Curriculum and Specialty Construction of Biotechnology Education at Medical Colleges and Universities

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Abstract. Biotechnology specialty is a multidisciplinary and experimental specialty. With the development of modern science and technology and the transformation of traditional disciplines, interdisciplinary development is the main trend of science in the world now. The multidisciplinary crossing has become the power to promote the development of discipline. The development of multidisciplinary crossing specialty and interdisciplinary biotechnology education has increasingly become the urgent request of institutions of medical colleges and universities. The biotechnology education need to renew educational ideas, integration of resources, improve the management mechanism and solve the problems of the disciplines development and the theory and experiment curriculum construction and teacher team construction.

Introduction

Biotechnology is the most revolutionary and influence profession to the development of science and technology, which has broad application prospects in many fields. Because of the biotechnology occupies an important position in modern human life, the demand for professional talents of biotechnology are becoming more and bigger. In order to adapt to the needs of society, many universities have set up the biotechnology specialty, for training many useful talents. Biotechnology specialty is a cross discipline of biology, medicine, pharmaceutical and biotechnology engineering in the medical colleges and universities. With the development of science and technology, the problems of human society become more and more integrated, complicated. Only a single discipline is not enough to solve the practical complex problems. The trend that multidisciplinary joint problem solving commonly has become increasingly apparent. Science research emerged development signs from highly differentiated to cross comprehensive, thus the formation and development of cross disciplines were respected gradually by all walks of life. Each specialty in colleges and universities, establishing interdisciplinary courses, developing interdisciplinary education is imminent. The biotechnology education has some problems of interdisciplinary curriculum setting and construction and teacher team construction that need prompt solution.

The Problems of Biotechnology Specialty Development in the Medical Colleges and Universities

The traditional disciplinary layout and biotechnology specialty development. The biotechnology specialty is a interdisciplinary specialty. The Classification of Instructional Programs has not corresponding subject position and interdisciplinary there would be no "legal status", which are often placed in a marginalized position, innovation and development of cross subject is
impossible, the set of disciplines profession is very detrimental to the survival and development of interdisciplinary education, so as to not get the recognition and security of system. In recently years, although the state started to gradually promote interdisciplinary research and development of interdisciplinary specialty, the effect is not significant. Under the existing scientific research and teaching management system, professional discipline is the basic premise and important basis of the talent training, project (funds) to apply for, title evaluation, academic degree setting [1]. Medical colleges and universities, the advantaged disciplines are clinical medicine, anesthesiology, imaging, oral medicine, etc. Therefore, the policy, institution and the funding distribution are inclined to all these disciplines, and the survival and development of biotechnology specialty-the interdisciplinary specialty, also need to give more support.

The management mechanism and evaluation mechanism. The basis and premise of the interdisciplinary specialty are numerous resources sharing in the process of the teaching and scientific research. But, under the existing management system, because of the disciplines and specialties belonged to different departments, the teaching and scientific research equipment, facilities and so on also distribute in their respective labs. The administrative division of the management system weakens the exchanges and communication between disciplines and disciplines. The interdisciplinary specialty development not only lacks the platform constructions that possess practical utility and good development foundation, but also lack the unified top design and construction goal. At present, the biotechnology education mainly depend on the amateur hobby of some teachers in the field of interdisciplinary, which lack of a relatively stable and mature research base and research staff, thus the specialty construction and development are in dilemma. Lacking of long-term top design and reasonable equipped with all kinds of resources is difficult to fundamentally solve the problem of lack of interdisciplinary construction platform. Interdisciplinary as a result of a multidisciplinary interaction fusion, that has a high interdisciplinary nature. The more the subjects’ research, the more difficult understood of the interdisciplinary. Even if a particular is a discipline professional expert, due to the different of their own knowledge structure, he may also be "outsider" when facing interdisciplinary field. So, the interdisciplinary involving many of the content that is often difficult to achieve consensus, thus which give relatively independent evaluation system and standards formulation of interdisciplinary some problem.

The Curriculum Construction of Biotechnology Specialty

To strengthen the theory curriculum system construction. The biotechnology specialty belong to a characteristic disciplines, features of curriculum structure system show the cultivation of basic skills of the core curriculum, that aspire to consider professional design requirements, highlight the intersection integration of multidisciplinary curriculum, cultivate applied talents. Establishing a teaching system of subject discipline group, which break of the conditions of various courses independently and no relation each other of biology, medicine, pharmacy, engineering and so on, and establish the curriculum group. Biotechnology specialty curriculum group: cellular structure and function curriculum group, (biochemistry, molecular biology, cell biology, genetics, etc), the human body structure and function curriculum group (human anatomy, organization and embryology, physiology, etc), bioengineering curriculum group (cell engineering, gene engineering, protein engineering, etc), medical and pharmaceutical curriculum group (introduction to medicine, pharmacology, pharmacy, etc). In the preparing of courses group, paying attention to the relationship between curriculum, the integrity of knowledge, especially the teaching content crossing in group and between group to group, curriculum group teaching avoided problems of the omission of subject teaching contents, repeated, cohesion improper and so on, which conducive to the mutual penetration, mutual fusion, mutual complement between multidisciplinary. Course integration within the group, that is advantaged to form a more complete and effective knowledge framework and research concept in the learning process of students, which to adapt to the highly differentiated and highly integrated characteristics of modern science technology and highly comprehensive development trend, the
integrated curriculum changed the phenomenon of branch carefully and course too much, period of cutting which give students white space to learning autonomously and pay attention to the cultivation of the students’ practical ability and innovative thinking ability [2]. Biotechnology specialty is the science of more practicality, needing to accumulate and understand in practice. According to the requirements of training compound and practical talents, the curriculum should also pay attention to strengthen students' manipulation ability and the cultivation of the innovative thinking ability, and increase the proportion of compulsory course experiment, and open skills experiment of much of contents. In addition to, biotechnology specialty should actively joint outside enterprises, explore the methods of university-industry cooperation in running schools, provide platform for practice and employment of our students to grow up.

The construction of biotechnology experiment curriculum. For the aspects of teachers, teachers only pay attention to the theory teaching methods, but little effort on the design and reform of the experimental teaching, open experiment content tend to be relatively simple verification experiment, which is not conducive to cultivate students' comprehensive quality, innovative thinking and innovative ability. The contents of the experiment teaching are not enough scientific and reasonable. Verification experiments are too much and the comprehensive and innovative experiments are too little, which is the common defect of currently biotechnology major multi-disciplinary course. The formation of this kind of condition have various reasons, on the one hand the teachers do not pay attention to the experiment teaching and experimental teaching reform, on the other hand, the lack of system, perfect and advanced instruments and equipment. The development of modern biotechnology and the invention of advanced instruments and equipment are closely linked, there is no modern equipment, many more advanced biotechnology experiment cannot be developed, and the students will not be able to understand and grasp the advanced technology and methods, which is very bad for the students' professional skills training. There have many points to be further improved in the biotechnology experiment teaching, to improve the current situation. First, we should change the idea of weighting theory and lighting experiment, put theoretical teaching and experimental teaching in same status, to the organic combination of theory and experiment, theory to guide the experiment, at the same time in the experiment to test master and apply of theoretical knowledge. Next, we should pay attention to the construction of experimental teaching platform, to provide better conditions for experimental teaching, which can provide students the chance that can grasp the basic professional technique, and understand and grasp the forefront professional technology, which can guarantee produce high quality and meet the demand of social development and qualified biotechnology professionals.

The Teacher Team Construction of Biotechnology Specialty

Teacher team construction is the key factor in course construction. Teacher as an organizer and practitioners of teaching activities, it is the stipulator of teaching content. Teachers must have advanced education concept and must innovate in the practice of teaching. In the teaching process, how to deal with the relationship between the teaching content and teaching material, the relationship between teaching and scientific research, the relationship between knowledge education and quality-oriented education, which also requires teachers hold effectively. Teaching methods as tools and means of teachers engaged in teaching, it is of great significance to achieve the teaching goal and improve the teaching effect. Teaching method is an organic system composed of various kinds of teaching factors, which has the extremely rich connotation and denotation. First-class teaching methods focus on their aptitude, and use students willing to accept the logic form, implementing the vivid and rich form such as intuition, heuristic, discussion-based, participatory, case type and so on, and advanced means of teaching, to stimulate students' interest in learning. Teachers are the designers and implementers of teaching methods. In the teaching practice, there is good curriculum design and no good teaching methods and means, it is often difficult to achieve good teaching results. Similarly, the same teaching content, different teachers can make different teaching effect. Therefore, the
innovation of teaching methods is an important part of the curriculum construction. Biotechnology specialty cultivate applied talents, which require students to master the base of deep biological theory and further master the theories and skills relation to biotechnology, which play an important role for the development of 21st century biological high-tech industry [3]. Biotechnology specialty orientate in the direction of medicinal biotechnology, then the teachers should possess solid professional knowledge of biology, medicine, pharmacy, and cell engineering, gene engineering, protein engineering and other engineering and familiar with enterprise production and management, etc. At present, as a result of the limitation of traditional education mode and subject classification, most of the teachers' knowledge structure is relatively single, knowledge narrow, which also affect the quality of the interdisciplinary specialty personnel training in a certain extent. Thus, the biotechnology specialty should consider the discipline orientation, targeted to do the work of talent introduction and teachers training. The interdisciplinary specialty teachers should not only have good presentation skills, strong ability of organization and management, proper evaluation ability and other teachers' professional abilities, but also should have solid multidisciplinary professional knowledge.

**The requirements of curriculum construction to teacher team construction.** Course construction is a systematic and continuous behavior, which need to appear in the form of team cooperation and the new generation. Especially the support of fine course lies in the influence and prestige of the teacher group, the major teaching scientific research achievements, the quality of cultivation talents, a stark feature in the teaching reform, and these need to through the team cooperation for a long time of development and accumulation in the course construction. Pay attention to the outstanding teachers’ echelon construction, building excellent teaching team. To train the teachers troop, to achieve high quality curriculum teaching relay. Teachers echelon should have a reasonable knowledge structure, age structure, title structure, institute structure, at the same time, also should pay attention to the faculty configuration of every link of course teaching. Only in this way, a fine course teaching don't interrupt the work because of one teacher quit teaching. Teachers are the engineer of the human soul, shoulder the task of the teaching, the personality charm have great impact on teaching effectiveness. Fine course as a demonstration course, especially should attach importance to teacher's ethics construction, attach importance to improve the teachers to the students and even the whole society's ethics construction, attach importance to improve the teachers to the students and even the whole society's ethics construction. Without a high level teaching research achievements and solid subject construction achievements as support, improving the quality of teaching is only empty talk. Therefore, in teaching lead the scientific research, with scientific research promoting teaching and research results apply to teaching, realizing the interaction between teaching and scientific research. Teaching and scientific research results can improve the academic level and teaching level of teachers, that is helpful to teachers to study teaching and improve the quality of teaching at a higher starting point, on the premise of raising the overall level of teachers, enhance the overall level of the course construction.

**The teaching and researches complement each other.** To improve the teaching quality and level, we must take an active part in the education teaching research. Without a high level teaching research achievements and solid subject construction achievements as support, improving the quality of teaching is only empty talk. Therefore, in teaching lead the scientific research, with scientific research promoting teaching and research results apply to teaching, realizing the interaction between teaching and scientific research. Teaching and scientific research results can improve the academic level and teaching level of teachers, that is helpful to teachers to study teaching and improve the quality of teaching at a higher starting point, on the premise of raising the overall level of teachers, enhance the overall level of the course construction.

**Summary**

Medical colleges possess of natural advantages of completely related disciplines of medicine, profession diverse and high-level talent agglomeration, high level of teaching and scientific research, so it possesses of unique objective conditions to develop interdisciplinary of biotechnology etc. And how to give full play to the advantages, integrate subject resources, strengthen the crossing fusion between subjects profession, strengthen the theory and experiment curriculum construction and teacher team construction, which is the problem of currently worth further discussing.
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References

