Research and Practice on the Practical Teaching System of Architecture Specialty in Local Universities Under the Background of Application-Oriented Talents Training

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Abstract

With the continuous development of China's construction industry, China's demand for architectural professionals is increasing, which also promotes the great development of architectural education. In the practical teaching of architecture major in local universities, there are still some problems: classroom theory cannot be combined with practical courses, teaching mode is too single, teaching lacks flexibility and characteristics, teaching content lags behind, students have few opportunities to practice learning in society and enterprises, and their participation is not high. Through the reform and practice of practical teaching system, the characteristic architecture education of independent colleges is developed to improve the practical and hands-on design ability of architecture students.

Keywords: architecture, discipline competition, studio system, practice teaching

1. Introduction

With the acceleration of China's urbanization process, the comprehensive implementation of architectural design reform, and the emergence of new frontier architectural design concepts, the rapid development of the construction industry in recent years, the construction industry for application-oriented design talent demand is huge, making contemporary colleges and universities face new problems. Different from the "double first-class" and "research-oriented" universities, local application-oriented universities do not pursue the "world first-class", but take undergraduate education as the main body and define the service area and service orientation of the university. Their talent goal is to cultivate senior application-oriented talents with high comprehensive quality and practical ability needed by local industries and enterprises. At the same time, it is urgent to consider how to reform the university education under the background of theoretical teaching.

Architecture itself is an engineering major with strong practicality. Architects need to have "the coherence of thought and operation, the integration of academic theory and engineering method, and the conjugate of knowledge and skills" (Zhuang, W.-M., 2015). There is a certain gap between architecture major in local universities and ordinary universities in terms of school background, supporting conditions and students, and the gap between architecture major in local universities and old eight universities is even greater. For example, classroom theory cannot be combined with practical courses, teaching mode is too single, lacks flexibility and characteristics, teaching content lags behind, and cannot represent the cutting-edge level of this major. Students have few opportunities to practice learning in society and enterprises, and their participation is not high. So, local

colleges and universities must be innovative teaching ideas, optimizing the teaching content, combined with their own characteristics, the talent cultivating target setting clear, clear, culture has strong adaptability, strong practical skills and the adaptability and the ability of engineering technology applied talents, from classroom to practice, stride forward one step at a higher education level, Form a unique teaching characteristic of undergraduate architecture specialty.

Practice is the only criterion to test the truth. Architectural education is also inseparable from engineering practice, in which architectural thinking can be formed and architectural engineering experience accumulated (Wang, J., 2018). In college education and teaching, practical teaching is an important part of the education process from knowledge to ability, which is of great significance to realize the goal of application-oriented college talent training. Practical teaching is the key content to improve the classroom teaching effect and an important channel for students to acquire and master practical skills.

2. Current Situation of Architectural Practice Teaching in Local Colleges and Universities

The teaching mode of architecture in local universities in China is to learn the teaching mode of the old eight universities of architecture. The teaching of the old eight universities of architecture not only attaches great importance to the construction of practical teaching system, but also has its own characteristics of practical teaching. However, the teaching mode of the old eight architectural schools is research-oriented and elite, which is not suitable for the educational philosophy, teaching conditions and student characteristics of local colleges and universities (Zhu, G.-X., 2015).

Teaching in local colleges and universities often relies on teachers and classrooms, with teachers' explanation and q&A as the main body, and the classroom as the main battlefield for students, who complete course assignments by consulting norms and learning cases. While architecture is a four-dimensional object, it has a three-dimensional entity, which will change with time and times and produce new content. In addition, there is the problem of fixed design task book. With the development of The Times, great changes have taken place in China's modern architecture, both in terms of content and form. The traditional fixed task book and fixed design content can no longer meet the rapid development of architectural form and content. Under the premise of fixed assignment books, students will lack of exploration and thinking about this type of buildings, believing that all the contents of this type of buildings are the same.

In the context of the global integration of architectural design market demand and the rapid development of Chinese economy, this paper takes local universities as the research object and aims to cultivate applied talents in line with market demand, analyzes that the practical teaching of architecture major in local universities should not blindly imitate the teaching mode of ordinary universities and the old eight universities. In the construction of practical teaching system for architecture major in applied universities, we should combine the development orientation of applied universities in China to build a practical teaching system centering on practical ability cultivation and aiming at ability improvement. However, there are still many teaching problems that need to be improved in the development process of architecture in many local universities, such as short establishment time, insufficient specialty characteristics, immature specialty training mode, aging curriculum system, insufficient off-campus practice, teaching mode 1, outdated assessment and evaluation methods, etc. In order to deepen the research of practical teaching system and promote the development of "characteristic" discipline, the development of architecture specialty in local universities should have its own characteristics.

3. Strategies for Constructing Practical Teaching System

Through the research on the practical teaching system of architecture specialty in local colleges and universities based on the applied education mode, the practical problems such as the change of architectural talent demand and the lack of practical ability are analyzed and solved (Tian, B., Wu, Y.-J., & Sun, B., 2018). The author puts forward four strategies: constructing the practical teaching curriculum system of "three lines advancing together, strengthening the two cores", constructing the practical teaching guarantee system, constructing the practical teaching platform system with application-oriented characteristics, and constructing the practical teaching evaluation and supervision system. It provides an effective way to cultivate the practical ability of students majoring in architecture in local universities. And in each stage to establish the practice teaching module that is compatible with the ability training, establish the association, cross and progressive relationship between each module, and then connect the practice module of different stages into a hierarchical system, so that students in practice gradually cultivate various practical ability gradually improve (Qu, X.-Y., & Liu, Z.-H., 2018).

3.1 To Build a Practical Teaching Curriculum System of "Three Lines of Common Progress, Strengthening the Two Cores"

In view of the current situation that the teaching curriculum system of architecture major in local colleges and universities unilaterally emphasizes the development role of the curriculum for the discipline and emphasizes comprehensive, rigorous and self-established system, which results in the division of practical teaching, the lack of systematization and comprehensiveness, and the low learning efficiency and poor practical ability, innovation ability and comprehensive ability of students, Based on the applied education model, a practical teaching system of "three lines of common progress and two cores of strengthening" was constructed in local university architecture (Qiu, D.-H., 2011). Traditional practice teaching courses tend to neglect the cultivation of knowledge and ability of diversified technical talents of service management. In the "three lines" is according to the express self-cultivation practice, professional design, construction technology practice three modules to build the basis of the practical course system platform, each line practice exercise different practice ability of students, from simple to complex, from basic to the comprehensive transformation, and in the practice of grade one to grade four continues to well versed in the curriculum system.

Cultivation practice system mainly includes architectural model making, watercolor sketching, etc., which mainly trains students' hand-drawing ability, hands-on ability and software application ability. In practice, the introduction of the informationization teaching concept, promote the practice teaching of colleges and universities, by visiting various practical cases, cultivate students' ability of perceptual knowledge, let the students get a sense building interior space and the combination of the architectural form, to have a system comprehensive understanding of my major, at the same time of eye-opening, also provide case experience for future design.

The professional design practice system mainly includes architectural cognition practice and architectural design course design series. This course mainly cultivates students' design practice ability, expands students' design types and improves students' design breadth. It within a certain space on the one hand, focusing on the selection of historic buildings, such as ancient city, the big ruins cultural heritage and to represent the content of the regional culture ethos, such as traditional customs, aesthetic taste, and with the type of building, basic elements, space, streamline and environmental elements such as the scene teaching, the combination of guide students to focus on specific people patterns of behavior and thought patterns, As well as in the concrete production, life style and cultural activities.

The practice system of architectural technology mainly includes ancient architecture surveying and survey, site practice, etc., to expand students' knowledge of architectural technology. Cultivate students' perception of architecture and life, enrich students' thinking and cognition of traditional culture, strengthen students' spiritual construction, and enrich the connotation of students' design works.

In each module of the course and according to the basic skills, special skills two levels to design. "Strengthening the two cores" refers to strengthening the two core practice courses of graduation design and architect business practice, which is a comprehensive and professional training based on the basic platform. Such practical teaching system strives to achieve the unification of theory and practice in terms of curriculum structure, and strives to achieve the unification of students, disciplines and society in terms of innovation ability training.

It is expected to build a practical teaching system of "three lines of common progress and strengthening two cores", which is currently being practiced and verified to ensure that the practical teaching system of "three lines of common progress and strengthening two cores" is in line with the teaching of architecture major in local universities under the background of application-oriented talents cultivation.

3.2 Build a Practical Teaching Platform System With Application-Oriented Characteristics

The construction of practical building platform is an important guarantee to ensure the quality of practical teaching. Local colleges and universities should build practical teaching platform with application characteristics according to their own characteristics, which mainly includes three aspects: laboratory, studio, practice and training base and platform. Ensure the construction of three platforms: basic platform, expansion platform and comprehensive platform.

3.2.1 Architecture Laboratory Construction - Basic Platform

The teaching of architecture major is different from other majors. Architecture major has very high requirements for practical ability. At the same time, the types of architecture courses are rich, including architectural design series courses, architectural knowledge theory courses, art painting courses, architectural technology courses, architectural practice courses, etc. There are many building facilities that lead to architectural requirements, including professional drawing rooms, drawing rooms, model making experiments, machine rooms, surveying,

building physical experimental conditions, and photographic equipment. In recent three years, our department has built a new building model laboratory, professional drawing room, VR simulation laboratory and other teaching facilities. Our department has basically met the teaching needs of architecture, but the architectural physics experiment needs to be completed by the physics experiment of the department, and the number of professional classrooms is still insufficient. The above deficiencies in general, that is, the use of the laboratory to strengthen.

3.2.2 Characteristic "Open" Studio Teaching Platform - Development Platform

After five years of efforts, our department has formed the "studio teaching" mode. Next, we need to integrate the studio teaching mode to make its application more flexible and better integrate it into the practical teaching system.

At the same time, the study of architecture requires not only in-class learning, but also a lot of time to study and practice design after class, so as to improve students' ability of design practice and innovation. The school has been committed to cultivating application-oriented talents. The architectural design "studio" is systematically constructed and integrated into practical teaching. The architecture major of the College initially formed the "studio" mode of architectural design in 2016, and gradually improved the "studio" mode in 2019.From reasonable "virtual studio" echelon system build architecture design, architecture design competition of "virtual studio" project practice system, architectural design "virtual studio" learning communication system, the architectural design of "virtual studio system" management system four aspects, so as to improve the students' learning enthusiasm, through a lot of course contests, exercise scientific research project, Improving students' design practice ability is in line with the college's strategy of cultivating applied talents (Tian, C.-X., 2019).

The practice teaching of architecture major in local colleges and universities needs to develop its own characteristics, and the teaching platform of characteristic "studio" has been preliminarily formed in architecture major, which enables students to improve their practice and innovation ability and has achieved good results.

3.2.3 Practice Base and Platform -- Comprehensive Platform

Practice base construction is an important part of higher education teaching work, is to improve the teaching quality in colleges and universities, ensure the quality of practice teaching link, also is one of the basic conditions for cultivating applied talents, build a continuous interaction, the progressive level of the "three platforms" characterization practical training system, based on the characteristics of different grade professional practice course, The construction of practical teaching base is the guarantee of constructing three platforms: basic platform, expanding platform and comprehensive platform (Liu, Y.-J., Lu, F., & Deng, S.-Y., 2013).

3.3 Construct a Teaching Guarantee System for Practical Teaching

The construction of practical teaching guarantee system mainly includes three negative aspects: teaching method, teaching means and teaching technology.

For local colleges, the shortcomings of teachers, teaching conditions are relatively backward, the students' learning initiative is relatively poor, local colleges and universities teaching, often rely on the teachers and the classroom, teachers explain and answer questions as the main body, with the main classroom for students, students access to specification, case study, complete course assignments.

We need scientific teaching methods, teaching means and teaching techniques. And through practice and demonstration to improve the existing practice is not strong, the lack of practical content in the teaching process. It is impossible to guide and teach according to the characteristics of local college students, which hinders the formation and development of application-oriented talents training characteristics.

3.4 To Build a Practical Teaching Evaluation and Supervision System

The construction of practical teaching evaluation and supervision system mainly includes three aspects: student evaluation and supervision system, teacher evaluation and supervision system and social response.

3.4.1 Student Evaluation and Supervision System

The establishment of student evaluation and supervision system mainly includes design portfolio, design competition and scientific research. The following research needs to build a quantitative table of student evaluation and supervision system to determine the scientific integrity of the evaluation mechanism of students' practical ability.

3.4.2 Teacher Evaluation and Supervision System

Build teacher evaluation and supervision system mainly includes the design practice, the teaching achievements of scientific research from several aspects, such as strengthening practice teaching for the construction of teaching staff, build a can take both to theory teaching and practice teaching team, teaching team improvement and improve

the practical teaching system construction and implementation of the important guarantee. Teachers are invited to participate in practical design projects in enterprises, so as to improve the quality of practical teaching of architecture specialty and build a "double-qualified" teaching staff for practical teaching

3.4.3 Social Repercussions

The establishment of social response evaluation system mainly includes analysis of students' employment situation, evaluation of school-enterprise cooperation practice and training, and social influence. The following research needs to build a quantitative table of social response evaluation system to ensure the real, effective and objective data analysis.

4. Verification of the Effectiveness of Building Practical Teaching System for Architecture Major in Our College

Through constructing the practical teaching curriculum system of "three lines advancing together, strengthening the two cores", constructing the practical teaching guarantee system, constructing the practical teaching platform system with application-oriented characteristics, and constructing the practical teaching evaluation and supervision system, The effectiveness of practical teaching system is verified from three aspects: practical ability of design competition, comprehensive practical ability of overseas study entrance examination and comprehensive practical ability of employment feedback.

Through the data analysis of the 2012-2018 architecture students in the School of Arts and Science, Yangtze University, the research is of great help to the improvement of the practical application ability and innovation ability of architecture students.

4.1 Analysis of Practical Ability of Design Competition

Discipline competition is an important embodiment of professional quality in architecture. It can not only reflect students' hand-drawn design ability, but also their software application level, as well as a comprehensive expression of design ability. And the result of the discipline competition is also an important reflection of the practical ability of the class.

Since 2015, our college has won more than 60 national and provincial competitions and nearly 180 awards for architecture students.

4.2 Analysis of Comprehensive Practical Ability of Overseas Postgraduate Entrance Examination

The postgraduate entrance examination and study abroad in architecture are different from other majors. In addition to the preliminary examination, the second examination is very important. The second examination and study abroad have high requirements on the collection of design works and comprehensive practical ability, which are also important embodiment of the comprehensive practical ability of architecture major.

From 2013 to 2015, it can be seen that our department took the 12th grade (two students from 12th grade were admitted as postgraduate students in the Second World War) and the 13th grade (7 students from 14th grade were admitted in the one-time entrance examination, and 1 student from the second world War entrance examination (8 students from 14th grade were admitted in the entrance examination). Students have received admission offers from The University of Sydney and the University of Melbourne for graduate studies in Architecture. Yang Lu, a student of grade 14, was admitted to Zhengzhou University (double first-class university).

Liu Yang from Grade 15 was admitted to Zhengzhou University and ranked first in the total score of the preliminary reexamination. Xiao Shu from Grade 15 was admitted to UCL (QS World Ranking Second in Architecture), which fully reflects the comprehensive practical ability of students majoring in architecture.

It can be found from the graduate school entrance rate of students from 2012 to 2015 that the graduate school entrance rate of students from 2014 is up to 14.3%, and the proportion of first-class universities is also increasing year by year.

4.3 Analysis of Comprehensive Practical Ability of Employment Feedback

The employment situation of architecture graduates can better reflect their practical ability of applied architecture talents. Based on the first-year employment situation of 2012-2015 graduates of our department, we analyzed the comprehensive ability of students' employment feedback of our department from the aspects of the proportion of students engaged in architectural design, the proportion of students working in first-class design institutes and school-enterprise cooperative units. (Table 1)

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4.3.1 Proportion of Engaged in Architectural Design

Table 1. Employment data of design institutes for graduates from 2012 to 2015

grade	The total number of	Number of students not attending school	The number of the second world war	Number of persons engaged in architectural design	Percentage engaged in architectural design	Engaged in first-class design institute	Ratio of first-class design institutes to non-graduate students
2012	97	95	2	10	**10.5%**	**3**	**3.2%**
2013	84	81	0	**12**	**14.8%**	**6**	**7.4%**
2014	56	48	0	36	**75%**	**17**	**35%**
2015	31	17	4	15	**88%**	**9**	**52%**

Chart source: self-drawn

Important indicators. According to the employment information attachment of 2012-2015 graduates, the proportion of graduates engaged in architectural design after graduation has increased significantly (Figure 2). By the time they started to work in grade 14, the proportion of graduates engaged in architectural design reached 75%, and that of graduates from grade 15 reached 88%.This fully reflects the practical ability of architecture major in my department.
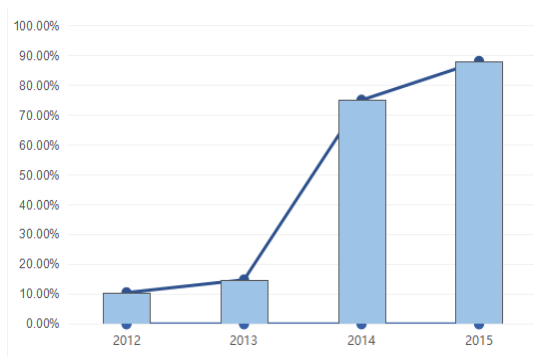

Figure 1. Proportion of graduates from Grade 12 to 2015 engaged in architectural design
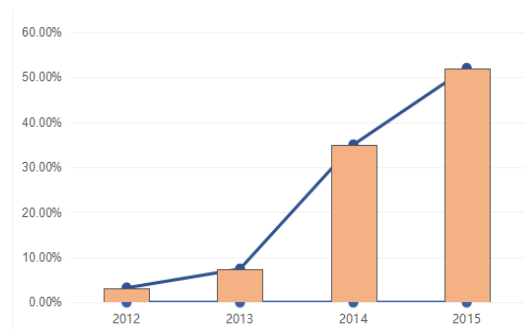

Figure 2. Proportion of graduates from Grade 12 to 2015 engaged in first-class design institutes

Chart source: self-drawn chart source: self-drawn

4.3.2 Proportion of First-Class Design Institutes

Students from grade 14 and 15 of our department work in national key first-class design institutions such as Tianhua, One Innovation International, Hope Architecture, Hubei Provincial Architectural Research and Design Institute. The proportion of employed graduates working in architectural design in first-class design institutes increased from 3.2% at grade 12 to 52% (See Figure 3).

4.3.3 School-Enterprise Cooperation Units Are Satisfied With Students in Our Department

Through the feedback of employment cooperation units and part of the feedback of employment, the graduates of architecture major in my department have received good feedback on employment. The architectural talents in my department have been well received by youan International, Senlei International and other first-line design institutes. Some outstanding graduates play an important role in making design decisions in project design.

At present, there are problems in independent colleges: classroom theory cannot be combined with practical courses, teaching mode is too single, teaching lacks flexibility and characteristics, teaching content lags behind, students have few opportunities to practice learning in society and enterprises, and their participation is not high.

Through the practice of architecture teaching system, students in our college have achieved significant improvement in professional quality and ability. Through comparative observation, students also showed a more holistic view of architectural design after the educational reform, with higher design depth and feasibility, and significantly improved quality of design results. At the same time, in discipline competitions, our students have become more active in recent years and have achieved excellent results in various competitions. In terms of college entrance examination, the rate of postgraduate entrance examination has been steadily increasing, and many students have been admitted to ideal graduate schools through their own efforts. Among them, the enrollment rate of double first-class universities and overseas famous universities has increased significantly. In the work, we learned from the feedback that the work consciousness and practical ability of our graduates have been significantly improved, as well as their work ability and innovation ability.

5. Subtotal

Department of architecture through the practice of practical teaching system, not only strengthen the supplement professional learning in the class, also strengthen students learning ability, but also makes the curriculum, the combination of theory and practice of classroom teaching type diversity, to enhance the flexibility and characteristic, make students have more opportunity to toward the society, higher recognition. At the same time, the cultivation of students' practical consciousness, methods and ability should be strengthened, and the practical teaching system of architecture should be established through systematic research, so that students' practical ability can be significantly improved.

Through the implementation of the architecture practice teaching system, the learning atmosphere of architecture major in our college is improved, the practical design ability of students is strengthened, and the professional quality of students is cultivated. So that our students can better connect with social enterprises, better adapt to the social environment and development needs.

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