

Challenges of Undergraduate Programs in Chemical Processing Engineering of Forest Products in Universities of China

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Seven universities in China currently offer undergraduate programs in chemical processing engineering of forest products (CPEFP), which play a crucial role in training professionals to meet the evolving demands of the forest-based chemical industry. However, these programs in Chinese universities face several challenges that require attention in order to better serve the development of the forest chemical industry.

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CPEFP Undergraduate Education in China

China is a country with abundant forest resources, and forestry plays a significant role in its economy and environment. The country's pine resin industry holds a prominent global position and finds diverse applications in construction, cosmetics, coatings, pharmaceuticals, and other fields. Capitalizing on China's unique forest resources and cultural heritage, universities in the country have developed specialized undergraduate programs known as chemical processing engineering of forest products. The inception of China's first undergraduate program in CPEFP dates back to 1956. Over the years, the number of universities offering this program has experienced fluctuations. As of 2022, seven universities in China continue to admit undergraduate students into CPEFP. These universities include Beijing Forestry University, Northeast Forestry University, Nanjing Forestry University, Northwest Agriculture and Forestry University, Central South University of Forestry and Technology, Jiangxi Agricultural University, and Shenyang University of Chemical Technology.

The CPEFP programs offered by these universities are designed to educate and nurture professionals specifically for the forest chemical industry. These programs have a focused curriculum that aims to provide students with knowledge, skills, and practical experience related to the utilization of forest resources in chemical engineering. It is important to note that the programs do not specifically focus on the pulp/paper or wood-based panels industries. In addition to the CPEFP programs, China offers other specialized programs, namely light chemical engineering and wood science and engineering. These programs are dedicated to cultivating talents in their respective fields. Students enrolled in the CPEFP programs undergo rigorous training in various areas, including the extraction and processing of forest-based materials, the development of value-added products, and

the sustainable utilization of forest resources. The goal is to produce graduates who are well-equipped to contribute to the advancement of the forest chemical industry, both in terms of technological innovation and sustainable practices.

The “Unpopularity” of a Niche Major during the College Admissions

During the annual Chinese college admissions (*Gaokao*), as a niche major, the CPEFP programs often struggle to attract the attention of students and parents, becoming an “unpopular” choice. This “unpopularity” is reflected in the low first-choice rate of the CPEFP programs, with most freshmen being students who were allocated to these programs through the major adjustment process during the admissions. This lack of popularity can be attributed to three main characteristics of the CPEFP programs, as follows.

Limited Program Size: the CPEFP programs are offered by a small number of universities, only seven institutions nationwide. In terms of overall enrollment, these programs have relatively small student populations, and the annual number of graduates does not exceed 300. Due to the limited number of graduates in these programs, it is difficult for them to establish a significant reputation in society, resulting in limited attention from students and parents during the college admission process.

Low Social Awareness: the CPEFP programs are less known to students and parents due to its specialized nature. In some cases, a program may be completely unfamiliar. As an obscure niche program, individuals can only interpret the program by its name and make assumptions, leading to limited understanding and influencing the choices of students and parents. Moreover, there may be misconceptions or generalizations about the CPEFP programs. For instance, the CPEFP programs are often associated with remote areas or frontline positions. They are perceived to have challenging work environments, low income, and a low social status. These predetermined perceptions do not match the expectations of students and parents, impacting their objective understanding and choices regarding CPEFP programs.

Clear Industry Orientation: the CPEFP programs have specific talent development objectives and are tailored to forest chemical industry or government institutions. If students and parents lack awareness or interest in these specific fields, they are unlikely to pay attention to or consider these programs. Even professionals working in related fields would not choose these programs if they do not plan to pursue careers in these specific fields. The strong industry orientation effectively excludes a significant portion of students and parents.

Possibilities

CPEFP, as a distinctive program in forestry related universities, serves as a crucial talent pool for the forest chemical industry. To tackle the challenges related to enrollment and employment in CPEFP undergraduate education, certain measures need to be implemented.

Efforts should be made to systematically publicize the characteristics, learning requirements, employment prospects, and development trends of the CPEFP programs. This promotion should not only be targeted towards students within the programs, but should also aim to raise understanding of the features and prospects of the CPEFP programs within the society. In addition, colleges can collaborate with forest chemical enterprises to provide a special funding for the CPEFP programs, assisting students in completing their

studies, reducing their financial burden, and thereby enhancing the attractiveness of CPEFP programs.

It is of paramount importance to optimize the curriculum and practical training of CPEFP programs, aligning them with the rapidly evolving demands of the forest chemical industry. Alongside imparting specialized knowledge, it is essential to enhance students' understanding of the development trends of forest chemical industry, improve their awareness of large-scale enterprises within the field, and provide them with preliminary insights into job positions and responsibilities. In particular, a key aspect is to augment students' practical experiences within forest chemical enterprises by implementing an "internship + employment" education model. This aims to foster students' comprehensive quality and strengthen their understanding of the realities of the workplace.

For forest chemical enterprises, it is essential to cultivate a positive reputation and appeal among CPEFP graduates. This entails effectively integrating these graduates into workforce and assisting their transition into professional roles. To achieve this, it is crucial to align the development of graduates with the performance evaluation of company managers. Emphasizing the importance of incentivizing graduates and expanding their development opportunities is paramount. A competitive salary system and a promotion mechanism should be established. Additionally, creating favorable conditions and improving the working and living environment for graduates is necessary. Providing timely support to address any practical challenges they may encounter is also vital.

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