

Research on the integration of ancient architecture surveying and mapping teaching based on social demand

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Abstract. through the ancient building surveying and mapping internship practice teaching reform, in meet the demand of normal teaching and teaching quality, on the basis of result orientation, to improve students' learning enthusiasm, striving to theoretical teaching and social needs (or practice) of the project, and the integration of teachers' scientific research direction of the optimal matching, and the introduction of new technology of surveying and mapping, diversified expression, to explore a effective teaching reform of practice teaching of surveying and mapping of ancient road.

1. Introduction

We will carry out a series of reforms in the mapping of traditional practices under the condition of "social needs", closely integrate teaching concepts with social needs, carry out practical and effective reforms in the design of practical teaching, truly link theory with practice, and improve existing practical teaching methods. The introduction of advanced surveying and mapping technology to make up for the shortcomings of the traditional teaching model and the formation of effective links in teaching have stimulated students' interest in and enthusiasm for studying the majors they study, thus laying a good foundation for their rapid adaptation to society and improving position positioning. And achieve the overall optimization of architecture majors. This research can optimize the course content and course assignments, establishing suitable for cultivating civil engineering applied talents platform, reform "listening to lectures, homework, test" of the traditional teaching, explore the teaching model of "theory - practice - application", through classroom practice project part, not only greatly enhance the engineering students' engineering practical, make teaching paper assignments to social services to the society, and solve the problem of local demand, get a win-win situation.

2. Current situation analysis.

The section headings are in boldface capital and lowercase letters. Second level headings are typed as part of the succeeding paragraph (like the subsection heading of this paragraph). General secretary xi jinping attaches great importance to the protection of traditional culture and cultural heritage, repeatedly emphasizing the protection, promotion and exploration of China's excellent traditional culture. The Beijing municipal government also issued a notice to reduce the construction of strange buildings, and to base itself on China's traditional culture. As one of the core contents of establishing records and archives, surveying and mapping can obtain specific data and relevant information of ancient buildings. It is the most basic link of conservation work and the prerequisite for other work. Without surveying and mapping records, research evaluation, planning and design, protection, repair and reuse are unimaginable. However, if the surveying and mapping results are not accurate or normative, the surveying and mapping drawings will certainly bring great trouble to the research, protection and repair, which requires that the surveying and mapping results must be very accurate. The original teaching methods without theory with practice, social demand, results oriented, it eliminated the students' learning initiative, a lot of time reduced the good ancient architecture

protection, carry forward the traditional culture of social mission, and weaken the students' feeling of traditional architecture, the final result leads to the final drawing of surveying and mapping data is not accurate, appear even drawing error is half a metre of surveying and mapping of the joke. At the same time, due to the teaching equipment did not follow up in time, also use the traditional tape measure, total station instrument and so on, resulting in some mapping difficult parts such as the roof, such as the ancient architectural elevation plan, will appear certain error; The unitary expression of teaching results reduces students' enthusiasm and teaching accuracy to some extent. Therefore, if the integrated reform of surveying and mapping teaching is carried out under the social demand, it will be an effective way to adapt to the development of The Times and improve the existing traditional teaching mode.

3. Coping strategies.

3.1 actively seek social needs and change the original passive teaching.

Combine specific surveying and mapping content with local demand to solve the problem of local demand^[1]. Since 2014, our surveying and mapping courses and architectural design courses have undergone a series of teaching reforms, and the highlight of which is to directly apply the teaching results to social areas and serve local areas. In September 2014 - January 2015, we combine the curriculum, thus mapping using the course content, lead the students to jinan halal south temple (built in the yuan dynasty, now province bump unit) lack of drawings, unable to retain the historical data of surveying and mapping, unable to declare the problem such as national key cultural relics protection units, for halal south temple obligations to conduct a comprehensive mapping and construction of atlas, given jinan halal south temple. The atlas has now been submitted to the shandong provincial cultural heritage bureau. The mapping atlas fills in the blank of the data of cultural relic building; At the same time, as a strong data support materials, in the application of national key cultural relics protection units, make an important contribution. In 2016, the combination of the curriculum, hexiang surveying and mapping completed jinan old wangfu pond and changs compound (Ming dynasty) of surveying and mapping, for historical building protection of jinan inheritance work made important contributions, and give the zhangs' compound posterity the atlas free of surveying and mapping, the changs compound special representative to thank the jinan university and pennants, due to the zhangs' important historical position in the yard, the move from the larger society, shandong TV, qilu evening news, university of jinan times has reported the major contribution of history work.

3.2 application of new technology.

The teaching of ancient architectural surveying and mapping has been using traditional surveying and mapping tools -- measuring tape, hanging ball, bamboo pole, etc. The use of traditional tools can exercise students' practical ability and cultivate their quality of bearing hardships and enduring pains. However, there are still shortcomings such as low efficiency and large error. Therefore, modern 3d scanner and other measuring instruments should be appropriately introduced into surveying and mapping teaching for cognitive teaching^[2]. With the application of new technology, buildings can be mapped faster and more accurately. 3d laser scanning technology has obvious advantages, it can go deep into the complex environment field scanning operation, directly collect all kinds of solid 3d data into the computer, use the software to form three-dimensional information of the object, and can directly measure the length, width, height, diameter and other data of any part. Especially in the surveying and mapping of ancient buildings with complex modeling and numerous components, the advantages of 3d laser scanning technology are fully reflected^[3]. The original data of optical measurement includes 3d point cloud, 3d grid surface and orthographic grid diagram, which has an impact on the traditional two-dimensional vector diagram expression based on CAD(Computer Aided Drawing: Computer Aided Drawing). BIM(Building Information Modeling) and GIS (geographic Information system: The expression, management and analysis of optical measurement results of Geographical Inforamtion System (Geographical Inforamtion System) has become a difficult and hot spot in the field of international research^[4-5].

4. Diversified expression.

The diversified expression of teaching results will fully display the teaching results of surveying and mapping. At the same time, students' deep participation in the diversified expression will further stimulate their learning enthusiasm, teaching accuracy and social responsibility. In addition to the traditional CAD surveying and mapping expression, three-dimensional modeling should be integrated into it, which can make the surveying and mapping results more three-dimensional and enable students to have an all-round in-depth understanding of the surveying and mapping objects. Secondly, we report the teaching results through group defense. The way of group defense can appropriately increase the students' study pressure and turn the study pressure into study motivation. Finally, an exhibition of teaching achievements is held, and students can turn their homework into display boards in the hall of the college. Through the exhibition of teaching results, the teaching surveying and mapping results of teachers and students have a good publicity, at the same time, the students at the next level have inspired their expectations and prospects for the future of this ancient architecture surveying and mapping course, forming a good orderly teaching inheritance.

5. The establishment of ancient architectural mapping features support point.

For example, our teaching and research team has set up the cultural research office of architectural surveying and mapping and the teaching AIDS room of ancient building components. This research office, relying on the architectural planning and design institute of jinan university, places ancient building components. Our hospital has the ancient Chinese architectural history, the ancient architectural practice of surveying and mapping, the traditional culture and the construction courses related to ancient architectural structures and culture, the original teachers only through the PPT and explain some construction and culture, with the component after research, thus can make students zero distance touch ancient architecture components, understand ancient architecture artifacts and housing relief system (such as a "sparrow for" how to post up, if it's just images, some students may not really understand, but see birds for physical, see ancient wood structure relationship with each other and tenon seeks structure, Can clearly understand the relationship between the wood structure); It can also spread the traditional architectural culture to the whole school.

Secondly, the ancient architectural components, especially the carvings in the south, have profound meanings. Architectural carvings and patterns in different periods and types can express various beautiful meanings. In combination with these architectural courses, I will explain the architectural culture to students in a close distance, so that what students learn in class is no longer boring.

In addition, our research group also held an exhibition of ancient architectural surveying and mapping and an exhibition of Chinese ancient architectural components culture: Neither "surveying and mapping practice of ancient architecture" nor "history of ancient Chinese architecture" nor "traditional culture and architecture" can be separated from architectural components and Chinese architectural culture. In conjunction with the teaching achievements of ancient architecture mapping internship assignments, group held in October 2018, exhibition of surveying and mapping buildings and the ancient Chinese architecture artifacts culture exhibition, the display range from architecture students expanded to all the teachers and students, the curriculum content and curriculum implied in Chinese traditional culture to carry on the good communication, the ancient building surveying and mapping, and other related courses at the same time had good cohesion and propaganda.

6. Summary

Under the condition of "social needs" series integration reform of the traditional practice of surveying and mapping, the teaching ideas, combined closely with the senior courses and social demand, from the concrete and effective reform on practical teaching design, the real make the theory with practice, contact practice engineering, improve the existing method of practice teaching, make up for the defect of traditional teaching mode, the introduction of new technology and new methods, such as 3 d

scanning, diversification on the expression of teaching achievements at the same time, the effectiveness of the link, and formed the teaching to inspire the student to the school of professional learning interest and enthusiasm, to quickly adapt to the society and improve the post position to lay a good foundation; At the same time, it also provides a certain benign development space for the construction of architectural brand specialty, and realizes the overall optimization of architectural specialty.

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References

- [1] liu qiang. Research on the practical teaching reform of ancient architecture surveying and mapping practice, *Shanxi architecture*, vol.15, pp. 216-217, 2018
- [2] wang lei. Current situation and reform methods of surveying and mapping teaching of ancient architecture, *Building materials and decoration*, vol.46, pp. 149-150, 2018.
- [3] Hu minshan. Application of 3d laser scanning technology in ancient construction surveying and mapping, *Journal of architecture*, vol.44, pp. 126-127, 1988.
- [4] Logothetis S, Delinasiou A, Stylianidis E. ISPRS Annals of the Photogrammetry, *Remote Sensing and Spatial information Sciences*, vol. 97, pp. 177-179, 2015.
- [5] Campanaro D M, Landeschi G, Dell 'Unto N, et al.3D GIS for cultural heritage restoration: A' white box 'workflow, *Journal of cultural heritage*, vol. 86, pp. 321-322, 2015.