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# Reform and Innovation of Curriculum System of Architecture Specialty Under the Application-Oriented Training Objectives

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**ABSTRACT** The training goal of applied talents is a talent training scheme characterized by emphasizing practical teaching, attaching importance to skilled training and strengthening applied training. In the process of actively practicing the cultivation of applied talents, the architecture major of Kunming University has broken the disadvantages of "heavy theory, many class hours and old curriculum" in the past, and made the corresponding reform and exploration from the construction of the curriculum system. This paper analyzes and summarizes the five aspects of decomposing the ability structure, simplifying the curriculum system, optimizing the curriculum setting, strengthening practical teaching, adding mass entrepreneurship and innovation module, etc., in order to explore the way of the innovative development of the specialty.

#### **1. INTRODUCTION**

Applied education is a kind of educational idea and training mode, which aims at the traditional education and teaching mode, that focuses on strengthening the applied training and paying attention to the practical teaching. In recent years, it has been attached importance to by national and local governments because it meets the needs of social and economic development and talent market. In 2015, the Ministry of Education issued *The Guiding Opinions on guiding the Transformation of some Local undergraduate Colleges and Universities to Application-oriented*[1] which put forward "to determine the transformation and development of a number of pilot colleges and specialties (clusters) to applied technology type higher education". In the same year, Yunnan Province issued *Opinions On the Implementation of the Department of Education of Yunnan Province On Promoting the Transformation and Development of Some Undergraduate Colleges and Universities*. Kunming University, as the first batch of pilot universities and demonstration and practice in the training of applied talents and the reform and innovation.

The key to how to carry out the goal of cultivating applied talents in the process of professional teaching lies in the construction of a professional curriculum system which can reflect the characteristics of application. Through the investigation and discovery, the newly-built local university with Kunming University as an example, because the construction time is not long, the academic foundation is weak, the professional construction is not perfect, specifically, the construction of curriculum system is unreasonable, the subject is complicated, the theory is too heavy, the practice is insufficient, the curriculum is out of date, and the main courses intervene late, the relationship between courses is loose, the teaching content is old and so on, which leads to the unsatisfactory teaching effect, the poor mastery of students' skills and the weak adaptability to employment. Therefore, after defining the goal of applied training, the architecture major of our university has first carried on the thorough research and the reconstruction in the curriculum system setting, conforms to the times development and the policy orientation to carry on the appropriate reform and the innovation to the original curriculum.



# 2. Optimization Principles and Construction Ideas

# 2.1. The Goal Is Definite, The Structure Is Clear.

In the teaching of the undergraduate education oriented with the application of the applied talents, the practice link is undoubtedly the focus of the whole teaching system. The architecture specialty carries on the capability structure analysis under the guidance of the application-oriented training target, and subdivides the general professional competence concept into different capability directions, then relying on the ability structure to locate the professional curriculum, the curriculum system framework with theoretical learning as the guide, practical training as the focus, clear objectives and clear structure is formed.

# 2.2. Put Learning Into Practice And Focus On The Key Points.

Application-oriented type is to take application as the core, to practice as the purpose, to emphasize the application of learning, and to highlight the emphasis. In the curriculum system, there is no greed for entirety, but emphasizing that theoretical courses are sufficient, can be used and useful, practical courses are practical, effective and easy to use. To remove the low-relevance and low-practical courses, to streamline the course subject, to condense the course content, to eliminate the obsolete, to keep the core practical, and to supplement the development front. And the reasonable distribution of credit in the school hours, to the core courses with high correlation degree and strong pertinence, highlight the characteristics of application and reflect the training goal.

#### 2.3. Reduce Theories And Strengthen Practices.

In the traditional undergraduate teaching, the theory is often emphasized and the practice is ignored, the theoretical curriculum arrangement is more, the proportion of class hours and credit is too large, which leads to the gratifying scores in the answer of the test paper, but the students are at a loss as to what to do in the actual practice of the project. In the transformation of education and teaching with the goal of cultivating applied talents, it is necessary to fundamentally change the emphasis of teaching, reduce the theory and improve the practice. From the construction of curriculum system, architecture, on the one hand, moderately reduces the course and credit of theoretical courses, and reduces the depth and difficulty of theoretical teaching. On the other hand, adds practical courses, increases practical hours, improves practical teaching requirements, and highlights the characteristics of applied practice.

#### 2.4. Keep Pace With The Times And Innovate Actively.

The cultivation of applied talents is based on the educational and training ideas of social and economic development and professional market demand in the new period and new form, under this guidance, the construction of curriculum system needs to combine the characteristics of the times, keep pace with the times and actively innovate. On the basis of innovation training mechanism, colleges and universities make clear that innovation should be the main line.[2] [3] After careful analysis of the development of the industry and in-depth investigation of market demand, we have opened up the course module of innovation and entrepreneurship in the course system construction, taking employment as the guide, focusing on practice, offering relevant research methods, subject frontiers, innovative technology, entrepreneurship guidance and other courses for senior students to systematically promote the development of mass entrepreneurship and innovation education and teaching.

#### 3. Reform Measures

# **3.1. Clear Training Objectives And Decomposition Ability Structure.**

The professional competence includes two aspects: core competence and other abilities. According to the orientation of the training goal of architectural talents in our university, the core competence can be divided into four main aspects: the ability of scheme design, the ability of drawing

expression, the ability of computer drawing and the ability of construction design. Other abilities include aesthetic cognition and spatial thinking ability, detailed planning and design ability, construction drawing ability, historical building mapping ability, rapid design and expression ability, teamwork and communication ability and so on. The cultivation of each itemized ability needs the corresponding curriculum teaching link to support, so we bring the curriculum which closely related to the ability goal into the structure of the itemized ability, and ensure that each core competence has more than three main courses as the main training way, so that it can be decomposed layer by layer, implemented one by one, related to each other and supported each other.



Figure 1 Capacity structure analysis chart

#### **3.2.** Adjust The Proportion Of Credits And Streamline The Curriculum.

The past talent cultivation scheme, the theory is heavy, the class is more, the course is old, even if the teacher teaches serious, the students study hard, but often have little effect. In the new program of cultivating applied talents, we have seriously studied and adjusted the credit proportion of professional courses. On the one hand, to reduce the total class hours of the theory course, to strengthen the specific gravity of the practice class. On the other hand, to increase the class hours of the core class and to reduce the less relevant courses.

In order to effectively implement the application-oriented training objectives, the new training program has carried out the bold compression at the total time of the theory course and dropped to 59.4% after careful analysis and repeated demonstration. Conversely, by adding the practice courses and promoting the class hours&credits of the main practice courses and so on, the specific gravity of the practice class is greatly improved, so that it can reach 40% of the total school hours. Finally, not only the core courses of specialty are highlighted, but also the practical training is strengthened. At the same time, the new curriculum system also realizes the reduction of the total class hours, and promotes the development of autonomous learning, thematic communication and extracurricular innovation activities.





Figure 2 Comparison of class hours

# 3.3. Optimize The Opening Time And Concentrate The Content Of The Course.

The professional core curriculum is the main subject in the core position of the curriculum system, and it is the most key support for the cultivation of professional ability. There are many problems in the previous training scheme, such as the delay in the opening of the multiple training course, the unreasonable setting of the credit hour, etc., which leads to the late start of the students' professional study, and the professional foundation is not solid. Therefore, the following four aspects have been moderately adjusted in the new training program, which makes the curriculum structure more clear and the curriculum relationship more scientific and reasonable.[4] Firstly, to take the architectural design specialized ability as the main line, the whole teaching process is divided into three stages, that are specialized foundation, improved design and practice expansion. Secondly, the corresponding professional courses are allocated around the teaching objectives of different stages. Thirdly, the opening term and class hours&credits of some courses are optimized. Fourth, to select the content of intensive courses, to improve the valuable content of the courses, and then to construction of excellent courses.



Figure 3 Major curriculum distribution chart

# 3.4. Strengthen The Teaching Of Practical Training And Improve The Ability Of Practice.

The practice course is an important teaching link which embodies the characteristics of cultivating applied and practical ability in applied undergraduate colleges. Therefore, the new training program focuses on strengthening and improving the practical courses, and sets up practical training courses in different levels around the training objectives. The main purpose of the lower grade is to cultivate



students' spatial thinking and innovative consciousness, the courses are mostly manual work and experiential visits, such as architectural model and construction, architectural and spatial cognition practice, etc.; The middle-grade stage aims to consolidate professional knowledge and improve design competence, most of the courses are in the category of technical training and thematic practice, such as design concentration week, historical building survey and mapping, computer technology upgrading, etc.; In the senior stage, the main teaching purpose is to strengthen skills and expand innovation and entrepreneurship, most of the courses are intensive training and practical practice, such as rapid design and performance, construction drawing design practice, BIM technology application and other targeted and practical courses.

Grade Stage	Practical Teaching Purpose	Curriculum types and characteristics
Junior grade	To cultivate spatial thinking and	Focus on the manual implementation
	innovative consciousness	and experience visits teaching
Middle grade	To solid professional knowledge,	Focus on the technical training and
	improve professional ability.	thematic practice classes
Senior grade	To strengthen skills upgrading,	Focus on the intensive training and
	expand innovation and	practice teaching
	entrepreneurship	

Table 1 Comparison of Practice Teaching at Different Stages

# **3.5.** Add Innovation And Entrepreneurship Module And Connect With The Frontier Hot-Spots.

In accordance with the requirements of the national and local *Opinions on the Implementation of Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities*, the new training program specially sets up the innovation and entrepreneurship course module, which includes two links: theoretical teaching and practical training. It mainly offers innovative courses such as the frontier of relevant subjects and the upgrading of skills for students.

Combined with the development direction and technical frontier of architecture specialty, many practical theoretical courses are offered in the middle and senior grades, such as Architect Vocational Education, Green Building and Development, Assembled Architectural Design and Development, Intelligent Design of Modern Housing... as well as BIM technology application, special research, building energy saving software application and other centralized practical courses. The aim is to show the direction of discipline development, develop new skills and explore new ideas. Through the construction of the curriculum system of innovation and entrepreneurship, it embodies the teaching and training ideas of combining theory with practice, combining foundation with innovation, and combining in-class and extracurricular. The students' positive, initiative and creativity are further stimulated, and the cultivation of the students' innovative spirit, innovation ability and entrepreneurial ability are strengthened.

#### 4. Summary

Under the policy guidance of the application-oriented talents training target, the architectural profession is a highly practical and technical subject, and the talent training program and the construction of the course system also need to be closely related to the pulse of the times, actively explore and innovate. From decomposition the ability structure to position courses accurately, from retrenching course system to optimization course setting, through the outstanding practice teaching to strengthen the application skill, through the addition of the innovation and entrepreneurship module to meet the front of the hot spot, we have carried out a series of research and reform on the construction of the course system, actively practiced and dared to explore on the road of training applied talents. In recent years, the employment rate of professional counterparts has been rising, the innovation and entrepreneurship competitions have repeatedly achieved good results, it can be seen that the relevant teaching reform has achieved some results. Hope to provide reference for the transformation and development of local colleges and universities.



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