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Construction of Master of Food Science and Engineering - International Student Program in South China University of Technology

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***Abstract*—Master of Food Science and Engineering - International Student Program (MFSE-ISP) is an English-medium master program for international students to study in the field of food science and technology at South China University of Technology. This paper describes the detailed situation of MFSE-ISP from program objectives, teaching system, teaching methods, comprehensive evaluation system, scientific research and practical activities, as well as the management of international students.**

Keywords—Master of Food Science and Engineering - International Student Program, teaching system, teaching method, evaluation system, student management

I. INTRODUCTION

Master of Food Science and Engineering - International Student Program (MFSE-ISP) is an English-medium master program for international students to study in the field of food science and technology at South China University of Technology (SCUT), especially for those students from the countries along "one belt one road".

SCUT is located in the southern Chinese city of Guangzhou. Guangzhou ranks among the top three most economically dynamic and flourishing cities in China, exerting influence on China, Southeast Asia, and the world. In addition to academic achievement, pursuing study in Guangzhou offers a rich lifestyle filled with multi-cultural experiences to international students.

SCUT is one of China's leading universities. It is a member of Project 985 and Project 211 which qualifies it as a top institution of teaching and research. In the latest 2020 World University Ranking of USNEWS, SCUT ranks 16th in mainland China. School of Food Science and Engineering is one of the most important units in SCUT featuring high level innovative scientific research. The School is ranked 4th in the field of Food Science and Technology in 2019 (ShanghaiRanking's Global Ranking of Academic Subjects 2019). It persists in the scientific research and technological innovation, as well as the industrialization of new technology. It takes the student education as the primary task and provides perfect environment for personal development of every student.

MFSE-ISP offers international students a wonderful opportunity to study advancing science technology in the field of food science and engineering and to deeply know China and Chinese culture. Also, through the program, it can be enhanced in the communication and cooperation between SCUT and foreign universities.

II. PROGRAM OBJECTIVE

MFSE-ISP aims to cultivate quality specialists who are well-developed morally, intellectually and physically. Students are required to have good characters and fine scholarship, rigorous learning spirits, and team spirit; be equipped with solid theoretical foundation, specialized knowledge and experimental skills in Food Science; be well informed with the technological developing trends of this discipline; have strong abilities to undertake independent scientific research, design and teaching assignment. Graduates are expected to be competent to engage in teaching, scientific research, manufacturing, and management jobs in the field of Food Science.

Through MFSE-ISP, the first 14 international students were enrolled in September, 2019. They are from 7 countries including Malaysia, Thailand, Vietnam, Laos, Montenegro, Bangladesh and Nigeria. And they are all granted full scholarship, allowing them to study and do research in China without financial worries. They have a good learning environment and excellent scientific research conditions. They can do research which they might not have the conditions in their own country. This is an especially rare and important opportunity for the international students from poor countries.

III. TEACHING SYSTEM

As these international students come from different countries, their basic knowledge and theoretical level are very different, and their study interests are also very different. Therefore, the professional curriculum system is carefully designed to meet their academic needs. At the same time, many domestic and foreign experts and professors from various fields of the food industry were invited to have specialized course for them or act as their master's supervisors.

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A. Curriculum

Total there are 18 courses being arranged for the students, including 8 compulsory courses and 10 elective courses (Table 1).

Table 1 Curriculum

Course Category	Requirement	Course Title	Course Credit	Academic Hour
Public Courses	Compulsory (6 credits)	Chinese Culture	2	32
		Basic Chinese	2	32
		Intercultural Communication	2	32
Professional Courses	Compulsory (10 credits)	Food Process Engineering	2	32
		Food Micro- & Macrocomponents	2	32
		Advanced Food Microbiology	2	32
		Food Innovation	2	32
		Research Methodology and Statistics	2	32
	Elective (only select 9 credits)	Advanced Food Packaging	2	32
		Physical Properties of Foods	2	32
		Current Technology in Food Processing	2	32
		Chemistry and Technology of Food Lipid	3	48
		Chemistry and Technology of Food Carbohydrate	3	48
		Confectionery Science and Technology	2	30
		Advances in Food Dehydration	2	32
		Advanced Sensory Evaluation	3	48
		Modeling in food processing	2	32
		Food Toxicology	2	32

Most international students have a great desire to learn Chinese as they are studying in China surrounded by tremendous and extraordinary Chinese culture. The higher Chinese level the people have, the more affection they will have for China [1]. The three general compulsory courses (Basic Chinese, Chinese Culture, Intercultural Communication) help students learn Chinese and Chinese culture and then better integrate into campus life. These courses are taught in English by experienced Chinese professors. Moreover, students could ask for exemption for these courses if they have learned and passed these courses.

Through five major compulsory courses, students can learn the basic major knowledge. Ten optional courses aim to enhance basic knowledge or develop students' specialty. Students can choose by themselves based on their interest and the credit requirement. The content and planning of each course are carefully designed and arranged by Chinese and foreign experts to meet the specific needs of international students.

B. Teaching by Chinese and Foreign Experts with Doctoral Student Assistant

Each professional course is co-responsible by a Chinese professor and a foreign expert, with a doctoral student as a teaching assistant. These professor and experts not only teach students the basic knowledge and theories, but also bring the latest scientific research progress and trends, which are so colorful and innovative that arouses the great interest of the students. Therefore, some students even expressed their regret that they could not have a longer and deeper study with the experts. The teaching assistant oversee the students' work and progress, help students solve their learning difficulties and guide them to adapt more quickly to the learning and research environment in SCUT. More important, the active thinking of young teaching assistants can also bring more inspiration and innovation to students.

IV. Diversified Teaching Methods

A. Task-driven Teaching Method

The task-driven teaching method is adopted on the teaching of professional courses in order to improve the quality of practice teaching, and to cultivate the ability of practice and creativity [2]. The task was relatively hard and continuously work. Through ongoing work, students improve and expand their knowledge. The practice approves the application of task-driven teaching method can improve the teaching quality through excavating the student's practice and creativity ability and cultivate the capability of independent thinking, exploration and reclamation more effectively.

B. Diversified and Open Teaching Forms

Diversified and open teaching forms, including seminars, open topic homework, essay assignment, etc. Through open homework, students are encouraged to actively search the relevant professional literature, and learn more about the latest research results and developments. At the same time, students can use theoretical knowledge to analyze and solve the practical problems. In the seminar, with the students as the main body, teachers guide properly and help to broaden the students' horizon, flourish thinking, improve logical thinking ability, cultivate creativity, in addition to enhancing the expressive force of language. Essay assignment help students read, analyze and summarize relevant literature, improve their ability of writing professional thesis.

The comprehensive application of these teaching modes not only makes the classroom colorful, but also helps to improve students' enthusiasm and interest in learning, ultimately effectively improve the teaching quality.

C. Group Project and Seminar

Group project and seminar are also very important. The contents are well-designed, based on theoretical knowledge, closely linked to food production and nutrition and health and other practical problems of life.

To organize and work as productively as possible, group projects are headed by teaching assistant. In the group, students work together and share their opinions, which boosts their productivity. Every week they are working on something new, expending and updating their previous work and getting whole picture of the research project. Through the process of preparing for the seminar, students learn to cooperate, have team spirit, improve work efficiency. In seminars, students are guided to think, analyze and inspire innovation.

V. Comprehensive assessment and evaluation system

International students come from countries with different cultural backgrounds and living habits and differ significantly from domestic students in many aspects. They are deeply influenced by the western social system and free thought. These international students are mostly from southeast Asia, the Middle East and Africa. Most of them are influenced by their original living habits, lack of organization and discipline, and have a weak sense of time. Their educational level of different groups varies greatly [3].

A comprehensive assessment and evaluation system is established. The assessment forms include attendance, homework, quiz, essay assignment, group project, presentation, etc. The after-class task focuses on the exploration and brainstorming in order to guide students to pay attention to the frontier development and current hot spots. The presentation and discussion exercise the students' language expression ability, the improvisational ability. Writing is an important skill of a master's student. Every course includes essay assignments to improve students' ability of analysis, summary and writing. A comprehensive and open evaluation system can not only reduce the pressure of final exams for students, push and encourage international students to study actively, but also strengthen the management and assessment of the learning process for international students, and the feedback on the final learning effect.

VI. Scientific Research and practical activity

At SCUT, all students have a wide range of research choices and research opportunities, which for some international student it seems like a dream. The students all cherish this opportunity.

A. Thesis Proposal

The thesis proposal is the first test of the students' scientific research work. Under the guidance of the supervisor, students design and arrange their scientific research work through retrieving and reading the literature, and then form the relevant reports. There were a large number of the works for students to accomplish. Through these works, students explore new fields, deepen and enrich professional knowledge. Such works allow them to discover new methods of work, to discover new technologies and will benefit their scientific research. This year, due to the outbreak of COVID-19, supervisors' guidance are conducted online, which is undoubtedly a test of students' ability to learn independently.

B. Periodic reports

Periodic reports is a summary of the students' study and research work at this stage and will be made every six months. Domestic and overseas experts will review the students' scientific research progress, evaluate their scientific research ability and put forward constructive suggestions. What's more, this helps students learn to self-summarize and improve, and can properly plan their own learning and research programs.

C. Internship and Social Activities

SCUT developed many training bases at factories and enable students to do field work. Moreover, many enterprises and supervisors have a long-term scientific research cooperation. They can also provide many practice opportunities for students. International students will be provided the opportunity to visit modern factories, such as Guangdong Yantang Dairy Co., Ltd., Guangzhou Zhujiang Brewery Group Co., Ltd., Want Want China Holdings Ltd. etc. Also, they can have in-depth exchanges and discussions with experts and senior workers. Thus, students can study to combine practice with theory, to analyze and solve production practice problems, have an in-depth understanding of advanced production technology and rich management experience of modern food factories. This is an excellent opportunity especially for students from some developing countries.

VII. Students management

These international students are in separate class and are managed by School of International Education and School of Food Science and Engineering. School of International Education is primarily responsible for the teaching of public courses and the daily management of students. School of Food Science and Engineering is mainly responsible for the teaching of professional courses as well as scientific research work and tasks, with a professional teachers as head teachers responsible for professional curriculum management and scientific research, practical activities of the organization and development.

Through two-way choice, each student has his own supervisor. Supervisors are responsible for the students' scientific research work. So, the communication between supervisors and students is very important. Supervisor meets with student every week, so as to carefully know the student's personal learning and scientific research work, and to provide timely and effective guidance.

To analyze the problems and overcome difficulties these international students face in their daily life and study in China, and to explore culture shock and acculturation process of them, many approaches were applied. Language barriers are a prominent problem [4].

In order to let the new international students get to know and integrate into campus life as soon as possible, old international student will be arranged to assist them in various admission procedures and visit the campus. Supervisor will meet with students, arrange for them visit and learn about the lab. Moreover, due to the weak knowledge base of some international students, they are required to start participating in scientific research activities as soon as possible if time permits. They will be also offered one-on-one help from a doctoral or second-year master's student.

Unfortunately, because of the outbreak of COVID-19 this year, most of the international students have to leave China and return to their country. Although many students are very far from China, they are keeping close contact with teachers and supervisors. They all can get enough assistance including psychological, physical aspects and learning adjustment by using various online applications. Under the guidance of supervisors, students can keep reading professional literature and continuing their research work. Also, the physical condition of the students is a matter of great concern to the supervisors. With these approaches, the school show how much it care about its students and how caring everyone is.

VIII. Conclusion

Master of Food Science and Engineering - International Student Program (MFSE-ISP) has been successfully established, including program objective, teaching system, diversified teaching methods, comprehensive assessment and evaluation, scientific research and practical activity, students

management. In the future, more and more international students will come and study in China. This will help to expand the communication between China and other countries, as well as the academic exchanges between SCUT and other universities. Only by building a better program, more and more international students can be attracted to study in our country. And the integration of food science education in our country with international education will also be promoted.

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