Localization Strategy of Co-op Education Concept in Architecture Major of Local Colleges and Universities

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Abstract. Architecture majors in local colleges and universities focus on the training of applied talents. Facing the opportunities that the State encourage the application transformation of local undergraduate universities and the construction of new engineering courses, Co-op Education, which is famous for the cultivation of talents' practical ability, may provide reference for Architecture major. This paper discusses the localization strategy of Co-op Education for Architecture major from three aspects which are consciousness transformation, action plan, and evaluation mechanism.

Keywords: Architecture major · Local colleges and universities · Localization of Co-op education · Strategy

1 Introduction

During the 14th Five Year Plan period, China's higher education entered a new development stage of popularization.The situation of international competition and the trend of domestic development have put forward new requirements for higher education. At present, on the one hand, the state actively promotes the classified development of higher education and encourages local undergraduate institutions to transform to application-oriented, [1] on the other hand, it promotes the construction of new engineering for engineering education [2]. Compared with the traditional one, the new engineering is an innovation in specialty setting, training program and knowledge system reconstruction. Architecture major in local universities is not only an applied discipline in applied universities, but also a traditional engineering discipline. The above two concepts provide a direction for the reform of undergraduate talent training in Architecture. It is worth thinking about how to seize the development opportunities and explore a path suitable for their own characteristics.

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Table 1. Credit distribution of Architecture major in Wuhan Polytechnic University

Edition① Item	2005		2010		2015		2020		2022	
	Credit	Percentage (%)	Credit	Percentage (%)	Credit	Percentage (%)	Credit	Percentage (%)	Credit	Percentage (%)
Classroom teaching	202.5	72.4	181	71.5	178	73.3	167	72.6	150	78.9
Practical teaching	62.5	27.6	72	28.5	65	26.7	63	27.4	40	26.7
Total	265	100	253	100	243	100	230	100	190	100

2 Development Dilemma of the Training of Architectural Professionals in Local Colleges and Universities

2.1 Contradiction Between Talent Training Program and Goal

Talent training is a systematic project, in which the training program determines curriculum system and curriculum distribution. Generally speaking, the training program should be guided by the goal, which is the output of the former. For Architecture majors in local colleges and universities with the goal of cultivating applied talents, the training program should focus on cultivating students' practical ability. However, the program still shows the traditional characteristics of emphasizing theory over practice. The proportion of class hours in the curriculum system is seriously biased towards theoretical courses [3, 4], and the proportion of practical courses have not been significantly improved. Taking the Architecture major of Wuhan Polytechnic University as an example, in the past two decades, the proportion of practice has always been about 27% (Table 1), and has not increased due to the adjustment of goal.

In addition, the content of practice courses has been adjusted several times, but they are still mainly in school, short-term, and teachers' responsibility. Internships in employers (called Design Institute internship and Production internship) account for only about 30% of the centralized practice credits (Table 2). And with the reform trend of continuous compression of total credits and total class hours [3, 4], this practice link shows the same compression trend (the column of *number of weeks* in Table 2).

2.2 Deficiencies in the Current Situation of Talent Training System

Many local colleges and universities have school-enterprise cooperation projects, but from a macro point of view, the mode of school-enterprise cooperation in talent training has not been fully established, which is still a weak link [5]. In addition, the construction of teachers' team is also inadequate for the cultivation of talents' practical ability, because colleges and universities pay more attention to teachers' scientific research ability rather than engineering practical experience. For example, the introduction of teachers is often measured by academic qualifications and academic achievements, and the publication of scientific research papers (especially SCI papers) is regarded as the main condition for the recruitment of young teachers [3]· In this way, young teachers are mostly doctors who lack engineering practical experience and do not have the ability to guide practice.

Table 2. Proportion of Engineering Practice Credits of Architecture major in Wuhan Polytechnic University

Item Edition	Design Institute internship, Production internship		Centralized practical teaching	Percentage (%)
	Number of weeks	Credit	Total credits	
2005	21	21 (18 + 3) ①	62.5	33.6%
2010	21	21 (18 + 3)	69	30.4%
2015	19 (16② + 3)	11 (8③ + 3)	50	22.0%
2020	14	14 (12 + 2)	48	29.2%
2022	12	12	40	30%

Notes 1. ① 21: sum of credits for Design Institute internship and Production internship
18: credits of Design Institute internship;
3: credits of Production internship,
2. ② ③ the 2-week duration of this edition is 1 credit

Table 3. Study/Work Sequence of Architecture [7]

Year	First			Second			Tihrd			Forth			Fifth		
Term	F	W	S	F	W	S	F	W	S	F	W	S	F	W	S
	A	B	off	A	※	B	※	A	※	B	※	※	A	※	B

Notes: 1) F- Fall, W-Winter, S- Spring. 2) A, B: Academic term. 3)※: Work terms in which students need to choose employers, take part in real work, and get a certain salary. 4) Off: Denotes a term in which students are not registered at University for classes and are not on a co-op work term

3 Co-op Education and the Advantages in Talent Training

Co-operation Education, as an important mode of training engineering professionals, has won world acclaim for the outstanding achievements of the University of Waterloo. The core is to combine theoretical study in the college with real work practice to cultivate talents needed by employers.[6] The concept is to let enterprises deeply participate in the running of universities, and make full use of the resources of universities and society to cultivate talents. The success of the model can be proved by the imitation by more than 40 countries. Taking the Architecture major of University of Waterloo as an example, Co-op program takes about 5 academic years. Each academic year has three terms, with four months per semester. Each term is either academic term or work term. Usually, academic terms alternate with work terms, which form study/work sequences.

It can be seen from Table 3 that Architecture students who participated in the Co-op program actually worked for 24 months (i.e. 6 semesters) and practiced about 6 different positions when they graduated. They have rich practical experience and are welcomed by employers.

4 Localization Strategy of Co-op Education Concept

4.1 Field of Consciousness: Change the Concept of Leaders and Teaching Managers

The reform of talent training mode is not only related to majors, but also an action that needs the recognition and support of universities. Therefore, leaders and teaching managers who directly formulate rules need to recognize the advantages of Co-op education and the necessity of its implementation. The reform will inevitably involve many changes in work which certainly cause many troubles at the beginning. Only by changing their ideas, can these managers use their positions to actively promote reform and solve problems.

4.2 Action Plan

4.2.1 Formulate an Appropriate Training Program

The current undergraduate status of Architecture major is required 5 years, and there is no need to increase time when applying the Co-op mode. At the same time, the continuous compression of total class hours and credits means that the total length of students' studying in classroom is reduced. The training program could make full use of this to create conditions for students to participate in more practice. In terms of curriculum allocation and class hour distribution, appropriately concentrate classroom learning, and arrange practice links near the summer vacation. In this way, students could continue to work during the vacation, which is equivalent to extending the practice time without increasing credits. Specifically, in the first and second grades, the program could increase the proportion of credits in campus and do not arrange work practice due to the emphasis on basic education. In the third to fifth grades, the proportion of work practice could be increased for students could complete the professional tasks proposed by the enterprise.

4.2.2 Strengthen the Guidance and Evaluation of Practical Links

It is necessary to strengthen the guidance and evaluation of students' participation in work. Guidance is mainly embodied in psychological and professional guidance, which runs through the internship, but focuses on different stages. The evaluation is mainly reflected after the internship. The main undertakers of this work are architectural teachers and employer engineers. Professional teachers, rather than full-time personnel, participate in it, which is conducive for teachers to understand the whole process of students' practice, so as to put forward targeted professional guidance.

4.2.3 Establish Practical Feedback Mechanism

Practice feedback, including students' evaluation of employers and employers' evaluation of students [8], is an important part of Co-op education. It could be started with the establishment of regular surveys and assessments consisting of routine surveys and large-scale surveys. Routine research is conducted once a year, and large-scale research is every three to five years. Routine research is mainly aimed at the students and employers involved in the internship that year; Large-scale research is mainly aimed at graduates

who have worked for two years. With short-term to long-term follow-up research, we could adjust and optimize teaching and practice accordingly.

4.3 Evaluation Orientation: Pay Attention to the Cultivation of Applied Talents

The evaluation mechanism of paying attention to the cultivation of applied talents mainly involves teachers and students. Teachers should be encouraged to participate in engineering projects. For example, the evaluation system treats engineering projects and academic research equally. On the other hand, we should affirm teachers' work in guiding students' practice, and give different rewards or separate salaries. It should not be considered as a job that teachers should do or irrelevant. For students, they are also encouraged to participate in the engineering projects presided over by teachers. According to the degree of participation, corresponding credits or alternative innovation and entrepreneurship courses are given.

5 Conclusion

Co-op education is consistent with the original intention of building new engineering and the talent training approach of advocating collaborative education between colleges and enterprises in China, and also conforms to the direction of talent training in applied local colleges and universities. It is of great significance to explore Co-op education suitable for Architecture majors. It could be started by changing the concepts of leaders and managers, taking action from formulating appropriate talent training programs, strengthening the guidance and evaluation of practical links, establishing a practical feedback mechanism, and building an evaluation system that attaches importance to the cultivation of applied talents.

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