

Exploration of Talent Cultivation Mode for Biomedical Professional Groups Based on Industrial Demand

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Abstract: With the rapid development of the biomedical industry, the demand for talents in related majors is also increasing. However, it is worth our deep discussion and improvement to explore whether the current talent cultivation mode for biomedical majors can meet the needs of the industry and whether there are some problems and deficiencies. In China, the biomedical industry is regarded as one of the strategic emerging industries, and the state has also issued a series of policies to support its development. However, the development of the industry cannot be separated from the support of talents, making the exploration of talent cultivation mode for biomedical professional groups particularly important. From an industrial perspective, the demand for talents in biomedical enterprises mainly focuses on research and development, production, sales, and technical support. Therefore, the exploration of talent cultivation mode for biomedical professional groups should be centered on these aspects to better meet the needs of the industry. The exploration of talent cultivation mode for biomedical professional groups based on industrial needs requires comprehensive consideration and improvement from multiple aspects. Only in this way can we better meet the development needs of the biomedical industry and provide strong talent support for the development of China's biomedical industry.

1. Background

1.1 Development Background and Trends of the Biomedicine Industry

With the development of society and advancements in technology, the biomedicine industry has increasingly garnered global attention and gradually become one of the pivotal industries supporting China's economic growth^[1]. Against this backdrop, the exploration of talent cultivation models for biomedical majors becomes particularly significant. The biomedicine industry is growing rapidly, and the demand for talent is also increasing. However, there are currently issues in the cultivation of talent in China's biomedical majors, which seriously impact the quality of talent cultivation and hinder the development of the industry^[2]. To address these issues, it is necessary to reform and explore talent cultivation models for biomedical majors based on industry demands. Exploring talent cultivation models for biomedical majors based on industry demands is a formidable task that requires concerted efforts from the government, universities, enterprises, and all sectors of society to achieve substantial results.

1.2 The Importance of Talent Cultivation in Biomedical Majors

With the rapid development of the biomedicine industry, the demand for talent is also growing. The importance of talent cultivation in biomedical majors is self-evident. Only by cultivating high-quality, highly skilled biomedical professionals can we meet the needs of industry development and promote the further development of China's biomedicine industry^[3]. The exploration of talent cultivation models for professional clusters aims to find a suitable approach that equips students with professional knowledge while also developing their practical and

innovative abilities. The importance of talent cultivation in biomedical majors lies in meeting the needs of industry development and driving industrial progress. Only through continuous exploration and innovation can we cultivate high-quality biomedical professionals and contribute to the prosperity of China's biomedicine industry.

1.3 Key Technologies and Talent Demands in the Development of the Biomedicine Industry

The biomedicine industry is a highly technology-intensive industry, with key technologies including biotechnology, drug research and development, medical device technology [4]. At the same time, the demand for talent in the biomedicine industry is highly specialized, requiring individuals with relevant professional knowledge and technical skills. Based on this understanding, we can further explore talent cultivation models for biomedical majors based on industry demands. Only by strengthening the curriculum of professional courses, focusing on the cultivation of practical abilities, interdisciplinary training, and innovative ability can we better meet the development needs of the biomedicine industry and cultivate more high-quality biomedical professionals.

2. Current Status of Talent Cultivation in Biomedical Majors

2.1 Current Status of Talent Cultivation in Biomedical Majors in China

Currently, the cultivation of talent in China's biomedical majors still faces several challenges [5,6]. Firstly, there is a disconnect between the talent cultivation system and industry demands, leading to difficulties in employment for graduates. Secondly, the curriculum is overly theoretical, lacking the cultivation of practical operational abilities. Additionally, inadequate faculty resources and outdated laboratory facilities also affect the quality of talent cultivation. To address these issues, it is necessary to reform the talent cultivation models for biomedical majors. On the one hand, curriculum settings should be adjusted according to industry demands to strengthen the cultivation of practical operational abilities. On the other hand, efforts should be made to strengthen the faculty team and improve the level of laboratory facilities. In summary, the talent cultivation models for China's biomedical majors need innovation to meet the demands of industrial development.

2.2 Issues and Challenges in Talent Cultivation at the Current Stage

In the current trend of technological advancement, the biomedicine industry is rapidly developing, and the demands of the industry pose greater challenges for professional talent. However, in the current stage of talent cultivation, we still face several issues and challenges.

2.2.1 Mismatch between Talent Cultivation and Industry Demands

The current talent cultivation models for biomedical majors are overly theoretical, lacking opportunities for practical operation, which makes it difficult for students to directly compete for jobs in the industry after graduation. The industry demands diversified talent with both practical abilities and innovative spirits, putting graduates at a relative disadvantage in the job market.

2.2.2 Overly Homogeneous Curriculum Settings

The curriculum for biomedical majors often focuses too much on the acquisition of professional knowledge, neglecting the cultivation of interdisciplinary comprehensive abilities. However, with technological advancements, the development of the biomedicine industry increasingly relies on the cross-integration of multiple disciplines, making the existing talent cultivation models difficult to meet the development needs of the industry.

2.2.3 Insufficient Practical Teaching Resources

Practical teaching is an important way to cultivate students' practical abilities and innovative spirits. However, there is a notable lack of practical teaching resources in the current biomedical majors. Issues such as insufficient laboratory equipment, homogeneous practical teaching projects, and limited opportunities for cooperation with enterprises all limit the improvement of students'

practical abilities.

3. Construction of a Talent Cultivation Model for Biomedical Majors Based on Industry Demands

3.1 Determination of Cultivation Objectives

When determining the cultivation objectives for biomedical majors, it is essential to consider the specific demands of the industry. Therefore, our cultivation objectives are centered on equipping students with a solid foundation in biomedical basic theoretical knowledge, strong experimental operational abilities and innovative consciousness. At the same time, we also emphasize the cultivation of students' practical work abilities and professional qualities. Firstly, the basic theoretical knowledge that students need to master includes the core content of biology, medicine, and pharmacy, as well as an understanding of the frontier developments in biomedical advancements. Secondly, the cultivation of experimental operational abilities and innovative consciousness is crucial for this major. We not only provide sufficient experimental equipment and technical support but also encourage students to participate in scientific research projects to cultivate their abilities to think independently and solve problems. Furthermore, the cultivation of practical work abilities and professional qualities is indispensable. Through cooperation with enterprises, we conduct internships, workshops, and other activities to enable students to understand enterprise operations, grasp actual work processes, and enhance their professional qualities. In general, our cultivation objectives are to produce biomedical professionals with a solid theoretical foundation, practical abilities and innovative consciousness, as well as good professional qualities.

3.2 Curriculum System Design

In designing the curriculum system, we should fully consider the development trends and talent demands of the biomedical industry. The curriculum should not only cover basic knowledge in biology, medicine, and chemistry but also include the latest content on biotechnology, drug development, and medical devices. Additionally, emphasis should be placed on interdisciplinary integration, such as bioinformatics, biomaterials science, and biopharmaceutical science. The curriculum system design should focus on the cultivation of practical abilities and innovative consciousness. This can be achieved through various methods such as laboratory practice, internships, and innovation and entrepreneurship projects. At the same time, students should be encouraged to participate in domestic and international academic conferences and competitions to enhance their academic communication and teamwork abilities. The curriculum system design should also consider students' career planning and development. Schools can cooperate with enterprises to conduct career planning guidance, internships, and employment assistance, helping students better understand industry trends and employment prospects, and providing guidance and support for their future development. In summary, exploring a talent cultivation model for biomedical majors based on industry demands requires starting with the curriculum system design, emphasizing the integration of basic knowledge and the latest technology, the cultivation of practical abilities and innovative consciousness, as well as students' career planning and development. Through these measures, we can better meet the talent demands of the biomedical industry and cultivate competitive high-quality talent.

3.3 Construction of Practical Teaching System

The construction of a practical teaching curriculum system should closely align with industry demands, with a focus on cultivating students' practical operational abilities and innovative consciousness. Firstly, the curriculum should be optimized to strengthen practical teaching links such as experiments, internships, and training, enabling students to master professional knowledge through practical operations. Secondly, cooperation between schools and enterprises should be strengthened to build an integrated platform for industry, academia, and research, providing students with opportunities for internships and employment. Additionally, emphasis should be

placed on cultivating students' interdisciplinary comprehensive qualities to improve their adaptability in actual work. In the process of practical teaching, the construction of the teacher team is also crucial. Teachers should possess rich industry experience and teaching abilities to guide students in correctly mastering practical skills. Furthermore, the construction of an evaluation system cannot be ignored. Students' practical operational abilities, innovative abilities, and comprehensive qualities should be the main evaluation criteria, fully leveraging the guiding role of the evaluation system. In summary, exploring a talent cultivation model for biomedical majors based on industry demands requires starting with the construction of a practical teaching system, optimizing curriculum settings, strengthening cooperation between schools and enterprises, paying attention to the construction of the teacher team, and improving the evaluation system. Through these measures, it is helpful to cultivate biomedical talent that meets the demands of industrial development.

3.4 Teacher Team Construction

Teacher team construction is a crucial link in realizing a talent cultivation model for biomedical majors based on industry demands. To improve the overall quality of the teacher team, exploration is needed in the following aspects: Firstly, strengthen teacher training. By regularly organizing teachers to participate in professional skills training, industry practice, academic exchanges, and other activities, we can enhance teachers' professional level and practical abilities. At the same time, teachers are encouraged to obtain relevant industry qualification certificates to improve their competitiveness within the industry. Secondly, optimize the teacher structure. Based on the development trends of the biomedical industry, we should introduce professional talent with rich industry experience and educational teaching abilities to enrich the teacher team. At the same time, strengthen cooperation and exchanges both inside and outside the school, inviting industry experts and technical backbones from enterprises to serve as part-time teachers, providing students with more practical experience and cutting-edge knowledge. Thirdly, establish a teacher incentive mechanism. Lastly, strengthen the construction of teachers' ethics and conduct. Strengthen teachers' professional ethics education, standardize their teaching behavior, and create a good educational and teaching atmosphere. Through the above measures, we can provide strong support for the implementation of a talent cultivation model for biomedical majors based on industry demands.

3.5 Exploration of an International Cultivation Model

Exploring an international cultivation model is imperative to meet the ever-changing demands of the biomedical industry. This model should combine industry development trends, fully consider students' career development needs, and the internationalization level of educational and teaching resources. Firstly, the curriculum system for biomedical majors should be aligned with international standards. At the same time, strengthen the construction of the teacher team, encourage teachers to participate in international academic exchanges, and improve their teaching and research levels. Secondly, strengthen international cooperation and exchanges to provide students with opportunities for overseas study and internships. Lastly, strengthen practical teaching links to enhance students' practical operational abilities. The biomedical industry is highly practical, so practical teaching is an important link in cultivating biomedical talent. Through cooperation with enterprises, establish practical teaching bases to provide students with opportunities for practical operations and improve their practical abilities. The biomedical industry is in a stage of rapid development and requires a large number of talent with innovative spirits and entrepreneurial abilities. Therefore, in the process of talent cultivation, emphasis should be placed on cultivating students' innovative thinking and abilities, providing support and guidance for innovation and entrepreneurship. In summary, exploring a talent cultivation model for biomedical majors based on industry demands should combine industry development trends, fully consider students' career development needs, and the internationalization level of educational and teaching resources. Through the exploration of an international cultivation model, we can improve the quality of biomedical talent cultivation, meet industry demands, and promote the development of the biomedical industry.

4. Conclusions and Suggestions

4.1 Conclusions

In the exploratory research on the talent cultivation model for the biomedical professional group based on industrial demands, we have drawn the following conclusions: Firstly, industrial demands serve as the core driving force for reforming the talent cultivation model for the biomedical professional group. By deeply understanding the actual demands of industry enterprises, we can more accurately grasp the direction and goals of talent cultivation, enhancing the pertinence and practicality of talent training. Secondly, talent cultivation for the biomedical professional group should focus on the cultivation of practical abilities and innovative capabilities. Practical abilities can be developed through cooperation with enterprises and the implementation of industry-academia-research projects, allowing students to hone their skills in practical work. Innovative capabilities can be fostered by encouraging students to participate in scientific research projects, thereby cultivating their innovative thinking and research abilities. Thirdly, the talent cultivation model for the biomedical professional group should emphasize the construction of the teaching staff. Introducing and cultivating a group of teachers with rich industry experience can better meet the needs of talent cultivation for the professional group. Lastly, a quality assurance system should be established and improved to ensure the implementation effect of the talent cultivation model. Through regular evaluations and feedback, the talent cultivation plan can be timely adjusted and optimized to guarantee the quality of talent training. In summary, the exploration of the talent cultivation model for the biomedical professional group based on industrial demands requires efforts in multiple aspects, including practical abilities, innovative capabilities, teaching staff construction, and quality assurance, with the aim of cultivating outstanding biomedical professionals who meet the needs of the industry.

4.2 Suggestions

In the exploratory research on the talent cultivation model for the biomedical professional group based on industrial demands, we propose the following suggestions: ① Establish a curriculum system closely linked to the industry to ensure that the teaching content aligns with actual work demands. ② Strengthen practical teaching by increasing students' opportunities for hands-on operations, thereby enhancing their professional skills and competencies. ③ Enhance the construction of the teaching staff by introducing experts and technical leaders from the industry to improve teachers' teaching abilities and practical experience. ④ Establish an industry-academia-research cooperation platform to facilitate interaction and resource sharing between schools and enterprises. ⑤ Emphasize the cultivation of students' innovative capabilities and entrepreneurial spirit by encouraging them to participate in scientific research projects and entrepreneurial practices. ⑥ Strengthen students' career planning and employment guidance to help them better understand industry demands and development trends, thereby improving their employment competitiveness. ⑦ Establish an evaluation and feedback mechanism to regularly assess and adjust the talent cultivation model to ensure its adaptability to industrial demands. Through the implementation of the above suggestions, we can better cultivate biomedical professionals who meet industrial demands, thereby promoting the development and progress of the industry.

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Declaration of Competing Interests

The authors affirm that they do not have any financial or personal conflicts of interest that may have potentially influenced the research presented in this paper.

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