

## Research on SPOC Teaching of Food Machinery and Equipment Based on Superstar Learning Link

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**Abstract:** Food machinery and equipment is an important core course for food majors, but in the traditional teaching process, the teaching effect is not ideal due to its difficult content, complex structure, and tediousness. SPOC teaching is a new teaching mode appearing in the "Internet +" era. This article analyzes the necessity of applying the SPOC teaching based on Superstar Learning Link in the food machinery and equipment course, and focuses on the preparation stage under this teaching mode, as well as the implementation of specific classroom teaching. The model pays attention to the organic combination of online and offline learning, cultivates students' autonomy and consciousness in learning, realizes close integration between class and lesson, and achieves ideal teaching results.

### 1. Introduction

In the information age and even the intelligent age, knowledge has undergone great changes, from static to dynamic, from abstract to concrete, from "hard" to "soft", from whole to fragmentation [1]. Since knowledge has changed, learning naturally also needs to change, and teaching must also change. Modern college students have grown up with the Internet, and the amount of knowledge they acquire is diverse and diverse. It is no longer limited to physical classroom teaching. Massive knowledge online, traditional classroom teaching has lost their appeal to them [2]. Because of this, the Ministry of Education proposes to build a new information-based teaching environment, optimize the education model, and promote education reform based on the deep integration of information technology and education.

With the development of the information technology era, information literacy has become one of the necessary abilities for students to enter the society. Digital terminals represented by smart phones not only provide students with new social and entertainment modes, but also open new ones. Learning mode, more students start downloading videos, online learning, online testing, and online interaction with teachers through some cloud classroom platforms. SPOC (Small Private Online Course), a small-scale restricted online course, overcomes Traditional short courses have many disadvantages, such as difficulty in management, delayed teaching feedback, etc. This article starts from the practical teaching of food machinery and equipment for many years, and explores the SPOC teaching mode based on Superstar Learning Link, integrating online and offline teaching and learning, and more Good training of students' higher-order thinking skills.

### 2. Necessity of adopting SPOC Teaching Mode in Food Machinery and Equipment Courses

#### 2.1. SPOC Teaching Mode

SPOC is a small-scale restrictive online course. It was first proposed and used by Professor Armand Fox of the University of California. SPOC combines the advantages of MOOC and also makes up for the shortcomings of traditional classroom teaching. Perfect integration with classroom teaching [3]. According to the currently published literature, SPOC can be defined as a combination of offline and online blended learning solutions and teaching models, or it can be defined as a completely online learning course for specific populations [4]. No matter which definition is adopted, corresponding teaching resources need to be created on the platform.

## **2.2. Superstar Learning Pass**

Superstar Learning Link is an interactive mobile teaching platform based on mobile internet launched by Superstar [5]. The platform is powerful and integrates resources, courses, learning, evaluation, and interaction into one, with basic functions such as notification, check-in, grouping, discussion, uploading and downloading, homework, voting, scoring, and statistics. Teachers use the learning communication platform. It can integrate resources such as courseware, videos, teaching materials, and question banks for curriculum construction and organize teaching activities. Students complete learning tasks through the Learning Link App, which is very suitable for SPOC curriculum teaching requirements.

## **2.3. The Necessity of SPOC Teaching in the Teaching of Food Machinery and Equipment Course**

Food machinery and equipment is a professional and highly applicable professional course. Its content is abstract and boring. It requires students to have good engineering literacy and practical ability. This is for students who are focused on process learning and lack of perceptual knowledge of mechanical equipment. It is quite difficult to say. In the traditional teaching organization model, only focusing on knowledge transfer, ignoring the exercise of students' subjective initiative and the cultivation of practical ability. Through the learning of the curriculum, students only memorize the factual knowledge, no. It is difficult to develop the higher-order thinking of analysis, evaluation and creation by constructing the knowledge learned.

In the SPOC teaching mode, teachers regularly release video teaching materials, arrange assignments and organize online discussions on a weekly basis according to the syllabus. Students are guided by the learning list to complete video viewing, assignments and participate in discussions at the time. In the classroom, the teacher conducts classes. Classes are taught in class, answering questions on online courses, and conducting classroom tests. During the classroom learning process, students communicate and discuss with teachers about difficult and difficult issues, so as to cultivate students' good learning attitude and learning habits. This teaching mode will be used in online classrooms. It is deeply integrated with the physical classroom, prioritizes the learning of factual knowledge, and maximizes the use of face-to-face teacher-student communication time, so as to liberate classroom time and space and further promote the cultivation of higher-order thinking.

## **2.4. Front-end Analysis of SPOC Teaching Mode**

The front-end analysis mainly analyzes the curriculum objectives, teaching objects, teaching content, and teaching environment. The analysis of curriculum objectives is mainly based on the graduation requirements, analyzing the knowledge, abilities, and qualities that students can achieve after the implementation of this course, and the graduation requirements on the curriculum requirements. It is realized through corresponding teaching content and teaching methods. The teaching object mainly analyzes the general characteristics, learning abilities, and interest characteristics of the learners; the analysis of the teaching content should focus on the overall curriculum goals, determine the scope and depth of the learning content, and reveal the learning content. The connection between the parts; the learning environment includes the SPOC platform and the classroom teaching environment.

## **2.5. Course Goal Analysis**

Food machinery and equipment is a core course for food science and engineering majors. It mainly introduces the structure, characteristics and working principles of related machinery and equipment used in food factories, and solves the problems related to the operation of machinery and equipment in food factory production after graduation. It has laid a good foundation for equipment selection. Traditional teaching is to allow students to learn and memorize the structure, characteristics and working principles of different mechanical equipment, and use it for equipment selection in food factory design, or to solve problems in actual work. Equipment-related product processing technology, food quality issues.

## **2.6. Analysis of Teaching Objects**

Before the course begins, pre-tests are conducted through questionnaires to understand students' knowledge, learning styles, and attitudes. "Food factory machinery and equipment" is targeted at third-graders and students of food science and engineering. The scale is about 150 people. Students have previously taken professional courses in mechanical basics, food engineering principles, food technology, etc., and mastered the principles and calculations of unit operations such as drying and distillation. However, they have no factory internship experience and equipment design capabilities. There are also some difficulties in identifying the equipment structure diagram. Some students from this major come from key high schools and some from general high schools, and their learning abilities are uneven, and it is difficult to meet the individual learning requirements using the traditional teaching method.

## **2.7. Analysis of Teaching Content**

With the advent of the intelligent era, automation control technology, digitalization, and intelligent technology have been widely used in food machinery. The rapid development of the food processing equipment manufacturing industry determines that the teaching of food machinery and equipment courses must keep pace with the times, but The textbook itself is lagging and cannot reflect the latest developments in food machinery and equipment. Therefore, in addition to studying the theoretical knowledge and typical mechanical equipment in the textbook, you must also understand the application of new technologies and new equipment manufacturing in current food machinery. For example, the characteristics of equipment in unmanned factories and smart logistics equipment allow students to see some of the "high, sophisticated, and sophisticated" equipment in food processing machinery, thereby arousing students' interest in learning the course.

Since the knowledge in the intelligent age has changed from "hard" to "soft", the teaching method should also change. It should be changed from "knowledge transfer—skill training—thinking training" to "thinking training—skill training—knowledge transfer". The specific knowledge is What you learn "by the way" during thinking training and skill development [6]. Therefore, the teaching process is not the process of developing lower-order thinking to higher-order thinking, but should start with the creation, evaluation, and analysis of higher-order cognitive processes, and then transition to the lower-order thinking of using, understanding, and memorizing. Therefore, in addition to the traditional basic teaching route of "Principle → Transmission → Structure → Function", more learning methods such as pre-class learning, completing tasks, and classroom activities are adopted to master the structure, characteristics, and characteristics of various food machinery and equipment. application.

## **2.8. Analysis of Teaching Environment**

The teaching environment is a multimedia classroom. Teachers demonstrate the teaching content to students through projection and screen transmission systems. Students learn through mobile phones and computers and participate in classroom activities.

## **3. Construction and Implementation of 3 SPOC Teaching Model**

After completing the front-end analysis of teaching, relying on the Superstar Learning Link platform, a SPOC teaching model based on the Superstar platform was constructed, which can be

divided into three parts: creating teaching resources, formulating and implementing teaching strategies, and teaching evaluation.

### **3.1. Create Teaching Resources**

Course resources include instructional resources such as course introductions, course outlines, and learning and test resources such as study sheets, micro-videos, courseware, reference materials, test questions, discussions, tasks, etc. Video resources are divided into courseware production and video recording, etc. The "knowledge fragmentation" principle divides the video teaching content. Generally, a single video is about 10 minutes in length and can be launched after post-processing. Micro-video is particularly suitable for difficult to explain or mechanical structures and operating principles that require intuitive understanding. But the video is only used for The typical technology for knowledge transfer is not the only technology, and it is not necessarily the best technology.

In teaching resources, you must set the selection tasks of different food production lines, such as vegetable juice, milk powder, etc. By completing the tasks, students rebuild their knowledge instead of just memorizing the structure and characteristics of machinery.

After publishing the course resources to the SPOC platform, it forms a complete set of SPOC network learning resources through online organization and integration. Course resources are an important part of SPOC teaching and a key factor to ensure students' autonomous learning efficiently. Therefore, course resources The content should be reasonably designed, targeted, and rich in form and attractive.

### **3.2. Study Before Class**

On the Superstar Learning Link platform, upload the created course learning materials from the computer, and push the teaching resources through webpage links and resource libraries. Students can watch videos or other resources according to the learning task list they receive, and complete the corresponding tasks in groups or Tests. Teachers use the data statistics and analysis functions of the Superstar teaching platform to monitor and analyze the progress of students' online learning, and make appropriate adjustments to the teaching process based on feedback information.

### **3.3. Classroom Teaching**

Through self-study, students have learned about the relevant knowledge in the course. Thanks to the test function of Superstar Learning Pass, teachers can clearly understand the learning difficulties and master the effect of students' pre-class learning, so as to target the difficulties in the classroom. Point to explain, while designing related questions or assessment tasks for students to discuss or complete tasks in the classroom, to help students further internalize their knowledge.

Class activities can include pre-class task reviews, answering questions, discussions, exercises, etc. In order to cultivate students' ability to select and support food processing equipment, set up a food processing production line equipment selection task in class teaching, which is grouped by students Completion of equipment selection calculations. Then through group teaching, classroom discussions and other teaching links to evaluate the task completion of the group, the task completion and participation in the speech will give a certain grade. In the course of class answering questions, teachers It shoulders tasks such as difficult explanations, Q & A interactions, etc. Through communication and interaction, students' knowledge construction and knowledge sharing are realized, and at the same time, self-expression and self-expression are achieved, and the comprehensive ability of students will be greatly improved.

### **3.4. After Class Consolidation**

After class, the students will organize and improve the tasks and other content displayed in the class, and post it to the superstar SPOC teaching platform for everyone to review. Difficult problems encountered by students during the learning process can also be feedback through the platform, and teachers will Answer the questions centrally. After that, you can enter the next round of learning based on the new task list.

In order to further consolidate what students have learned, each chapter requires students to draw a mind map after the study and upload it as an assignment to the Superstar platform. Students can download and study the completed results of various groups or individuals and give points.

### **3.5. Curriculum Evaluation System**

The curriculum adopts a combination of formative assessment and summative assessment. The proportion of summative assessment is 50%. The proportion of traditional teaching process assessment is usually 30%, and the use of SPOC teaching mode needs to focus on process assessment, so it is The proportion of total scores has been increased to 50%. The formative evaluation data comes from the platform's learning records and evaluations of all students, including pre-class task completion, classroom performance, after-class assignments, and student mutual evaluation results.

In order to test the learning results before class, you can set up test questions, tasks, etc., or ask students to post to participate in the discussion. It should be noted that whether students watch the video does not have to be recorded in the grade, because there are many ways and resources for learning, the video is only One. Whether to watch the video is not necessary to achieve the learning goal.

In classroom activities, teachers set tasks to match the corresponding experience values, and students can get experience values after completing tasks. In the completion of post-class tasks, teachers can set teacher evaluation, student self-evaluation, student-student mutual evaluation, group mutual evaluation and other diversity. The evaluation method summarizes and evaluates the learner's performance in the learning process in a timely manner, and stimulates students' enthusiasm for learning to achieve the purpose of personalized teaching.

## **4. Conclusion**

The SPOC teaching mode of food machinery and equipment courses based on the Superstar Learning Link platform transforms the traditional teaching mainly by teachers into teachers-assisted and student-autonomous learning-oriented teaching with smart mobile terminals such as smart phones or tablets as auxiliary tools This mode provides more convenient mobile teaching services for teachers and students, making teachers become designers, promoters, and evaluators of learning, which is conducive to training students' learning autonomy, motivation, and self-learning ability.

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