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A Study of Students' Achievement Evaluation Modes Based on Practical Courses concerning Higher Vocational Gardening Technology Major

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Abstract True, objective and impartial course and achievement evaluation is the requirement of modern higher vocational education, and can avoid "high scores and low abilities" of students to the maximum. This article focuses on expounding the "two connections and five combinations" dual evaluation modes of higher vocational gardening technology major students' achievement on practical courses, namely connection between major and industry; connection between achievement and occupation; combination of on-campus and off-campus teachers' evaluation; combination of process and results evaluation; combination of course evaluation and professional skill appraisal; combination of students' self-evaluation and teachers' evaluation; combination of examination paper and non-examination paper evaluation; combination of group and individual evaluation.

Key words Gardening, Practical courses, Achievement evaluation

1 Introduction

Higher vocational education is different from ordinary higher education in its occupational feature. As we all know, students' occupational ability and quality training is based on personnel training programs, course teaching and course achievement evaluation. For the major courses of a sound practical basis, a good achievement evaluation mode can effectively improve course teaching effectiveness, help to develop students' vocational skills and literacy, and enhance the personnel training quality. In view of this, through many years of efforts, in accordance with the requirements of personnel training mode concerning gardening technology major, the research group performs teaching reform on *Flower Production Technology and Vegetable Production Technology* and explores students' achievement evaluation modes based on practical courses concerning higher vocational gardening technology major to form the dual evaluation modes.

2 Connecting major and industry and connecting achievement and occupation

The higher vocational education is employment-oriented, and the achievement evaluation should serve the employment or entrepreneurship. The research group adheres to "connecting major and industry, connecting achievement and occupation" in major course design, teaching, achievement evaluation and real jobs. Through in-depth field research and survey in government departments and enterprises, we study the government and enterprise's policy on

the development of gardening industry, and learn about the gardening business production status and trends. According to research and survey results, the research group predicts the development trends of gardening industry in the coming 3 to 5 years. Based on the actual production of regional gardening industry, the government and gardening business experts are invited to determine the teaching content and credit hours in accordance with the skills, break the discipline system, reconstruct the curriculum system, conduct curriculum design, develop curriculum standards, and implement the project teaching on the basis of horticultural plant production process, in order to achieve "connection between major and industry, connection between students and occupation".

3 Combination of process evaluation and result evaluation

As we all know, the production of horticultural plants is a continuous process from sowing to fruition, which takes a long time; at the same time, it is a dynamic process. Traditional course achievement evaluation is mostly based on the final examination paper, and the course achievement evaluation modes which place too much emphasis on results can not truly reflect the students' vocational skills, and do not help to cultivate students' quality of enduring hardship and teamwork spirit. In view of this, as for the core courses concerning gardening major with strong practicality (such as *Flower Production Technology and Vegetable Production Technology*), the research group divides the teaching program into process program and result program, and takes the corresponding evaluation methods (Table 1). The process program is a dynamic program throughout the whole process of plant growth, and it takes a long time and needs to be repeatedly implemented. In the evaluation of course programs, the research group uses the dynamic

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process evaluation, that is, the implementation process is recorded every time it is implemented. According to a specific growth stage of horticultural plants as well as the production process (such as seedling, flowering and fruiting periods) management record table (Table 2), teachers conduct multiple dynamic evaluation. The result program takes little time, and once it is implemented, we can evaluate students' mastering of some programs such as flower species identification, planting, cutting, grafting and pruning. The

result evaluation is used for these programs by assessing the students' operation process and effect. Taking grafting for example, the result evaluation is shown in Table 3. The dynamic process evaluation and static result evaluation can truly and accurately reflect the students' proficiency levels of skill and technology in the entire plant production process, and provide the original basis for teachers to improve teaching.

Table 1 Program evaluation methods for core gardening major courses

Program category	Program name	Evaluation methods
Process program	Production management programs such as production environment control, fertilizer and water management, pruning and pest control	Process evaluation
Result program	Technical skill programs such as planting, cutting, grafting, species identification and scaffolding	Result evaluation

Table 2 Production process record of horticultural plants

Growth stage	Plant height // cm			Average plant height cm	Growth status	Fertilization	Water management	Pests and control measures	Grading
	Plant 1	Plant 2	Plant 3						
Germination									
Seedling									
Flowering									
Fruition									

Table 3 Grafting program evaluation methods

Grafting process	Time	Evaluation standard
Rootstock treatment	Bud grafting takes no more than three minutes and scion grafting takes no more than five minutes.	The score is given according to students' grafting time and grafting skill requirements.
Scion treatment		
Joining		

4 Combination of course achievement evaluation and national professional skill appraisal

According to the work type that courses correspond to (see Table 4), combined with national vocational skill certification examination in the recent three years, students' course achievement is evaluated. Practice has proved that by combining the course

achievement evaluation and professional skill appraisal, both the percent of pass and distinguished achiever ratio of students who take the national vocational skill certification examination are improved, laying a solid professional foundation for students to obtain the corresponding vocational qualification or start up their own undertaking.

Table 4 Courses and the corresponding work type

Course	Work type	Part of identification programs	Course evaluation programs
Flower Production Technology	Flower gardener	Flower species identification, chrysanthemum grafting, cutting, flower pots, flower pruning, fresh preservation of cut flowers, etc.	Flower species identification, grafting, cutting, flower pots, flower pruning, fresh preservation of cut flowers, etc.
Vegetable Production Technology	Vegetable gardener	Vegetable seed treatment, grafting, etc.	Balsam pear grafting, seed quality testing, soaking of seeds, etc.
Fruit Production Technology	Fruit gardener	Grafting, pruning, fertilizing, etc.	Fruit grafting, pruning, fertilizing, etc.

5 Combination of team evaluation and individual evaluation

The implementation of practical course programs needs to be completed by team, and there is a need to cultivate students' teamwork and collaboration spirit. The research group divides some programs

(such as base material preparation, disinfection, seeding and pest control) into team and individual programs, and classifies 3 to 5 students as a group (Table 5). With group as unit, the unified evaluation is conducted according to the group's performance, to cultivate students' teamwork spirit. By combining team evaluation

and individual evaluation, students' teamwork awareness and co-operation capacity are constantly enhanced, and the sense of re-

sponsibility continues to increase.

Table 5 Team and individual program evaluation

Program category	Program name	Ability cultivation	Evaluation methods
Team program	Base material preparation, disinfection, seeding	Teamwork	Unified evaluation with groups as team
Individual program	Growth process management such as pruning, fertilization, pest control, etc.	Hard-working awareness and sense of responsibility	Evaluation according to the actual individual performance and plant production

6 Combination of paper evaluation and non-paper evaluation

The research group reforms the course examination forms, and pays equal attention to theory and skill assessment. The theory assessment is based on examination paper with "practicalness" as

principle while the skill assessment is based on non-examination paper, using "double hundred points system" (100 points for theory and 100 points for skills). Students can pass the exam after obtaining more than 60 points in theory test and skill assessment at the same time. Evaluation is shown in Table 6.

Table 6 Evaluation of theoretical knowledge and operation of vocational skills

Programs	Evaluation form	Results/achievement	Evaluation results
Theoretical knowledge	Examination paper (written examination)	100 points	Students can pass the exam after obtaining more than 60 points in theory test and skill assessment at the same time; if the score in either theory test or skill assessment is less than 60 points, students must take a make-up exam.
Vocational skills	Non-examination paper (practice)	100 points	

7 Combination of students' self-evaluation and teachers' evaluation

In order to cultivate students' ability to conduct self-evaluation on the level of proficiency in professional skills while avoiding the influence of teachers' subjectivity on students' achievement evaluation, the research group introduces the mechanism of combining students' self-evaluation and teachers' evaluation, that is, when evaluating the same program, students and teachers give scores in accordance with corresponding standards (students' score accounting for 40% and teachers' score accounting for 60%). Practice has proved that by combining the students' self-evaluation and teachers' evaluation, the enthusiasm of students for participating in achievement evaluation is improved, and they are more satisfied with the achievement evaluation results, and more firmly master the professional skills.

search group not only takes students' vocational skill evaluation into production enterprises, but also introduces the frequently asked questions in the actual production and advanced technology into theoretical knowledge course evaluation. The theory examination is jointly made out by enterprises (off-campus teachers) and on-campus teachers. 60% of examination questions are determined by the production line technical experts and off-campus teachers, and 40% of examination questions are assigned by on-campus teachers. After years of exploration, the research group implements dual evaluation modes in order to improve students' enthusiasm for learning in practical courses, make students fully take part in the horticultural plant production process, break away from the traditional cramming method and static achievement evaluation mode of final examination, and objectively evaluate students' achievement in the whole learning process. Practice results show that the mode allows the teaching and learning to be more harmonious and more efficient. Of course, this evaluation mode still has many problems and shortcomings, such as excessively large class size, multifarious horticultural plants, limited training conditions and inadequate training and assessment work, and the research group will address the existing problems and shortcomings and further explore and improve the mode.

8 Combination of on-campus and off-campus teachers' evaluation

To prevent students' course achievement evaluation from being divorced from the actual production, the research group conducts field survey in gardening production enterprises, and works together with enterprise production supervisors and off-campus teachers to determine some skill training programs based on the production skill requirements such as balsam pear grafting and ivy cutting, and carry out site operation assessment in the production enterprises. According to the actual production requirements and full-time employee and industry standards, combined with students' practical operation, the on-campus and off-campus teachers conduct site evaluation, and the off-campus teachers' scores account for 60% while the on-campus teachers' scores account for 40%. The re-

9 Conclusions

True, objective and impartial course and achievement evaluation is the requirement of modern higher vocational education, and can avoid "high scores and low abilities" of students to the maximum. This article focuses on expounding the "two connections and five combinations" dual evaluation modes of higher vocational gardening technology major students' achievement on practical courses,

learning. When the reputation of the school is high, the students' learning enthusiasm will be high, and they will have good learning habits and gain a strong sense of achievement in the learning process^[3].

4.2 Establishing the competitiveness assessment system for colleges and universities based on discipline competitiveness

There is a need to regulate the relevant assessment, and prohibit the release of unauthorized evaluation ranking of various universities^[1]. The colleges and universities should take the undergraduate teaching as the most basic work, improve the quality of undergraduate teaching, and strengthen discipline construction, to improve discipline reputation. The agricultural colleges and universities should cultivate the inter-disciplinary talents who are well versed in various agricultural skills.

4.3 Scientifically choosing the suitable discipline when students choose colleges and universities and discipline

Only by selecting the suitable discipline will the students never regret their choice after being admitted to the university and achieve satisfactory results in every aspect of the future college life.

4.4 Consolidating the basic position of undergraduate teaching Undergraduate teaching should be based on "students' all-around development". It is necessary to take undergraduate teaching as the school's most basic work, and make leadership energy, teacher resources, resource allocation, funding arrangement and job evaluation oriented by the teaching.

4.5 Improving the teaching level and teaching ability of young teachers Relying on "Teaching Development Center", it is necessary to vigorously strengthen the training of young teachers' teaching ability, and purposefully carry out career planning guidance, teacher training, teaching counseling and teaching evaluation.

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namely connection between major and industry; connection between achievement and occupation; combination of on-campus and off-campus teachers' evaluation; combination of process and results evaluation; combination of course evaluation and professional skill appraisal; combination of students' self-evaluation and teachers' evaluation; combination of examination paper and non-examination paper evaluation; combination of group and individual evaluation. An appropriate students' course achievement evaluation mode can help to establish modern higher vocational college management system, improve the higher vocational education quality, enhance vocational students' employment competitiveness, and promote the sustainable development of gardening industry.

4.6 Creating a good academic research atmosphere based on agriculture

It is necessary to strengthen discipline construction and disciplinary orientation, integrate the disciplines with features and advantages, and build the discipline bases and academic team, so that the school's academic research has a solid foundation. At the same time, the establishment of disciplines with features and advantages will inevitably lead to the continuous gathering of discipline resources and produce spillover effect, which is not only conducive to attracting more talents, but also conducive to the application of a variety of research projects and especially major national research projects. Academic research is a symbol of the university, also the key to core competitiveness of the university, and it is based on the discipline construction^[6].

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