

Exploration and Practice on the Construction of Campus Training Base for Architectural Design Majors

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Keywords: architectural design major, training base construction, industry transformation and upgrading

Abstract: Based on the modernization, the intelligentization and the transformation and upgrading of the architecture industry, there are new requirements for the cultivation of real estate architectural design talents. It is necessary to train new type of technical personnel that can meet the needs of the market and meet the requirements of the jobs. The research is devoted to exploring the feasibility of building a relatively comprehensive training base with self-contained system for architectural design majors, and proposes a construction plan that can be implemented. It proposes suggestions for other universities and colleges in laboratory construction to integrate the industry, laboratory construction steps and processes. This research summarizes the process of laboratory construction, that is, “investigation → project set-up → demonstration → integration → re-demonstration → construction”, which improves equipment utilization and avoids duplication of investment. At the same time, it can keep up with the requirements of industry transformation and upgrading, and avoid the backwardness of laboratory construction.

1. Introduction

According to the National 13th Five-Year Development Program and the National New Urbanization Plan (2014-2020) and the development needs of building a well-off society in an all-round way, with the improvement of people's living standards, China's urbanization process will continue to advance. Either the construction of the urban and rural integration, or the improvement of the home environment, the construction industry plays an extremely important role. Being the source of the construction industry, architectural design and architectural interior design and other architectural design majors will play an important role in cultivating talents in the architectural design, urban and rural planning, residential area planning, interior design, etc.^[1, 2].

In addition, under the construction guidelines of “applicable, economic, green, and beautiful”, the state will focus on the development of prefabricated buildings, smart buildings and sponge cities, which will accelerate the informationization, modernization, and industrialization of the construction industry. Therefore, the comprehensive implementation of building informatization, namely BIM technology, in the architectural design stage is one of the effective ways to achieve fine management of construction projects and intensive management of enterprises. At the same time, by 2025, the proportion of prefabricated buildings in new buildings will reach to 30%, and the gaps in applied technical and technical talents that use BIM technology for professional design of fabricated buildings are huge^[3].

As the only municipality directly under the central government in Chongqing, in the context of the transformation and upgrading of the construction industry and the modernization of the construction industry, it is urgent to acquire a large number of talents with high-quality applied technical skills and strong practical abilities, mastering modern architecture (wisdom, green) concept, new architectural design (assembly-integrated architectural design) and construction drawing design, construction information technology (BIM and VR) application and on-site management technology.

In order to cultivate practical and skilled talents that meet market demands and meet job requirements, we should not only reform the curriculum system and teaching content, but also highlight the curriculum standards for vocational ability training and standardize the basic

requirements for curriculum teaching, improve the quality of course teaching. In addition, we should also reform teaching methods and means, and integrate “teaching, learning and doing” to strengthen the cultivation of students’ abilities.

In order to meet the training mode of “teaching, learning and doing”, it is necessary to have a training room that meets the needs of the curriculum, adapts to market needs, and has professional equipment. Only by building an on-campus training base that adapts to the development of the industry, can we provide conditions for cultivating specialized talents that meet the social needs and job requirements.

2. Research Processes

2.1 Research objects and purposes

At present, the lack of educational resources in the southwest region has led to the relatively lagging construction of the industry training center. In particular, there is no mature experience in the specific operation of laboratory construction for architectural design. In order to make up for the shortcomings of regional education and training, we explore the feasibility of building a self-contained and relatively reliable comprehensive design base for architectural design, and propose a plan that can be implemented to provide blueprints for other universities and for industry skill training. At the same time, it also provides reference for how the laboratory construction of similar universities closely follows the development of the industry, the steps of professional laboratory construction and the specific construction process.

Therefore, the research object is the construction of training base suitable for the teaching of architectural design in the new era. And it combines with the status quo of vocational education, meets the requirements of the practicality of vocational education, and builds a new training base that can continue to develop with the needs of the industry. At the same time, it is closely linked with the development of the industry, attracting the joint construction of high-quality resources of the society, and building a professional training base for architectural design that attracts students and service industries, so as to form an industry-leading base that meets the needs of skilled personnel training and industry skill training.

2.2 Core issues

(1) With the new round of the modernization, the intelligence and the transformation and upgrading of the construction industry, the need for new construction talents must be cultivated to meet the needs of the market and meet the requirements of the jobs. In the process of teaching reform that integrates “teaching, learning and doing”, which laboratories need to be built specifically?

(2) The task of colleges and universities is to focus on teaching and be responsible for cultivating talents for the society. The training base is mainly used as a teaching and research site. How to plan the scale of the construction laboratory, the number of instruments and equipment together with the teaching unit of the whole school to avoid the situation of repeated construction and low equipment utilization?

(3) With the training requirements of new construction talents, how can we build a laboratory that meets the needs of new talent training and keep the training room equipment updated with the development plan of the industry to avoid the problems of poor construction and excessive investment in equipment maintenance?

2.3 Research methods

(1) Literature research: The researcher collected research materials on the status quo, reform background and methods of the construction of vocational training bases for higher vocational buildings through the library and the Internet.

(2) Investigation in other institutions: The researcher conducted on-the-spot investigations on professional design laboratory of excellent universities, took the strengths of others and made up

shortcomings, so as to avoid redundant construction.

(3) Enterprise and industry investigation: The researcher investigated the actual capacity needs of the relevant enterprises and industries for the employer's employability and clarified the graduates' social employment level, so as to accurately position the talent training objectives and promote the construction of the training base.

(4) Expert argumentation: The expert argumentation was conducted in the research results and the implementation of the training base formed by the discussion of the construction members. The institutions and industry experts participated in the expert argumentation.



Fig.1 Enterprise investigation and expert argumentation

3. Construction Practice

(1) Through research and construction, the BIM experimental training center represented by BIM and 3D printing training room was expanded, and the hardware configuration and software version were upgraded, which helps the architectural design students to better study the “BIM Technology”, “Building Model”, “Composition”, “Architectural Design” and “Construction Drawing Design” and other professional courses and provides internship training conditions for the modernization of building information. The completed training room also provides a modern training course base for the students majoring in building engineering technology, engineering cost and environmental art, avoiding the vacancy rate or low utilization rate occurred in some teaching and experimental equipment in colleges and universities.

(2) Through research and construction, a new building acoustics laboratory represented by architectural thermals, architectural optics and architectural acoustics was built, which helps the architectural design students to better study the “Building Physics and Equipment”, “Building Materials”, “Building Structure”, “Interior Design” and “Architectural Design” and other professional courses, provides practical training conditions for building energy conservation and green building design and provides testing equipment to originally reduce building energy consumption. The completed laboratory can also serve related majors such as architectural decoration engineering technology, construction engineering technology, environmental art and equipment engineering.

(3) To combine the resources of the whole school and avoid redundant construction, other “Building Characteristic Structure and Modeling Experimental Base” will not be built. The relevant professional experimental training room of the project will be integrated into the new building structure laboratory of the construction engineering department and the woodworking training ground of the construction engineering training base of the construction engineering. It provides conditions for students majoring in architectural design to study the professional courses of “Building Structure”, “Composition”, “Building Model” and “Architectural Design”. While meeting the needs of talent development, it also saves investment and experimental sites and avoids waste.



Fig.2 Architectural Optics Training Room and BIM Experimental Training Center

4. Conclusions

Due to the modernization, the intelligentization and the transformation and upgrading of the construction industry, there are new requirements for talent cultivation. In the construction of the training room, we should not only pay attention to the construction of traditional building physics (building acoustics, architectural thermals, architectural optics), architectural art (color, sketches), architectural models, building energy conservation, building construction and architectural design, etc., but also pay attention to industry dynamics, build assembly-type building structures, BIM technology, 3D printers and VR technology and some other training rooms.

Taking the laboratory construction process of Chongqing Real Estate College as an example, the laboratory construction has undergone “investigation (the industry, enterprises, other universities and colleges) → project set-up (writing research report, project application) → demonstration (the construction necessity, feasibility and advancement) → integration (the laboratory integration of the whole school, combined with repeated construction of laboratories and equipment) → re-demonstration (the possibility of combined construction of the site or equipment sharing and the size of the site, the number of equipment sets) → construction (determining the competent units and participating units responsible for construction, bidding and procurement, construction and implementation).

The construction process of “investigation → project set-up → demonstration → integration → re-demonstration → construction” has the following advantages:

(1) To improve equipment utilization and avoid double investment.

Taking the architectural design profession as an example, the building model training room and the construction engineering workplace training base of Department of Construction Engineering are merged; the building energy conservation training room and the equipment department energy conservation monitoring laboratory are merged; and the construction structure training room is merged into the building structure laboratory, the light steel structure assembly construction laboratory and the prefabricated building production laboratory (component production line) of Department of Construction Engineering. After the merger of the laboratories, under the premise of satisfying the personnel training, the repeated construction of the training room is avoided, which not only saves space, but also saves the cost of running the majors.

(2) To keep up with the requirements of industry transformation and upgrading, and avoid backward construction of laboratories.

Keeping up with the new requirements for the development of the construction industry under the new situation and cultivating new construction talents naturally have new requirements for laboratory equipment and experimental sites. Through sufficient industry research and construction of the necessity, feasibility and advancement of multiple arguments to avoid construction backwardness. At the same time, we should insist on building and integrating with the industry, and participate in industry production with laboratory equipment. Through the production revenue, the equipment is updated to reduce the later maintenance cost of the school.

References

- [1] Y. Li, Q. N. Li. Discussion on the Transformation and Upgrade of Architectural Design Major [J]. Western China Quality Education, 2018, 4 (10): 1-2.
- [2] National Development and Reform Commission: The National New Urbanization Plan (2014-2020). http://ghs.ndrc.gov.cn/zttp/xxczhjs/ghzc/201605/t20160505_800839.html
- [3] Xinhua News Agency. Opinions on Further Strengthening the Urban Planning and Construction Management published by the Central Committee of the Communist Party of China http://www.gov.cn/zhengce/2016-02/21/content_5044367.htm, 2016-02-21