

Research and Practice of “Integration of Management and Technology” Food Specialty Compound Talents Training Mode

Yichen Peng^{1,*}, Fei Pei², Ji Xia² and Anxiang Su²

¹ School of Business Administration, Nanjing University of Finance and Economics, Nanjing 210023, China

² College of Food Science and Engineering, Nanjing University of Finance and Economics, Nanjing 210023, China

*Corresponding author. Email: pyc114@hotmail.com

ABSTRACT

Contemporary college students are widely accustomed to receiving a passive "indoctrination-styled" education. Meanwhile, teaching methods have not been able to completely break free from the constraints of traditional "technology and theory" training models of Food specialty. In response to this situation, the development of an "integrated management and technology" joint-talent training model has been seen as having a significant effect on stimulating college students' independent learning, innovative abilities, and encouraging their future development. The prior teaching reforms showed that it may have several important effects on students. They included increasing interest in learning, cultivating innovative thinking, and enabling students to develop a high level of professional knowledge. At the same, the model appeared to encourage students to develop better organizational and teamwork skills. This joint set of effects in turn made the Food major students better adapted to the related talent market demands.

Keywords: *integration of management and technology, compound talents, teaching reform, innovation*

1. INTRODUCTION

In recent years, China's food industry has developed rapidly and has become an important industry for national economic and social development [1]. At present, there are more than 200 colleges and universities offering Food majors. Food is a practical discipline with a close relationship between theory and practice. The goal of the discipline is to cultivate “food professionals” who have broad sets of food-related knowledge in chemistry, biology, and engineering, while also having technical abilities in management, quality control, product development, scientific research, and other management areas [2].

With the continued rapid development of information technology, people are paying increasing attention to the development of food industries and how these industries affect their lives. In particular, people are paying increasing concern about nutrition and food safety, so colleges and universities need to value the cultivation of food professionals who have deep knowledge and experience in these areas. However, traditional teaching models which "emphasize theory while ignoring practice," and “emphasize knowledge while ignoring abilities” have in effect weakened the comprehensive abilities of Food students. This has led to the graduates often being disfavored by food companies and increased the difficulty of matching trained food professionals to the needs of the market. In response, a new type of training model is seen as essential in order to improve the comprehensive

abilities of students and have their talents better match the market needs of the food industry [3].

With strong trends of diversification, optimization and multi-function, China's booming food industry requires improving students' practical capacities towards innovation. This is the basis of cultivating qualified talents and a precondition for upgrading the modern food industry. These innovation-focused abilities are inseparable from training in innovative and management thinking. Subsequently, it is not enough for Food students to simply develop theoretical knowledge and technology, but rather, an “integrated management and technology” joint-talent training model is needed.

2. THE NECESSITY AND SIGNIFICANCE OF THE TRAINING OF "INTEGRATION OF MANAGEMENT AND TECHNOLOGY" FOOD PROFESSIONAL COMPOUND TALENTS

The training model of "integration of management and technology" is a new type of training mode that puts forward higher requirements on the technology. The cultivation of this mode can better stimulate the students' interest and desire for active exploration in the food field. At the same time, it can also exercise their ability to solve practical management problems. In addition, it offers students the chance to participate in the management of the enterprise and to comprehend the management thinking

and innovative consciousness of the enterprise in the food field. All above, this training mode provides students with solid foundation for going to society and participating in employment in the future.

In previous studies, we conducted a questionnaire survey on 60 different food companies, and found that most companies value the comprehensive quality and the diversified capabilities of candidates[4]. Most food companies not only care about the professional skills of the applicants, but also value their knowledge of the company's management methods and their understanding of the company's operating mode. Therefore, the training mode of " integration of management and technology " is the market's demand for talents.

3. THE CURRENT PROBLEMS IN FOOD TEACHING

At present, many top universities in the world regard students' ability of lifelong learning as one of their training goals. As it is said, "It's better to teach fishing than to offer fish." Nowadays, in China, the vast majority of colleges and universities in Food Science lack the training to students' ability of lifelong learning. They lack the attention to individual students and the cultivation of students' ability to solve problems when teaching professional knowledge.

3.1. Unclear Training Objectives

After four years of training and learning, students majoring in Food specialty often do not know their employment orientation after graduation, which eventually leads to the passive phenomenon of choosing a career. This not only increases the burden of secondary training for enterprises, but also increases the psychological pressure of employment for students. In most universities, the first two years of Food major are the teaching of basic courses, which makes students have late contact with professional knowledge. Many students don't have a clear learning goal in the first two years of undergraduate study. The effect of this phenomenon will reduce students' interest in the major. So, it is difficult for students to meet the requirements of professional training through four years of university study. And it is not conducive to their future employment or further study in the food industry as well[5].

3.2. Common Homogeneous Problem

As the starting point and the destination of higher education, the most active factor in higher education is to explore the students' own personality and potential. However, most colleges and universities have the phenomenon of emphasizing knowledge and theory from books to different extent. Without paying much attention to the differences between individual students, it is hard

for teachers to teach students according to their aptitude and to explore their potential innovation ability. It is not only a waste of professional talents, but also a waste of national educational resources. Homogeneous problem increases the employment pressure of graduates, and even has an impact on the economic development of society[6].

3.3. Formalization of Innovation and Entrepreneurship Education in Food Specialty

Most engineering students have the experience of training and practice in enterprises, but these training and practice just focus on the training and practice form. In addition, the original motivation of students to participate in these practices is mostly the requirement of graduation, so their performance on entrepreneurial innovation practice activity for participation is not well, and the completion of tasks is poor, or even not completed. Students can get learn a few in these activities. In this process, although most colleges and universities attach great importance to practice courses, the practical ability of students is not significantly improved. At present, there is still a problem of formalization in the internship experience of engineering majors. If the mode of joint training of schools and industrial enterprises is not strengthened, it will be difficult to effectively improve students' employability [7].

3.4. Lack of Knowledge Integration

Firstly, the courses of food majors usually take few humanities and social sciences as general elective courses for students to choose. Due to the non-mandatory learning, many students pay little attention to this kind of courses. In the course of food specialty, it is even more difficult to learn the integration knowledge with other specialties, and students' knowledge construction is simple.

Secondly, higher education is different from basic education. In order to cultivate professional talents, not only most students take professional courses as the main learning content except few elective courses in four years, most teachers in colleges and universities also are divided by their majors. The teachers in the same school often have similar educational backgrounds. Food major is no exception. Teachers majoring in Food have relatively profound academic literacy in the food field, but usually, they are not proficient enough in other knowledge reserves. In particular, there is a big gap between natural science and humanities and social science. If teachers do not have the professional foundation of management, it will be difficult to combine food professional knowledge with management practice in the course and teaching process. Even if students learn the corresponding social science courses in elective courses, no one can properly guide them to combine their own professional knowledge with other knowledge.

4. THE REFORM AND EXPLORATION OF “INTEGRATION OF MANAGEMENT AND TECHNOLOGY” IN FOOD SPECIALTY OF COLLEGES AND UNIVERSITIES

In view of the current teaching situation and existing problems of the Food specialty, advanced cases of innovative education worldwide combined with practical experience of Nanjing University of Finance and Economics are learned and used. The aim of "integration of management and technology" was to explore a compound training mode for the Food specialty of colleges and universities, which can emphasize the future development of each student.

4.1. Clear Objectives in First Year

During the first year of college, students should be actively guided to think about future career planning. Only when the goal is clear can we have a definite aim, and find out the weakness of the ability and cultivate it as soon as possible. Introductory courses should be offered for freshmen majoring in food, while the career prospects and situation of the major should be introduced to the students in the course. Teachers should explain the relationship between the basic courses and professional courses in the first two years, so that students can set a relatively clear learning goal before formal learning of professional knowledge. It will improve the enthusiasm and efficiency of learning in the next four years. In addition, it will help students timely understand the knowledge they need for employment, and select elective courses and extracurricular practical activities in a targeted way, which is conducive to the cultivation of interdisciplinary talents. Especially for the students who want to work in the enterprise, they should make it clear that in addition to their professional ability, they should also have the ability of enterprise management practice, and encourage students to select the internship units in the summer social practice, so as to cultivate the corresponding ability as early as possible.

4.2. Integration of Management Science and Food Technology Courses

Some elements of management science, including manufacturing and service process, supply chain process, supply demand planning and control, can be combined with food technology courses (Food Nutrition, Functional Food and Food Safety). This can help students understand the operation and standard of enterprises in actual processing and production more specifically, and make students have a deeper understanding of the operation of food enterprises. In the process of teaching, the activities of visiting food factories and enterprises should be more, which is conducive to students' understanding of relevant knowledge in management science.

4.3. Setting of Three Practical Training Platforms

Three practical training platforms, including "enterprise workstation platform training", "innovation and entrepreneurship competition training", and "enterprise production and operation sandbox training" are set up in "integration of management and technology". The opening of three different platforms enables students to participate in the practice process and experience the problems that may be encountered in the actual production of enterprises. In the actual training process, students' ability to solve problems is exercised, which can be more in line with the needs of enterprises. Through the training of three training platforms, students will be handier in future employment or further education.

4.4. Improving the Integration of Interdisciplinary Knowledge

According to the employment needs of students, interdisciplinary courses should be included in the teaching plan. Learning and assessment should be like other professional courses, and relevant elements should be added to some courses suitable for integration, to provide students with opportunities to learn the knowledge they need for employment and enrich the knowledge of professional courses.

The colleges should also improve the training of professional teachers' interdisciplinary skills and strengthen the construction of relevant teaching staff. Setting up a teaching and research team of curriculum projects, and making "management - technology" teachers complement each other according to the characteristics of each curriculum will be necessary. The colleges can also improve the teachers' knowledge structure by organizing new teachers training so that they have more opportunities to study professional courses. And the colleges should encourage teachers to participate in university-enterprise cooperation focusing on enterprise management practices, to learn related management knowledge.

5. THE THEORETICAL FRAMEWORK OF INTERDISCIPLINARY “INTEGRATION OF MANAGEMENT AND TECHNOLOGY” TEACHING

The main courses such as "Food Nutrition" and "Functional Food" are taken as examples to organize knowledge in a structured and layered manner. On the basis of the original curriculum design, we explore a theoretical framework of the practice of "integrated of management and technology". Based on the existing advantages of Nanjing University of Finance and Economics, the following construction ideas are put

forward by integrating management courses and practical courses into the teaching of main Food courses:

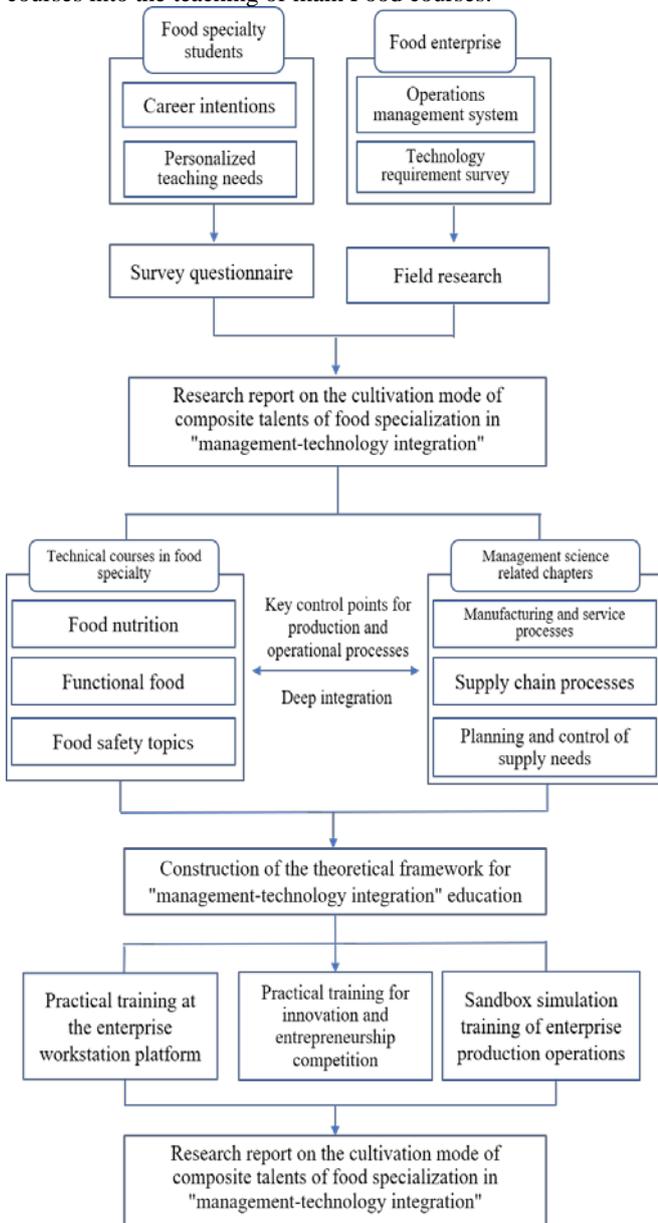


Figure 1. The theoretical framework of “Integration of Management and Technology” teaching

For the teaching content, management science and the related content and organization forms are added to the original content to develop and adjust. At the same time, the college should organize and arrange students' practical training according to the students' career intention, personalized teaching requirements, enterprise production operation management system and production technical requirements.

Firstly, the training of compound talents for Food specialty of "Integrated Management technology" should be researched. Cooperating with enterprises, a compound talents training mode research report can be formed

through questionnaire and on-the-spot investigation of the process of "production operation management system" and "production technical requirements", and find a practice base. Supported by key laboratories of the college, graduate workstations and cooperative enterprises, the colleges may open the laboratory, to provide places for students to carry out scientific research activities under the guidance of teachers.

Secondly, refining the key control points in the process of traditional food and functional food processing, "management science", "manufacturing and service processes", "supply chain process", and "functional supply demand plan and control" section are necessary. And the colleges should set up the "process control" food processing workshop to build and perfect the teaching theory framework, which can make the curriculum knowledge more structured and hierarchical to meet the demand of training interdisciplinary talents of Food. During the courses system construction, according the courses' content and students' vocational interests, the colleges can set up specialized courses selected topic guide direction, and set up "enterprise workstation platform training", "innovative entrepreneurship competition training", "enterprise production operation sand table simulation training" to provide different training programs, such as process control, researching and developing the new type of food material, safety risk control, and food production line design. Through the form of training report, the content and results are concerned and assessed. According to the students' knowledge of the theory course of "management technology integration" and the scores of the students' training report, the overall assessment of the students' learning will be taken as the final grade.

6. CONCLUSION

The major of Food science and engineering of Nanjing University of Finance and Economics, as an old-featured major in our school, has a long history of teaching. However, with the development of the times and the changes in education methods, we have explored a new type of "management technology" training that is more suitable for modern college students. Through continuous optimization of courses, the establishment of training platforms, and improvement of assessment methods, the mode can better personalize innovative training for individual students, and improve students' comprehensive ability to innovate, and also deliver high-quality compound talents to the society continuously.

ACKNOWLEDGMENT

This research was financially supported by the Teaching Reform Project of Nanjing University of Finance and Economics (JGY19048).

REFERENCES

- [1] J Zhang, Y Lv, L Jia, Q He. Construction of practical teaching system of food science and engineering, *Experiment Science and Technology*. 14(003) (2016)171-174. (In Chinese)
DOI:<http://dx.doi.org/doi:10.3969/j.issn.1672-4550.2016.03.053>
- [2] Y. Liu, T. Ku, L. Zhao, G. Gao, Current situation, problem and countermeasures of theory teaching, experiment teaching and practice teaching for undergraduate majoring in food, *Food Engineering*. 3(2015)8-12+40. (In Chinese)
DOI:<http://dx.doi.org/doi:10.3969/j.issn.1673-6044.2015.03.002>
- [3] X. Qiao, Z. Zheng, P. Niu, C. Fu, B. Zhang, Application of practice and innovative thinking in the teaching of food science and engineering, *Academic Periodical of Farm Products Processing*. (10)(2011)145-150. (In Chinese)
DOI:[http://dx.doi.org/10.3969/j.issn.1671-9646\(X\).2011.10.042](http://dx.doi.org/10.3969/j.issn.1671-9646(X).2011.10.042)
- [4] F Pei, W Yang, N Ma, Y Fang, J Xia. Research the construction of multi-level individualized teaching practice system of food science and engineering: taking Nanjing University of Finance & Economics as an example, *Farm Products Processing*. (3)(2020)114-116. (In Chinese)
DOI:[http://dx.doi.org/doi:10.16693/j.cnki.1671-9646\(X\).2020.03.067](http://dx.doi.org/doi:10.16693/j.cnki.1671-9646(X).2020.03.067)
- [5] X. Ye, H. Jin, Y. Zhao, Research of the actuality of practice teaching and reformation design about food science and project specialty in colleges and universities, *Journal of Anhui Agricultural Sciences*. 38(18) (2010)9911-9913. (In Chinese)
DOI:<http://dx.doi.org/doi:10.3969/j.issn.0517-6611.2010.18.198>
- [6] T. Chen, Reflections on the homogenization phenomenon of our country's higher education, *Journal of Nanyang Normal University (Social Sciences)*. 8(2) (2009)111-113. (In Chinese)
DOI:<http://dx.doi.org/doi:10.3969/j.issn.1671-6132.2009.02.024>
- [7] Y. Huang, J. Zhao, Colleges and universities and industry enterprise joint training present situation investigation and analysis, *Education Teaching Forum*. 11(2017)190-191. (In Chinese)
DOI:<http://dx.doi.org/doi:10.3969/j.issn.1674-9324.2017.11.088>