

Research on the Teaching Reform of Interdisciplinary Education based on the Cultivation of Comprehensive Quality Talents

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Abstract. Interdisciplinary teaching refers to crossing the boundaries between disciplines, establishing the relationship between disciplines on the basis of paying attention to the internal logic of each discipline, and integrating the disciplines, and then implementing the integrated multidisciplinary integration teaching in teaching practice. Research universities should not only cooperate to solve these interdisciplinary problems, but also make full use of their rich research resources and intellectual resources to teach students the ability to use multidisciplinary knowledge, ask questions, analyze problems and solve problems creatively. Interdisciplinary education helps to optimize the knowledge structure of college students, cultivate their comprehensive quality and improve their comprehensive quality, which is an inevitable choice for cultivating innovative talents. To implement interdisciplinary education for college students, we must innovate interdisciplinary teaching design and organizational form of interdisciplinary education for college students; Strengthen interdisciplinary academic exchanges, reform the interdisciplinary talent training mechanism and improve the guarantee mechanism for interdisciplinary talent training.

Keywords: Teaching Reform; Interdisciplinary Education; Comprehensive Quality Talents.

1. Introduction

At the beginning of the 21st century, China's higher education is developing rapidly and faced with many difficulties. Its rapid development comes from the continuous growth of external supply, and its development difficulties come from the conflict between internal traditional structure and new educational ideas. This dilemma gave birth to the continuous reform upsurge of universities at all levels in contemporary China [1]. With the continuous expansion of the scale of college education in China, improving the quality of college education in an all-round way and cultivating comprehensive quality talents have become the core issues of deepening the reform of college education. Interdisciplinary teaching is helpful to cultivate talents with global competitiveness. In recent years, many western countries have been paying attention to interdisciplinary phenomenon teaching and project teaching, and included them in the content of national curriculum reform [2-3]. In order to better carry out interdisciplinary education for college students, guide them to engage in interdisciplinary research and cultivate their comprehensive quality, we must strengthen the cultivation of interdisciplinary comprehensive quality of college students' tutors.

2. Analysis of the Concept of Interdisciplinary Education and Teaching

Interdisciplinary teaching refers to crossing the boundaries between disciplines, establishing the relationship between disciplines on the basis of paying attention to the internal logic of each discipline, and integrating the disciplines, and then implementing the integrated multidisciplinary integration teaching in teaching practice [4]. In the process of phenomenon teaching, starting from a certain phenomenon, multiple disciplines are integrated into the teaching process, so that both teachers and students can find their own positions in the teaching and learning of the course. Different schools and different regions can carry out teaching according to the actual situation in the region. The interdisciplinary education that integrates knowledge process and life perception should first cultivate students' critical thinking ability. Therefore, the critical thinking ability cultivated by interdisciplinary education focuses on students' ability to demarcate knowledge and judge correct knowledge.



Research universities should not only cooperate to solve these interdisciplinary problems, but also make full use of their rich research resources and intellectual resources to teach students the ability to use multidisciplinary knowledge, ask questions, analyze problems and solve problems creatively. Based on the viewpoint of subject integration, this paper holds that "interdisciplinary" is a "chemical reaction" rather than a "physical reaction" [5-6]. Two or more disciplines collide, break up, recombine and merge around the common theme in terms of content and methods, thus creating a new theoretical and research paradigm. "Interdisciplinary" emphasizes the substantive interaction between disciplines after the boundaries of disciplines melt. This process is linked by common problems, rather than random integration without destination or plan.

3. The Main Problems Existing in Interdisciplinary Education and Teaching at Present

3.1. The Interdisciplinary Organizational Structure is not Reasonable Enough

From the ecological point of view, interdisciplinary college education is an ecosystem composed of students, teachers, courses, teaching methods and activities [7]. As shown in Figure 1, students located in the center of interdisciplinary college students' education ecosystem closely interact and interweave with curriculum, teachers, learning communities, activities and other elements.

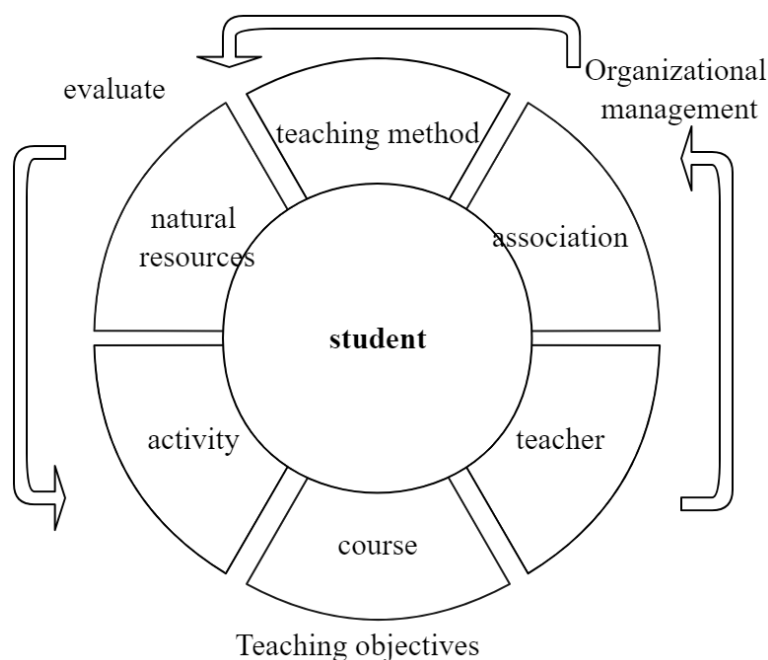


Figure 1. Interdisciplinary college students' educational ecosystem

Traditional courses in China are classified according to subjects, and a complete teaching curriculum system from primary school to university has been formed for many years [8-9]. In traditional education, teachers are highly dependent on textbooks and curriculum standards, and their education level is uneven, so it is difficult to develop interdisciplinary course independently. It is an arduous project from preparing lessons to attending classes. This will inevitably interweave the multiple attributes, tasks and artificial academic division of disciplines. Even in research-oriented universities, there is basically no full-time interdisciplinary research system, which in many cases reflects the traditional education system in which scientific research depends on teaching. This makes the personnel and organizational structure limited to a single discipline and specialty, which is not conducive to interdisciplinary exchanges and cooperation.

3.2. The Orientation of Talent Training Goal is not Clear

With the rapid development of China's construction industry and the increasing degree of internationalization, the market demand for applied and compound engineering management talents

has increased sharply. However, judging from the current situation of offering engineering management majors in universities, although the professional training programs under various colleges are similar, there are great differences in the compulsory courses, limited selection, optional courses and teaching link arrangement. The talent training mode reflects the professional development background of various colleges, and there are some phenomena such as the lack of prominent professional direction and obvious interdisciplinary.

3.3. Lack of Information and Experience

Compared with the traditional teaching mode, interdisciplinary collaborative teaching needs more resources to ensure it. Whether it is the organization of teachers, the matching of teaching hardware, the development of new curriculum content, administrative support, etc., more time and funds are needed. For teachers, to carry out interdisciplinary collaborative teaching needs to learn more about collaborative teaching experience and skills, understand the advantages and disadvantages of different collaborative teaching models and different management and evaluation methods, and learn to cooperate effectively with each other. At present, most teachers don't know where to get this information and experience, and universities don't provide such an information platform.

4. The Path of Interdisciplinary Education and Teaching Reform based on the Cultivation of Comprehensive Quality Talents

4.1. Innovative Interdisciplinary Teaching Design

How should the teaching oriented to knowledge society be designed? How should university teachers in the knowledge society promote and develop the knowledge society in the teaching process, and go beyond the knowledge society, and actively cultivate students' ability to develop learning and cope with changes, so that students can respond quickly and flexibly when facing new economic development opportunities in the future?

In the standardized teaching design, students are regarded as educational products with no difference and individuality. In order to realize the transformation of the training mode of interdisciplinary innovative talents, we must go beyond the fetters of traditional educational ideas, change the paradigm of "receiving education" centered on knowledge transfer, and rebuild from teacher-centered to student-oriented, from knowledge-centered to ability-oriented, so as to realize the value orientation of education from manufacturing.

In interdisciplinary teaching, teachers' choice of teaching contents and methods should be conducive to imparting interdisciplinary knowledge and cultivating critical consciousness and ability. At the same time, teachers can also inspire students to understand and grasp the teaching content from different dimensions and directions. Help students develop meaningful understanding, thus guiding students to actively integrate existing knowledge, enter the unknown field, and transform knowledge into comprehensive ability to solve problems. Enhance students' situational learning ability. When students apply their knowledge to different problem situations, the flexibility of knowledge will also increase. Do a good job in the integration and optimization of curriculum knowledge, and actively explore the contents and methods of interdisciplinary teaching, so that the contents and levels of the curriculum are conducive to students' choice, and the methods are more flexible and diverse, so that students' professional interests and aspirations can adapt to the purpose of personnel training.

4.2. Innovating the Educational Organization Form of Interdisciplinary College Students

Innovating the organizational form of interdisciplinary college students' education is a magic weapon to break through the academic isolated island between disciplines and standardize the interdisciplinary cooperative relationship. Teachers and students of different departments must create new physical space or knowledge space if they seek interdisciplinary cooperation [10]. The existence of a university in the form of an academic community can dispel and change the isolation of a single

scholar, because they are convinced that the growth of knowledge depends only in part on profiting from personal insight. Multidisciplinary organizational system and independence are the advantages of adding educational programs to interdisciplinary research institutions.

At present, China's universities should reposition the college of students, strengthen its educational organization function, and provide preconditions for the college to set up interdisciplinary education programs for students. "Cross-college collaboration" should be an auxiliary way to carry out interdisciplinary college education in China. Universities should fully mobilize the enthusiasm of all departments to cooperate in interdisciplinary education, create an interdisciplinary atmosphere through policy incentives and interdisciplinary academic activities, and help teachers and students gradually establish an interdisciplinary sense of identity and break through the single academic circle. Interdisciplinary training within the college is easier to gain recognition and achieve development under the background of discipline-based training mode, which can weaken the contradiction between them to some extent.

4.3. Strengthen Interdisciplinary Academic Exchanges

The lack of active interdisciplinary academic exchanges directly affects the mutual penetration and integration between disciplines, which is not conducive to the harmony of interdisciplinary organizational structure. Enhance the diversity of academic exchange forms, strengthen the pertinence of academic exchange contents, improve the quality of academic exchange activities, make academic exchange activities more novel and attractive, and thus objectively better mobilize the enthusiasm of tutors to participate in academic exchanges. Education authorities should hold seminars frequently and listen to the suggestions and opinions of in-service teachers. Let teachers play their roles in the design and teaching of interdisciplinary course. Students break through the invisible restrictions between different disciplines, have more active thinking, and can discover the connection between knowledge in different fields in time, further cultivate sentiment and broaden their horizons, which has an important role in promoting the growth of students and the development of the whole country and mankind.

4.4. Reform the Training Mechanism of Interdisciplinary Talents

The key to the cultivation of college students' comprehensive quality is the continuous improvement of creative thinking ability and the continuous innovation of scientific research methods. Interdisciplinary education helps college students to form cross-thinking ability, which is not only the need of interdisciplinary learning, but also the necessary quality for developing and applying interdisciplinary knowledge. It is an important part of creative thinking ability.

First, set up interdisciplinary majors. On the basis of following the law of discipline development and talent training, we should integrate the teaching contents of different disciplines, build a new teaching system, and change the specialty setting mode centered on a single discipline.

Second, the establishment of the interdisciplinary course system. We should increase the proportion of basic subjects. Strengthening the cultivation of basic theoretical knowledge can enable college students to achieve mastery in interdisciplinary research, and when faced with new things, they can not only know why, but also explore why. It can also enable college students to continuously enhance their abilities of updating knowledge, discovering knowledge and creating knowledge.

Third, organize a team of college students' tutors. The cultivation of college students must not be limited to the theory and knowledge of a tutor. Adopting the method of organizing the team of college students' tutors, especially the emerging disciplines and marginal disciplines are jointly guided and cultivated by tutors and teachers of related disciplines, so that students can fully understand and apply all kinds of new knowledge and technologies without being limited to the theory and knowledge of a tutor.

4.5. Improve the Guarantee Mechanism of Interdisciplinary Talent Training

Due to the late start of interdisciplinary research and education in China, coupled with the shackles of the traditional school-running system and the serious impact of the traditional professional education model, interdisciplinary talent training has different degrees of constraints and obstacles in terms of organizational management, institutional mechanisms, team building, policy guarantee, concept system and cultural environment, which directly affects the development process of interdisciplinary education and the final quality of talent training.

Many countries and institutions advocate promoting interdisciplinary research and teaching by breaking the barriers of traditional organizational system of universities. To this end, some traditional branch universities gradually realize the transformation to interdisciplinary universities. At present, the reform of the division system in some universities in China is a good measure to optimize the discipline organization. Universities can combine all kinds of excellent talent training plans, strengthen the optimization and integration of teams, and actively create an academic ecological environment that integrates interdisciplinary teaching and scientific research organically and is open at home and abroad.

Universities must break the original barriers of departments and majors in undergraduate education, reform the existing system of disciplines and majors, and change the traditional professional education from a rigid training model to a more flexible menu-based and customizable autonomous learning model. Establishing a relatively flexible evaluation and incentive mechanism will help to tear down the disciplinary fence of interdisciplinary cooperation. For example, vigorously promote the reform of performance allowance system, change the "identity" management of teachers to "post" management, and vigorously cultivate interdisciplinary teachers.

It can be said that in order to truly implement interdisciplinary talent training, universities must focus on how to reform and innovate the internal management system and system in the integrated design of interdisciplinary scientific research and teaching, and establish effective organization and system guarantee by reforming the internal management system and mechanism that is incompatible with the talent training mode, so as to provide a good environment and conditions for interdisciplinary talent training.

5. Conclusion

Interdisciplinary teaching is helpful to cultivate talents with global competitiveness. In recent years, many countries in the West have been paying attention to interdisciplinary phenomenon teaching and project teaching, and incorporated them into the content of national curriculum reform. In order to better carry out interdisciplinary education for college students, guide them to engage in interdisciplinary research and cultivate their comprehensive quality, we must strengthen the cultivation of interdisciplinary comprehensive quality of college students' tutors. Through various forms of interdisciplinary academic exchange platforms, a strong interdisciplinary learning and research atmosphere is formed, thus promoting the development of interdisciplinary college education.

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