poor professional application ability and innovation ability and poor vocational development ability of professional talents. How to establish a reasonable professional teaching evaluation system to cultivate high-quality professionals becomes an important issue confronting with education workers of agricultural eco-environmental protection currently.

2. Personnel Training Model of the Deep Integration between Production and Education That Promotes the Reform of Teaching Evaluation Methods
The talents training mode of the “two combinations and two integrations” of the deep integration between production and education is explored and obtained under the background of the vigorous development of higher vocational education and the reform of education, which is to better cultivate high-skilled, high-quality professionals meeting the needs of enterprises and adapting to the development of society. In the implementation of the personnel training mode of the deep integration between production and education, it is found that the original evaluation method can no longer adapt to the goal of personnel training, and the traditional teaching evaluation methods need to be reformed urgently.

“Two combinations” refers to the “combination of production and education, and combination of working and learning”. The combination of production and education refers to organically combining the school’s teaching environment, content and process with the enterprise’s production environment, technology and process in the teaching, mainly to solve the disconnection between school teaching...
and enterprise requirements. The combination of working and learning refers to alternately combining working with learning in the teaching to complete the teaching tasks, so that students can master and improve skills in the process of “learning - working - learning – working”. \[1\] The “two combinations” enable students to consolidate and deepen the understanding of theoretical knowledge, to gradually grasp the vocational skills and professional skills required by the professional positions, and to develop a strong ability to analyze and solve practical problems and the professional qualities required by modern enterprises; at the same time, in the actual working environment of internship, students can experience the professionalism personally, so as to develop good professional ethics.

“Two integrations” refer to the “integration of vocational education and entrepreneurship education, and integration of professional education and vocational qualification education”. The integration of vocational education and entrepreneurial education is to integrate entrepreneurship education into the education system of vocational and technical education, and to form an integrated teaching form overall integrating training objectives, personnel quality structure, teaching plan, curriculum setting, practical teaching activities and the like. The integration of professional education and vocational qualification education refers to the teaching form integrating professional backbone courses with vocational qualification certificate standard, integrating the content of academic education with the training content of vocational qualification certificate, and integrating classroom teaching, practical teaching and vocational qualification certificate assessment together. \[2\]

3. Key Problems in the Teaching Evaluation of Agricultural Eco-environmental Protection Specialties
Teaching evaluation is to conduct value judgments and serve teaching decision-making for the teachers’ teaching, students’ learning as well as the effect based on the teaching objectives. Teaching evaluation is the baton of teaching, and plays a guiding, regulating and identifying role in teachers’ teaching design, organization and implementation as well as students’ learning. High-quality teaching is the guarantee of high-quality talents, while scientific teaching evaluation model is the key to ensure the quality of teaching \[3\]-\[4\]. As China takes new industrialization road and the industrial structure continuously adjusts, enterprises’ requirements for technical personnel are getting higher and higher, which puts forward new challenges for the personnel training evaluation methods of higher vocational education.

| Items                  | Characteristics | Manifestations                                           |
|------------------------|-----------------|----------------------------------------------------------|
| Evaluation means       | Single          | Taking classroom teaching evaluation as the main means.  |
| Evaluation method      | Single          | Taking closed examination as the main means.             |
| Evaluation content     | Single          | Grasping the situation of knowledge points in examination materials. |
| Evaluation subject     | Single          | Teacher evaluation is the only form.                    |
| Overall result         | Single          | Cannot meet the requirements of talent evaluation and teaching reform goals. |

3.1. Single Evaluation Means
Currently, classroom teaching accounts for a large proportion in agricultural eco-environmental protection specialties, but with the implementation of the talents training mode of “two combinations and two integrations”, the proportion of experimental training and practical skills teaching gradually increases and the internship is prolonged. However, the teaching evaluation still uses the traditional evaluation means, and is still based on classroom teaching evaluation. From the teacher’s point of view, teaching evaluation has become a means of teacher assessment. The evaluation result is a label of teacher’s quality, and also an important basis for teacher’s promotion, rewards and punishments. This kind of teaching evaluation loses the role of guidance and developing for teacher’s teaching, and
also not conducive to the learning and improvement of teacher’s practical skills and experience. From the student’s point of view, paying attention to the evaluation results or concluding evaluation, emphasizing written examination and too simple evaluation method are not conducive to stimulating students’ learning initiative.

3.2. Single Evaluation Method
Quantitative evaluation is the only way to evaluate the teaching currently, and scores is the main index to evaluate the quantity and mastering degree of knowledge. Usual scores are determined by classroom performance and homework completion condition, and the result of this semester is evaluated based on the scores of final examination and usual scores. The examination mainly applies closed-book test, focuses on theoretical test but not practical test, and experimental training is included in the usual scores, and rarely specifically applied as a separate assessment way. Examination result is an important indicator for students’ scholarship obtaining or other evaluations, making students blindly pursue high scores and even cheat in the examination to get high scores, which cannot stimulate students’ learning interest and learning enthusiasm. Furthermore, it is more difficult to stimulate students’ creativity, and to assess the overall development of students.

3.3. Single Evaluation Content
In the current evaluation methods, the textbooks determine the test content, and the examination content is the basic knowledge and basic concepts of teaching materials. The main task of teaching is to explain and present the basic knowledge and basic concepts of environmental protection specialty in teaching materials. Assessment is the declarative memorizing and reproduction of the basic knowledge and concepts. There is no assessment on the skill activity of environmental protection specialty, nor assessment on students’ professional ethics and quality, practical quality, entrepreneurial quality and innovation quality. This evaluation content is easy to make students ignore the training and development of their other qualities and abilities, and also cannot cultivate students’ career transfer ability and adaptability.

3.4. Single Evaluation Subject
Evaluation subjects are mainly from school teachers, teachers evaluate students, the self-evaluation of students is lacking, and the evaluation from the enterprises and internship units is also lacking, so that the school’s teaching cannot know students’ level of practical skills in time, which is not conducive for teachers to improve their teaching level. No evaluation from employers results in the embarrassing situation that the students trained by school cannot find appropriate positions in enterprises, because the school does not understand what kind of talent enterprises need and cannot train qualified personnel for the enterprise.

4. Improvement Measures for the Teaching Evaluation of Agricultural Eco-environmental Protection Specialties
Teaching evaluation model lags behind the reform of personnel training model, the gap between teaching evaluation and talent training objectives is growing, and the students trained cannot adapt to the needs of society. In order to better cooperate with the reform of the talents training mode of the “two combinations and two integrations” of deep integration between production and education, it is necessary to reform the teaching evaluation system to achieve the personnel training objective of meeting the first-line requirements from production, construction, service and management, and to improve the quality of talents of agricultural eco-environmental protection specialties.

4.1. Establishing Diversified Evaluation Indexes
Based on the comprehensive evaluation concepts, rich evaluation content and the evaluation of multi-agent participation, the evaluation system and standard must also be multi-angle, multi-level, and multi-grade. In the aspect of evaluation criteria, we should develop a relatively strict learning level to
evaluate the basic knowledge and professional theoretical knowledge of agricultural environmental protection specialty, which should increase in turn in accordance with cognition, understanding, application, analysis, synthesis and evaluation; for the training on the abilities of analysis, monitoring and management of environmental pollution, evaluation level of specific independent operation and innovation should be developed; students’ professionalism, teamwork spirit and communication and coordination skills should be constantly cultivated in the study and internship work, so that evaluation on non-cognitive skills like professional ethics and dynamic and developmental evaluation system should be established, instead of applying an integrated and standardized evaluation system.

In the personnel training mode of “two combinations and two integrations”, teaching quality evaluation is multi-angle comprehensive evaluation. The content of traditional professional teaching evaluation is limited to the students’ evaluation on the basic theoretical knowledge of profession. The main content of the evaluation is students’ mastery of agricultural environmental protection knowledge, while the evaluation on students’ professional ability, practical ability, employability, entrepreneurial ability and related knowledge is less. For example, according to the curriculum module designed by the personnel training mode of “two combinations and two integrations”, six courses including Agricultural Environmental Monitoring, Environmental Engineering Design, environmental Impact Assessment, Water Pollution Control Technology, Environmental Microbiology and Agricultural Ecological Engineering are set as professional core courses, highlighting the technical application ability, professional quality, innovation awareness and entrepreneurial ability training. The evaluation content also expands accordingly, and more attention is paid to the assessment on practical ability and professional ability. In the real work situation of internship, evaluation is conducted on the sense of participation, the spirit of cooperation, ability to explore problems, problem analyzing and solving skill, and the mastering level of knowledge and skills reflected by students in the working activities.

4.2. Establishing Diversified Evaluation Subjects
In the personnel training mode of “two combinations and two integrations”, enterprises have become the main strength of vocational education, and practical education accounting for a large proportion of the total class hours, such as experiment, practical training, design, internship and so on, is completed in enterprises. Evaluation from the enterprises and society not only makes the evaluation of students’ practical ability more realistic, scientific and appropriate, but also can help schools and teachers timely solve teaching problems and affect teaching orientation, so that vocational education can better meet the needs of enterprises and society. Therefore, the teaching evaluation subject must be diversified, in order to guarantee that evaluation activity can provide multi-angle and multi-level evaluation information. Evaluation subject not only includes teachers and students within the school, as well as enterprises and society outside the school. Especially in the mode of “integration of production and education, and integration of working and learning”, the evaluation from enterprise increasingly highlights its significance and value. It is necessary to give full play to the role of the enterprise, and to make enterprise participate in the process of teaching evaluation. Through establishing a sound process evaluation system of enterprise, the practical teaching of students in the enterprise can be completed, while the evaluation on students’ learning quality during the internship is completed as well. The evaluation of final teaching effectiveness is the combination of society and enterprise’s evaluation and school’s independent evaluation[6-7].

4.3. Establishing Diversified Evaluation Feedback Mechanisms
According to the feedback of evaluation results, the completion condition of teachers and students’ teaching activities can be grasped, so as to constantly adjust the goal of personnel training. Through the feedback of evaluation results, teacher’s teaching level and effectiveness can be known, so as to find teachers’ merits and faults, contradictions and problems, and to facilitate schools and teachers to arrange training for improvement. Based on the feedback of the evaluation results, effective distinction of knowledge mastery and ability development among students can be conducted, so as to provide
reference for the guidance of students’ learning. The feedback of the evaluation results can help teachers and students know the achieving condition of teaching and learning, thus facilitating teachers to adjust their teaching methods timely, and students to adjust their learning methods. Research has proved that timely and objective feedback of diversified evaluation can mobilize the enthusiasm of teachers and students, so that students can be improved based on the evaluation of teachers and enterprises, and gradually learn to conduct self-evaluation and self-improvement.

Table 2. Characteristics and manifestations of new teaching evaluation.

| Items                      | Characteristics | Manifestations                                                                 |
|----------------------------|-----------------|--------------------------------------------------------------------------------|
| Evaluation index           | Diversification | Multi-angle, multi-level, and multi-grade.                                    |
| Evaluation subject         | Diversification | Combination of enterprise’s and school’s independent evaluation.              |
| Evaluation feedback        | Diversification | Feedback on teaching effectiveness and its influencing factors from teachers,  |
| mechanism                  |                 | students and enterprises.                                                     |
| Overall result             | Diversification | Can meet the requirements of talent evaluation and teaching reform goals.     |

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