

Task-driven teaching method in the secondary fruit and vegetable storage and processing course Practical Study

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Abstract: The reform and reorganization of the teaching content design of the course "Fruit and Vegetable Storage and Processing" in secondary schools is carried out in a task-driven manner. The course content design is characterized by: task-driven, reflecting the concept of "integration of science and practice"; establishing course objectives with employment problems; selecting course content with vocational ability requirements, professional knowledge characteristics and enterprise experts' opinions; reflecting the "regional, vocational and professional skills relevance" of teaching content. The course content can reflect the "regional, vocational and professional skills relevance" of the teaching content. In the organization of teaching contents, the concept of "progressive task-driven teaching" is also reflected, and the "continuity and gradient" of work task setting is considered. The optimized design of task-driven teaching content is an important inspiration for the construction of secondary vocational agricultural products courses.

1. Introduction

In the traditional vocational education teaching, the classroom teaching design of the course is teacher-led, the teacher teaches, the students listen, this traditional mode, easy to lead to student fatigue in the listening process, but also easy to develop the dependence of students in the course of learning, is not conducive to the cultivation of students' independent learning ability^[1]. With the rapid development of China's economy, the pressure of social survival has increased, and students trained in this traditional teaching mode are difficult to adapt to the actual needs of social competition, which greatly restricts the development space of students. The deepening reform of the traditional course teaching mode and the integration of task-driven teaching mode in classroom teaching can change the learning state of students' passive learning and passive acceptance, and change passive acceptance into active learning. From the point of view of students' own learning status, the quality of students in vocational education schools is generally low, students do not have good learning habits and learning attitudes, and their learning performance is relatively poor^[2]. By introducing task-driven teaching in teaching, it can effectively promote students' learning autonomy.

Based on his own study and research on task-driven teaching method, Prof. He Keqiang puts forward its basic characteristics that the task-driven teaching method mainly takes the completion of tasks as the fundamental purpose and the accumulation of knowledge and the development of skills as the ultimate purpose, and proposes that the teaching structure should overturn the tradition and emphasizes that a teacher-led and student-led teaching structure should be used. According to Li Hongyan, when applying the task-driven teaching method, the process of students completing learning tasks is essentially solving one problem after another, and each student has different solutions to complete the task, so there are various solutions to the problem.

Collating the research theories of experts and scholars, the concept of task-driven teaching method adopted in this paper refers to the integration of the curriculum to drive teaching with a variety of thematic tasks, which can be discipline-specific tasks, learning can also be authentic problem scenarios, students learn organically in the dynamic process of asking questions, thinking about problems and solving them, and while completing the tasks, they also complete the required

mastery of learning of knowledge.

This study combines relevant theories to argue that task-driven teaching should firstly integrate tasks in every aspect of teaching, driven by tasks. Students use the Internet to find resources freely, learn independently and collaborate in groups to complete the assigned tasks; Teachers answer difficult knowledge points in class and arrange course practice to help students successfully achieve practical results; Through the continuous completion and practice of tasks, the learned knowledge points are consolidated and stimulate students' interest in learning and develop their learning ability. Combined with the teaching content of the course, the teacher can divide the knowledge into two modules: fruit and vegetable storage and fruit and vegetable processing, each module is subdivided into several tasks: for example, fruit and vegetable storage can be composed of several tasks such as post-harvest treatment, disease treatment, post-harvest commercialization treatment, transport and storage of fruits and vegetables^[3]. The processing part, on the other hand, has tasks such as selection and pre-treatment of raw materials for fruit and vegetable processing, processing of common fruit and vegetable processing products (canned, frozen, sugar, pickled, dried, fruit and vegetable juice, fruit wine). In each task is subdivided into individual teaching activities, and then using task-driven teaching method to implement teaching activities, this from the overall module subdivided into specific tasks, and through the breakdown of specific tasks, and then drive the completion of the teaching activities method, known as task-driven teaching method.

2. Purpose and significance of the study

To explore the basic model of applying task-driven teaching method to the course "Fruit and Vegetable Storage and Processing", and to construct the basic structure of teaching resources of the course which is compatible with this model.

To improve the teaching resources of the course and build the teaching program of the course based on task-driven teaching resources (including teaching methods, teaching activities, teaching organization forms and teaching curriculum).

Based on the integration of science and practice, teachers and students communicate and participate, reform the teaching content, incorporate the new knowledge, technology and techniques involved in the course into the teaching content, complete the teaching design of the course as a whole and each chapter, and complete the evaluation scheme of the course as a whole and the evaluation scheme of each chapter (including formative evaluation and summative evaluation).

Summarize and enhance the practical research results of the course, and form a general teaching program based on task-driven method for agriculture-related majors in secondary institutions, with a view to providing a model and reference for similar courses.

3. Research design

The design of the teaching content of this course is mainly considered from the following aspects:

(1) Clarify the role of the course and the positioning of the course by reviewing the data and literature as well as industry research and analysis;

(2) Determine reasonable teaching objectives of the course by analyzing the teaching standards of the profession to which the course belongs and combining them with the training objectives of students' employability;

(3) Clarify the needs of the industry through extensive research, combine with the characteristics of the profession, and select suitable course teaching contents;

(4) Reasonably organize the selected teaching contents in a task-driven way;

(5) Design reasonable teaching priorities and difficulties by combining the characteristics of students and course contents, and complete the design of teaching contents.

4. Selection of teaching tasks, specific implementation process and organization of teaching activities

4.1. Categorization and selection of tasks

The selection of tasks for the course is based on the existing practical experience of vocational colleges, and the tasks need to be designed according to different types of learning tasks, which can be divided into four hierarchical types according to the ease to difficulty of learning tasks in vocational colleges: career-oriented tasks, procedural tasks, special tasks with problems and tasks with unpredictable results.^[4] The learning tasks of the fruit and vegetable storage and processing course are formulated as problem-embedded special tasks, which are open-ended tasks that combine experience and skills of the company. In order to make the selected teaching content more scientific, the course considers the following four ways to update the teaching content in time:

- (1) Researching local primary agricultural products and processed foods by meticulous study of the Chinese food industry network;
- (2) Listening to the advice of local enterprise experts;
- (3) Conducting comprehensive study from educational peers' textbooks and websites;
- (4) Combining the learning projects of processing courses in this major (e.g. Green Food Processing Technology, Beverage Food Processing, Dairy Processing, and other courses)^[5].

The final content of the fruit and vegetable storage and processing course was determined to have the following two main tasks.

Table 1.Task-driven instructional content design

Mission Board	Teaching tasks	Decomposed sub-tasks	Teaching activities	Capacity requirements
Task 1	Basic theory of storage and processing of fruits and vegetables	Understanding Storage and processing of fruits and vegetables	Literature review, information gathering, analysis and summary	Understanding the importance and necessity of storage and processing of fruits and vegetables. Create awareness of value-added post-harvest preservation and quality and safety
		Quality composition and storage physiology of fruits and vegetables	The main qualities of fruits and vegetables identification	Accurate determination of the main fruit and vegetable quality
			Measurement of respiratory strength	Understand respiratory intensity and respiratory leap.
			Observation of condensation in storage	Understanding the factors affecting respiration and evapotranspiration
			Identification of major diseases in storage	Understand the regulation of respiration and evapotranspiration Identify and prevent the main diseases of stored fruits and vegetables
Task 2	Fruit and	Post-harvest	Completion of	1.Master the processing

	vegetable storage technology	commercialization of fruits and vegetables Processing	commercialization processes such as pre-cooling, cleaning, grading, coating and packaging	techniques of commercialization of fruits and vegetables 2.To understand the main stages of cold chain distribution and management knowledge of the application of micro cold storage, new material films, biotechnology in storage. 3.Understand the application of cold storage and gas storage in local fruit and vegetable storage. 4.To explore the deficiencies in local fruit and vegetable storage and the measures to address them.
		Cold chain distribution of fruits and vegetables	Practical research on local fruit and vegetable cold transport chain	
		Fruit and vegetable storage methods	Visit to investigate the main storage methods for local fruits and vegetables	
		Examples of fruit and vegetable storage	Investigation of practical examples of storage of potatoes, grapes, etc.	

4.2. Specific implementation of teaching activities

Each task includes the task name, task introduction, learning objectives, implementation equipment and environment requirements, problem study, implementation steps, learning evaluation, and notes. The learning starts with the formation of learning groups and the implementation of teaching activities as required. In the process of task-driven teaching, it should be possible to simulate enterprise work situations or carry out school-enterprise cooperation to the maximum extent, make good design of problem introduction teaching, make good use of case method, discussion method and other teaching forms, actively and effectively play the function of project teaching work and teaching integration, so that students can creatively complete tasks in real or near-real work situations and continuously enhance their comprehensive vocational ability and quality.^[6] Teachers should lay out work tasks in advance and clarify the specific division of labor between teachers and students to ensure the subjectivity of students and the dominance of teachers. Students should complete the tasks through communication and cooperation on the basis of independent thinking, and teachers should make the necessary knowledge explanation and migration, and work with students to summarize and improve the course. The following is a brief example of its application in the teaching of Fruit and Vegetable Storage and Processing. Students, under the guidance of the instructor, first divide into groups and select one or several sub-tasks from the optional tasks given by the instructor to be completed collaboratively^[7]. The course lecture time is used as the start and end time of the task, and the task is completed to form a research result for acceptance and evaluation of the task. The teacher can identify one of the designed tasks as a demonstration for the lecture. Task two is used here as an example.

Task 2: Storage and preservation treatment of a local fruit or vegetable. Using the fruits and vegetables in Task 1 as the object of study, students are first grouped into teams of 8 to 10 students, and each team chooses one or two fruits and vegetables and spends a specified amount of time to complete the storage and preservation treatment of the selected fruits and vegetables. Students need to have knowledge of fruit and vegetable picking techniques, post harvest physiology, post-harvest commercialization treatments and specific storage conditions and techniques to successfully carry out this task. Finally, each group develops a complete post-harvest commercialization treatment and

storage and preservation technology plan for the selected fruit or vegetable. Teachers and students summarize and conclude the plan together, continuously improve it through communication and discussion, and use the improved plan in practice to test the preservation effect.

4.3. Course evaluation

The traditional course teaching evaluation of student subjects is not prominent, the ability goal is not clear, and the vocational activity orientation is missing. The new evaluation system should establish a quality control system with process control as the basic feature and a diversified evaluation mechanism, change the traditional single assessment mode, and implement the 'process + results' assessment mode. The evaluation methods should be diversified, including students' self-assessment, mutual evaluation, group self-assessment, inter-group evaluation and teacher evaluation, etc. This is not only conducive to students' self-cognition, but also can achieve the sharing of results, mutual learning, mutual progress and improvement^[8]. The evaluation should include knowledge, competence and quality, among which competence is divided into professional competence, methodological competence (digital application, information processing, problem solving, self-learning, innovation and creativity, etc.) and social competence (communication and cooperation with others) and their specific requirements in combination with each other as a whole. For example, the ability to design tasks related to fruit and vegetable storage and processing, the standardization of instrument operation, proficiency and error correction in the process of task completion, cooperation and coordination in the process of teaching activities, summary, analysis and evaluation of tasks after their submission, standardization of results reporting, presentation and expression of results, etc.

5. Conclusion

In this paper, we have reformed and reorganized the teaching content of 'Fruit and Vegetable Storage and Processing' course in secondary schools with a task-driven teaching method. The reform and reorganization of teaching contents are carried out. The course content design reflects the concept of 'integration of science and practice'; It can establish the course objectives with the social needs; It can closely match the actual production situation in China, especially the local enterprises, and try to reflect the frontier development of the fruit and vegetable storage and preservation field at home and abroad; it can combine the vocational ability demand, professional knowledge characteristics and enterprise experts' opinions to select the course content; It can reflect the vocational ability demand, professional knowledge characteristics and enterprise experts' opinions. The content of the course can be selected by combining the needs of vocational ability, professional knowledge and the opinions of enterprise experts; It can reflect the characteristics of 'strong scientific, regional practicality and relevance' of the teaching content. In the organization of teaching contents, it also reflects the concept of 'progressive task-driven teaching' and takes into account the 'continuity and gradient' of work task setting. The optimized design of task-driven teaching content is an important inspiration for the construction of secondary vocational agricultural products courses.

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