



Consideration and Practice of Building Code First-class Undergraduate Curriculum Construction

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Abstract. The course "Building Code" is an essential guarantee for architecture students to acquire a comprehensive understanding of building codes, apply them to architectural design, and enhance their practical design skills. The core construction concept of "projects +" is proposed to meet the requirements of "high order, innovation, and challenge". The design of the project is optimized, refined, and quantified by taking the project as the foundation and cooperation as the guiding principle. This allows students to experience the learning process of practical application and inquiry. The learning process of inquiry truly achieves the effect of "learning by doing."

Keywords: Project-Driven, Collaborative Exploration, Building Code

1 Introduction

"Building Code" is a compulsory professional course for five-year undergraduate architecture education. This course requires students to be familiar with the basic principles and content of building-related regulations, codes, and standards. Students should also have the ability to follow and apply the current building design codes and standards in the design of buildings. If the architectural design process is compared to a game that follows certain rules, building codes are the rules of the game. Therefore, this course is an important guarantee for architecture students to master the knowledge of construction law, apply the relevant codes of architectural design, and enhance their practical ability in architectural design.

The current third round of reforms (Golden Course and First-class Curriculum Construction), which began in 2022, focuses on the question of how to learn effectively.

2 Features and Innovations

2.1 Linkage between the "HIC" Standard and the Requirements for High-quality Curriculum Development

The "HIC" standard ^[1], which stands for high order, innovation, and challenge ^[2]. High order refers to the objective of the course, which emphasizes the seamless integration of knowledge, skills, and qualities. It aims to cultivate students' comprehensive ability to solve complex problems and develop advanced thinking skills. Innovation means that the teaching content reflects the cutting edge of knowledge and modernity, while the teaching methods are advanced and interactive. Challenge means that the curriculum design promotes increased student engagement in learning and enhances their sense of achievement by allowing them to experience the benefits of rigorous learning and improve their overall quality ^[3-5]. The requirements for first-class curriculum construction include a goal-oriented and excellent curriculum, reform methods that make the classroom engaging, and scientific evaluation that keeps students actively involved ^[6]. These requirements also align with the relevant requirements of the "HIC" standard, which guide the direction of this course construction.

2.2 Issues That Need to Be Further Addressed

Combined with the specific learning situation of students and the requirements of the "HIC" standard and first-class curriculum construction requirements, it is evident that there is a need for further deepening the reform and construction of this course. Additionally, there is a need to address the current problems, which are as follows:

(1) How can project design be optimized to enhance students' analysis, synthesis, and evaluation skills?

(2) How can we innovate teaching design to present advanced and interactive teaching formats, and enhance students' learning initiative?

(3) How can assessment methods be reformed to enhance students' practical ability and professional attitude?

2.3 Features and Innovation Points of Teaching Reform

(1) Features: "Projects +" - project-driven, collaborative exploration

"Projects +" (project-driven, cooperative exploration) teaching is an open form instruction. Under the guidance of teachers, students cooperate to complete series number predetermined "projects". Through in implementation process these projects, students not only acquire complete but also develop their capacities. With the project as our focus and the principle of cooperation, we aim to effectively implement the "HIC" standard and strive for excellence, proactivity, and productivity ^[7].

(2) Key Innovations in Teaching Reform

With the project, our foundation is based on the principle of cooperation. We refine the project to meet the training objectives and the requirements of the "HIC" standard. It is a teaching method that emphasizes the development of students' comprehensive ability to "analyze, synthesize, and evaluate." [8] The course has transitioned from its original teaching mode, which primarily focused on theoretical instruction, to a "teaching + project" approach. This new approach emphasizes students' collaboration in completing well-designed projects and provides them with an opportunity to engage in the process of scientific inquiry learning. The teaching mode has shifted from being teacher-centered to being student-centered. It has also moved from solely focusing on classroom instruction to incorporating both in-class and out-of-class activities. Additionally, there has been a shift from emphasizing evaluation based solely on outcomes to incorporating both outcomes and the learning process [9].

3 Construction Practices

(1) Optimization of project design

In the project's session setting, the seamless integration of knowledge and the development of high-quality abilities are fully considered, while also cultivating comprehensive problem-solving skills and advanced critical thinking. Through the process of project implementation, the pathway for cultivating abilities is completed by integrating knowledge acquisition, project training, and skill development. Aiming to specific knowledge points, we carefully select suitable sources and materials, optimize the content for collaboration and verification, and establish a standardized format for conducting comprehensive verification. By establishing "prescribed actions" and identifying the points of implementation, we help students connect their learning with practical application and develop their ability to use and evaluate complex design phenomena.

(2) Optimization of teaching organization

Make the classroom a meeting point of knowledge sharing teaching and discussions.

Stay updated on the development status of architectural design and engineering construction, utilize the most recent versions of laws and regulations, familiarize yourself with the latest building code issues, and grasp the innovative and groundbreaking content of the course.

In the teaching process, we fully utilize multimedia technology and various network platforms such as the city college platform, and others. This approach aims to engage students actively in exploration and promote cooperation and interaction.

The objects of learning practice include both physical real environment and one's own architectural design work. Among them, the investigation, analysis, and evaluation of the physical environment place greater emphasis on inquiry, while the analysis, evaluation, and modification of architectural design outcomes prioritize personalization. A variety of targeted project practice activities enhance students' research skills and their ability to explore in both academic and personal contexts.

(3) Optimization of assessment methods

The teaching of this course requires each student to learn and apply knowledge in the project, and exercise their abilities comprehensively. By using the performance and impact of each group in the goal achievement process as the basis for evaluation and rewards, this mechanism can shift the focus from individual competition to competition between groups. This promotes cooperation and interaction within the group, while also enhancing the members' sense of responsibility and ability to work together. The building code course will consist of multiple evaluation indicators, including multiple evaluation content, themes, and methods (Table 1). Some projects are designed to be completed through cooperation, with an emphasis on deepening understanding and practical application through collaborative efforts. Regular assignments accounted for 40%, with project cooperation accounting for 20% and personal performance accounting for 20%.

Table 1. Evaluation content and proportion distribution of assessment

Level 3 project		Evaluation content		Proportion
		Type	Member	
Home-work	1: Terminology learning of relevant codes	Knowledge	Individual	10%
	2: On-site code verification of the completed building	Application	Group	5%
	3: Code verification of previous design assignment	Application	Group	15%
	4: Code verification of this year's design assignment	Application+ Creation	Individual	10%
Final exam		Knowledge + Application	Individual	40%

(4) The integration point and implementation method of "ideological and political education in curricula"

Clarify the "ideological and political" elements of this course^[10]. It aims to cultivate students with scientific and innovative thinking, as well as the ability to continuously learn. Additionally, it promotes students' teamwork and problem-solving skills through collaborative work and hands-on training^[11].

4 Conclusion

Through the curriculum construction and classroom teaching reform mentioned above, this course effectively stimulates students' curiosity and desire for knowledge. It also encourages students to actively participate in cooperative learning. These changes greatly enhance students' enthusiasm for learning, making the learning content more engaging and the classroom environment lively. As a result, students are more engaged and the overall quality of the curriculum has improved.

Contemporary architecture education has strong professional characteristics. Its multidisciplinary nature, comprehensiveness, and complexity, along with the need for broad knowledge and solid foundational skills, impose high demands on professional teaching^[12]. It is for this reason that this research group proposes the reform of the teaching method for Building Codes, based on "projects +". Through comprehensive thinking and exploration in designing, implementing, and evaluating projects, this approach guides students to achieve higher quality learning.

Many aspects still need to be explored and summarized in future practice^[13-15]. The contribution is hoped to improve the teaching effectiveness of the Building Code course.

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References

1. Shi J, Cai Y, Zheng Y. (2021) The practical path of first-class undergraduate curriculum construction: an example of quality curriculum construction in Nanjing University. *China University Teaching*, 368(04),49-53. <https://doi.org/10.3969/j.issn.1005-0450.2021.04.011>
2. Wu Y. (2018) Building a "golden course" in China. *China University Teaching*, (12),4-9. <https://doi.org/10.3969/j.issn.1005-0450.2018.12.002>
3. Lu G. (2018) The "golden course" of "water class". *China University Teaching*, (9),23-25. <https://doi.org/10.3969/j.issn.1005-0450.2018.09.007>
4. Jiang Y. (2020) How to square the dialectical relationship between teaching and learning-reflections on the construction of first-class undergraduate curriculum. *China University Teaching*, (11),11-16. <https://doi.org/10.3969/j.issn.1005-0450.2020.11.004>
5. Li Y. (2020) Reconstruction of curriculum teaching quality evaluation system and construction of "golden course". *Curriculum Education Research*, (42),3-4. <https://doi.org/10.3969/j.issn.1004-8359.2020.07.083>
6. Yang J, Yan Y. (2022) Econometric analysis and outlook of current research on first-class undergraduate curriculum construction in China. *China University Teaching*, (5),4-11. <https://doi.org/10.3969/j.issn.1005-0450.2022.05.002>

7. Xie Y, Huang Y, Li J, et al. (2019) Integrating innovation to effectively improve the quality of "golden class" construction. *China Educational Technology*, (11),9-16. <https://doi.org/10.3969/j.issn.1006-9860.2019.11.002>
8. Tang Z, Ji W. (2020) Golden course: paradigm characteristics, construction dilemma and breakthrough path. *China Higher Education Research*, (11),54-59. <https://doi.org/10.16298/j.cnki.1004-3667.2020.11.10>
9. Xu M, Fang S, Jiang X, et al. (2020) Reflections on the construction of first-class undergraduate courses. *Journal of Science and Education*, (11),3-4. <https://doi.org/10.16871/j.cnki.kjwhb.2020.04.002>
10. Lv L. (2020) The "golden course" of university in the context of "deep learning"-a review of historical logic, consideration criteria and realization path. *Journal of Higher Education Management*,14(01),40-51,62. <https://doi.org/10.13316/j.cnki.jhem.20191231.005>
11. Dong L. (2019) A theoretical discussion on the construction and reform of university curriculum. *University Education Science*, (06),15-22,120. <https://doi.org/10.3969/j.issn.1672-0717.2019.06.004>
12. Li M, Li Z, Liu J. (2019) "Seven degrees" teaching concept: the key features of university "golden class". *China Educational Technology*, (11),1-8. <https://doi.org/10.3969/j.issn.1006-9860.2019.11.001>
13. Mainardes, E. W., Silva, M. J., & de Souza Domingues, M. J. C. (2010). The development of new higher education courses. *Service Business*, 4(3-4), 271-288. <https://doi.org/10.1007/s11628-010-0095-1>
14. Gaffney, A. L. H. (2014). Communication Instruction in Landscape Architecture Courses: A Model and Effects on Students' Self-Efficacy. *Journal of Business and Technical Communication*, 28(2), 158–186. <https://doi.org/10.1177/1050651913513903>
15. Mitchell, B. (2016). Curriculum construction and implementation. *International Journal of Liberal Art and Social Science*, 4(4), 45-56.

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