World Journal of Educational Research
ISSN 2375-9771 (Print) ISSN 2333-5998 (Online)
Vol. 13, No. 1, 2026
www.scholink.org/ojs/index.php/wjer

Original Paper

Research on the Innovative Teaching Model of Municipal Engineering Measurement and Pricing in the Context of Digitalization

Tingting Nie[1*], Xiaojun Zhang[2], & Bingbing Guo[3]

[1] Chengdu College of Arts and Sciences, Chengdu, Sichuan 610401, China

[2] POWERCHINA Chengdu Engineering Corporation Limiter, Chengdu, Sichuan 611130, China

[3] Chengdu College of Arts and Sciences, Chengdu, Sichuan 610401, China

[*] Corresponding Author

Received: December 22, 2025 Accepted: December 02, 2025 Online Published: December 23, 2025

doi:10.22158/wjer.v13n1p1 URL: http://dx.doi.org/10.22158/wjer.v13n1p1

Abstract

In the current field of architectural education, the digital revolution is profoundly reshaping the professional talent training model, especially exerting a revolutionary impact on technical-intensive courses such as construction project measurement and pricing. This article systematically analyzes the feasible paths for the deep integration of modern information technology and traditional construction cost teaching, focusing on explaining how the new teaching paradigm based on emerging technologies like building information modeling and cloud computing can effectively enhance the quality of professional talent training. It also reveals the innovative application scenarios and significant achievements of digital tools in teaching aspects such as engineering quantity calculation and cost analysis. Additionally, the article proposes a series of practical optimization solutions from dimensions such as improving course objectives and content development, updating teaching resources, and improving teaching assessment and feedback, aiming to provide theoretical support and practical references for promoting the digital transformation of teaching in municipal project measurement and pricing.

Keywords

Digitalization, Municipal Engineering, Measurement and Pricing, Teaching Innovation

1. Introduction

The deep application of digital technology is redefining the core paradigm of the modern engineering measurement and pricing system. The integration of building information modeling and multi-dimensional data technology has enabled intelligent identification of engineering quantities and dynamic coupling of cost data. This technological integration significantly improves the measurement accuracy and pricing timeliness. Taking the construction practice of an urban underground utility tunnel as an example, the measurement efficiency has achieved a qualitative leap, and the deviation of the pricing results has shown a significant narrowing trend compared to traditional methods. The introduction of distributed ledger technology has established a trust mechanism with complete traceability for the pricing process. This has been empirically demonstrated in specific regional municipal infrastructure projects. The automated settlement system based on smart contracts has significantly compressed the long time cycle of the traditional settlement process. With the continuous advancement of the industrial digital transformation process, the ability profile of professional technical talents is undergoing fundamental changes. The market supply and demand relationship indicates that skilled engineering economic professionals who master building information modeling technology and possess big data processing capabilities have shown significant competitive advantages in terms of salary structure and career development space. These digital literacy skills have become the basic competency requirements for practitioners to participate in industry competition.

The current industry is undergoing a fundamental transformation from traditional quota pricing to intelligent cost models. This change directly promotes the reconfiguration of knowledge and capability in related professional fields. The working paradigm of engineering cost is being reshaped by the new workflow of "parametric modeling technology combined with artificial intelligence review", which requires industry practitioners to possess cutting-edge technical capabilities such as three-dimensional space measurement analysis and digital cost assessment. The latest provincial cost technical standards have accounted for a significant proportion of the provisions involving digital calculation methods, and a series of innovative technical requirements including aerospace remote sensing data processing and compliance verification of building information models have been clearly included. The rapid evolution of these industry technical standards has imposed substantial reform pressure on the talent cultivation system of higher education institutions, and it is urgent to establish a new teaching mechanism that matches them.

2. The Core Concepts

2.1 The Municipal Engineering

Municipal engineering, as the fundamental construction system for modern urban development, has expanded beyond the traditional scope of civil engineering and gradually evolved into a comprehensive discipline that integrates planning science, environmental ecology, and public management. Such projects not only cover the construction and maintenance of physical infrastructure such as roads and

bridges, water supply and drainage systems, but also involve strategic decision-making processes such as urban space resource allocation and public service facility layout. The level of its planning and implementation directly determines the efficiency of urban operation and the quality of residents' lives. In the context of accelerated urbanization, municipal engineering exhibits characteristics of technological integration and functional complexity. It needs to address traditional urban problems such as traffic congestion and flood prevention, as well as new technological changes such as smart water networks and sponge cities. Its development path reflects the evolution logic of human society from basic survival needs to high-quality development demands. From an engineering philosophy perspective, municipal facilities are both material carriers and institutional products. Their construction standards and management mechanisms essentially reflect the value orientation and technical capabilities of a specific social development stage. This dual attribute makes it an important dimension for observing the evolution of urban civilization.

2.2 The Measurement and Pricing Capability

In the fields of business operations and project management, the ability to accurately measure and price constitutes an important part of an enterprise's core competitiveness. This professional capability not only requires precise quantitative assessment of various resources, but also involves systematic analysis of cost components and in-depth understanding of the value transformation mechanism. Organizations with mature measurement and pricing capabilities can, through scientific calculation methods, convert production factors such as raw materials, human resources, and time costs into quantifiable economic indicators, thereby providing reliable data support for decision-makers. At the practical level, this capability is manifested in all aspects from basic cost accounting to complex value assessment systems, requiring practitioners to not only master professional measurement techniques but also possess acute business insight, capable of accurately identifying various hidden costs and potential values. Especially in the context of global competition, with the increase in supply chain complexity and the intensification of market volatility, outstanding measurement and pricing capabilities have become a key technical guarantee for enterprises to avoid operational risks, optimize resource allocation, and enhance profit levels. The cultivation of this professional quality requires a systematic approach.

3. Problems of the Traditional Case Teaching Model

In the development history of educational theory, Herbart's four-stage teaching method not only laid the rudimentary form of the modern teaching model, but also gradually formed a traditional teaching system with wide influence through the practical verification of its followers. This method has been regarded as the mainstream paradigm in educational practice for over two centuries, profoundly shaping the basic framework of education systems in many countries around the world, including our own. However, with the evolution of educational concepts and the deepening of curriculum reforms, this once effective teaching model is now facing a severe test of its appropriateness - its inherent theoretical framework and evaluation mechanism have become unable to meet the requirements of

cultivating students' core competencies in the current era, and it shows obvious limitations in achieving teaching goals.

3.1 The Survey of Municipal Engineering Measurement and Pricing Course

3.1.1 Teacher Interview

To systematically evaluate the effectiveness of the professional ability cultivation of architecture students in the field of engineering measurement and pricing, this study selected the teaching team of the "Municipal Engineering Measurement and Pricing" course for a special research interview. The focus of the research was on the analysis of the effectiveness of the current teaching model, including whether teachers fully integrated industry job competency standards to optimize and restructure the course content in their teaching practice, the construction of the assessment system for students' learning effectiveness in each knowledge module, and the actual competence performance of graduates in the engineering cost position. At the same time, an in-depth discussion was conducted on the applicability and implementation path of the modular teaching model based on competency-oriented output in this professional curriculum reform, with the aim of providing empirical evidence for improving the quality of the cultivation of the core professional ability of architecture professionals in measurement and pricing.

In terms of teaching methods, through in-depth communication with some teachers, we have learned that there are indeed several teaching issues worthy of attention in the current course teaching practice. The traditional transmission-style teaching method still dominates. Teachers often overly emphasize the one-way transmission of knowledge in the classroom, failing to effectively stimulate students' autonomous learning awareness and critical thinking ability. Under this teaching model, the students' principal position cannot be fully reflected. At the same time, the problem of insufficient innovation in teaching methods is also quite prominent. The presentation form of classroom teaching content is relatively monotonous, lacking flexible adjustments based on the characteristics of the course and individual differences of students. This has suppressed the learning enthusiasm of some students. More critically, there is a significant gap between the design of course content and its practical application. The combination of theoretical knowledge and practical operation is not tight enough, and the industry's cutting-edge development trends have not been timely integrated, resulting in a certain degree of mismatch between the training goals and career demands. All these problems may have a negative impact on the final teaching outcome.

In terms of students' mastery of knowledge, based on the feedback from multiple professional teachers and teaching observations, it is evident that there is significant room for improvement in the current teaching effectiveness of the "Urban Engineering Measurement and Pricing" course. Students exhibit a systematic weakness in their knowledge acquisition, mainly manifested as a lack of solid theoretical foundation, insufficient classroom concentration, and a lack of initiative in learning abstract concepts. This cognitive predicament directly leads to significant resistance in their course learning process, often falling into the trap of mechanical memorization and failing to achieve true internalization of

knowledge. Specifically in the professional practice field, although students can recite basic formulas in the calculation of beam reinforcement quantities, they are unable to understand the actual application logic of the reinforcement structure principles and anchoring techniques, resulting in frequent deviations in calculation results; in the practice of engineering pricing, they generally show confusion about the analysis method of comprehensive unit prices, and have a vague understanding of the core differences between quota pricing and list pricing. This situation where theory is disconnected from practice urgently requires improvement through the reform of teaching methods.

Regarding whether teachers focus on reconfiguring teaching content based on job capabilities, the current curriculum system has a serious disconnect between education and industry. Most teachers still follow the traditional framework of textbooks in their teaching implementation, mechanically conducting theoretical lectures according to the fixed chapter contents, without effectively aligning with the actual job capabilities of the industry. This separated practical teaching model leads to a significant deviation between the training effect and the employment requirements. Even though some teachers may mention the requirements of professional abilities in the case analysis part, due to the lack of systematic practical teaching design, students can only obtain superficial cognitive understanding. They cannot convert theoretical knowledge into practical operational abilities, nor can they establish a skill system that meets the job requirements. Eventually, this results in a structural contradiction between the quality of talent cultivation and the demands of the industry.

Regarding how to evaluate students' learning outcomes, through in-depth communication with several front-line educators, it was learned that currently, the assessment of students' learning achievements in teaching practice still mainly relies on traditional periodic written tests as the main evaluation method. This evaluation mechanism mainly focuses on testing students' mastery of the theoretical content of the textbooks. It is worth noting that the current evaluation system fails to fully incorporate systematic assessment of students' practical operation abilities. The practical teaching is often limited to the demonstration and explanation of pre-set cases in the textbooks, and teachers only conduct indirect inspections of students' practical learning effects through post-class assignment distribution, etc. This assessment method is difficult to comprehensively and objectively reflect the comprehensive development status of students' abilities.

3.1.2 The Student Questionnaire Survey

In order to gain a comprehensive understanding of the current situation of cultivating students' measurement and pricing capabilities, a questionnaire titled "Survey and Self-Assessment of the Current Situation of Interns' Training in Municipal Engineering Quantity Pricing" was designed. This questionnaire is divided into three dimensions. The first dimension is the basic information of the students. The second dimension is the teaching situation of the "Municipal Engineering Measurement and Pricing" course, mainly investigating the course content, teaching implementation of the "Municipal Engineering Measurement and Pricing" course, and whether the content and teaching implementation of this course are conducive to the cultivation of students' measurement and pricing

capabilities. The third dimension is the self-assessment form of students' measurement and pricing capabilities, which surveys the current situation of students' measurement and pricing capabilities. The corresponding questions for each dimension are shown in Table 1.

Table 1. Student Survey Questionnaire Design

Target Level	Criterion Level	Indicator Level
Dimension One	Student Basic Information	Gender
		Have you participated in any course learning?
		Have you participated in an internship in the field of construction cost?
Dimension Two	Teaching Situation of the "Urban Engineering Measurement and Pricing" Course	Are you clear about the learning ability goals of the course?
		Do you understand the precise meaning of the measurement and pricing capability?
		Are you clear about the scope of measurement and pricing capabilities?
		Are you clear that the ability to measure and price falls under the course's training of building cost professionals' job capabilities?
		Do you think there is a correlation between the teaching objectives of the course and the cultivation of the measurement and pricing capabilities of cost engineers?
		Have you clearly defined your learning goals for this course?
Dimension Three	Self Assessment of Students' Ability in Measurement and Pricing	The students' mastery level of the basic principles of engineering measurement and pricing, the basis for engineering pricing, the list pricing norms, the list pricing methods, as well as the measurement and pricing of each sub-item and component project during their course study.
		The students' proficiency in the skills required for the job positions.
		The main difficulties that students encountered in the study of the course "Urban Engineering Measurement and Pricing"

This research aims to deeply understand the learning situation and professional cognition of students in the engineering cost major during their internship period. The survey subjects are strictly limited to the current students in this major who are in the internship stage. To ensure the scientificity and validity of data collection, the research team conducted the survey through a professional online questionnaire platform and finally obtained complete questionnaire samples that met the research requirements. Regarding the measurement scale questions designed in the questionnaire, the researchers used the latest version of SPSS statistical analysis software to conduct rigorous reliability and validity tests to verify the reliability and structural validity of the scale, laying a methodological foundation for subsequent data analysis. The reliability analysis and validity analysis are shown in Table 2 and Table 3.

Table 2. Cronbach's Reliability Analysis

Variable	Sample Number	Cronbach α
11	154	0.897

Table 3. KMO and Bartlett's Test

KMO		0.934
Bartlett's Sphericity Test	Approximate Chi-square	255.982
	df	55
	p	0.000

3.2 The Issues Concerning the Municipal Engineering Measurement and Pricing Course

Through teacher interviews and student questionnaires, it was found that there are several problems in the municipal engineering measurement and pricing course, such as the inability to combine theory with practice, high requirements for the mastery of prerequisite courses, excessive reliance on teaching plans, and unreasonable course assessment schemes.

3.2.1 Theory Cannot Be Combined With Reality

The conventional teaching method of the municipal engineering measurement and pricing course has obvious problems of lagging teaching philosophy, and its essence still remains in the outdated paradigm of one-way indoctrination. Under this teaching framework, teachers overly rely on the theoretical formulas and measurement norms in the textbooks, regarding knowledge transmission as the sole teaching goal, while students become passive containers for knowledge absorption. The fundamental flaw of this teaching method lies in completely disregarding the cognitive construction process of the learning subjects. It neither pays attention to the individual experiences of learners nor establishes an effective connection between theory and practice. Due to the excessive emphasis on mechanical memorization and the repetition of standard answers, students' critical thinking abilities and

engineering adaptability never receive substantive development. What is even more alarming is that this teaching model artificially separates the multi-dimensional interaction that should exist in the teaching field, causing the academic dialogue and emotional connection between teachers and students, as well as among students themselves, to gradually become estranged. When faced with complex drawings and engineering quantity calculations in actual engineering projects, students trained by this teaching method often exhibit serious theoretical disconnection, lacking the ability to flexibly apply knowledge and being unable to form innovative solutions. Eventually, they find themselves in a dilemma in engineering practice.

3.2.2 High Requirements for Mastery of Prerequisite Courses

The professional course of Municipal Engineering Measurement and Pricing sets out various capability requirements for learners. Firstly, it demands that students possess a solid ability to interpret engineering drawings, not only understanding the drawing norms and technical standards of architectural plans and sections, but also cultivating the abstract thinking ability in three-dimensional space. Secondly, they need to systematically master the professional theoretical knowledge of construction materials in civil engineering, including the physical and chemical properties of various building materials and their specific application scenarios in engineering practice. At the same time, the course also requires that students must be proficient in the construction techniques and operation procedures of various professional trades in civil engineering, deeply understanding the process principles and operation key points of various construction methods, thereby laying a solid professional foundation for subsequent engineering measurement and cost analysis.

Before starting the study of the Municipal Engineering Measurement and Pricing course, students must have a solid foundation in their specialties, including but not limited to the principles of flat method drawing interpretation, architectural drawing and computer-aided design, the characteristics of common building materials, and the construction techniques of municipal engineering projects. Some learners, due to weak foundational knowledge from previous courses, have made many deviations in the subsequent preparation of engineering quantity lists and cost estimation: insufficient spatial imagination ability leads to inaccurate calculation of the engineering quantity of irregular components; poor drawing interpretation ability results in the omission of design document information; unclear understanding of construction techniques leads to misjudgment of the process flow, etc. This imperfect basic knowledge system directly affects the precise measurement of sub-items and parts of the project, causing systematic errors from component size calculation to overall list compilation, ultimately resulting in engineering quotations deviating from the actual market level, seriously affecting the accuracy and scientificity of cost control.

3.2.3 Over-reliance on Lesson Plans

The design of traditional teaching plans often exhibits a one-sided characteristic, with the teacher serving as the absolute leader and undertaking all the work of preparing the teaching plan alone. Meanwhile, the students, as the learning subjects, are completely excluded from this creative process.

From a theoretical perspective, an ideal teaching plan should be based on a profound understanding of the textbook system and a comprehensive knowledge of the individual characteristics of students. However, in practical operation, most teachers tend to carry out their work according to uniform teaching syllabuses, standard textbooks, and ready-made teaching materials, treating the student group as a homogeneous whole, failing to fully consider the significant differences in cognitive levels, thinking patterns, and acceptance abilities among different learners. Such standardized teaching plans inevitably lead to the singularity of teaching activities, not only requiring uniformity in learning content and schedule, but also adopting a uniform model in teaching methods and evaluation standards. As a result, some students gradually lose their learning interest and development potential due to their inability to adapt to this rigid teaching model, ultimately making it difficult to achieve the personalized cultivation goal of education.

The course planning paradigm under the current education system generally exhibits significant imbalances. The decision-making power for teaching strategies is completely concentrated in the hands of educators, while learners, as the core beneficiary group, are in a passive acceptance position in this crucial decision-making process. From the perspective of educational theory, a truly effective course design should be based on the systematic deconstruction of the subject knowledge system and the precise grasp of the cognitive characteristics of learners. However, in actual educational practice, it often overly relies on established teaching frameworks, fixed textbook content, and pre-prepared teaching resources, simply classifying learners with distinct individual differences as homogeneous objects, seriously neglecting the diversity characteristics of learners in terms of knowledge foundation, thinking mode, and learning efficiency. This inflexible standardized teaching design inevitably leads to mechanical repetition in the teaching process, whether it is the pace of knowledge transmission or the methods of ability cultivation, adopting a single approach. More critically, the evaluation mechanism also adopts a completely unified measurement standard. The direct consequence is that some learners with special talents or unique thinking patterns gradually lose their enthusiasm for learning and innovative potential in this rigid educational environment, ultimately making it difficult to truly implement the core value of individualized education in education.

3.2.4 The Assessment Plan for the Course Is Unreasonable

As a crucial part of the teaching process, course assessment plays multiple educational functions and holds significant social value. From the perspective of individual development, this academic evaluation mechanism not only relates to the assessment of scholarships, the review of organizational development qualifications, and other phased goals, but also directly determines the quality of academic certification acquisition and the choice of career development paths; for higher education institutions, a scientific and rigorous assessment system is not only an important benchmark for evaluating teaching outcomes, but also a core driving force for promoting teaching model innovation. Its completeness directly affects the specification positioning of talent cultivation and the construction

of the social reputation of the institution, ultimately determining the competitive position and development potential of the educational institution in the higher education ecosystem.

In the current education system, the conventional course evaluation mechanism mainly relies on elements such as classroom participation, post-class case analysis, and final tests to form a comprehensive evaluation system. However, due to the objective limitations of teaching time, post-class assignments often exhibit homogeneity and are difficult to truly reflect the depth of students' understanding and application ability of professional knowledge. Their scoring standards usually adopt a binary division model of percentage or grade system. This long-standing assessment method has obvious limitations in implementation - not only does the evaluation carrier basically remain limited to paper-based media, but its evaluation dimensions are also too simplistic, resulting in the final assessment results often failing to truly reflect the real differences in learning effectiveness, and even possibly causing systematic deviations. Educators urgently need to build a more scientific assessment system, focusing on cultivating students' core competencies of independent thinking and solving complex problems. This has become a key issue that needs to be broken through urgently in the current teaching reform field.

4. The Optimization Strategies for Municipal Engineering Measurement and Pricing Course

4.1 The Improvement of the Development of Course Objectives and Content

When designing the teaching curriculum for municipal engineering measurement and pricing, the primary task is to establish a clear training direction, which requires close integration with the development trends of the construction industry and the actual job competency requirements. From the perspective of knowledge system construction, the course content should systematically cover the complete knowledge framework of municipal engineering basic principles, engineering quantity calculation, and cost management, while ensuring the comprehensive integration of current national norms and industry standards, enabling learners to accurately interpret the technical details of construction drawings and deeply grasp the substantive impact of various engineering material characteristics and construction processes on project costs. By introducing representative actual engineering cases for comparative analysis, especially selecting internationally renowned construction projects as research objects, it can visually demonstrate the flexible application of measurement and pricing theories in complex engineering environments, helping trainees understand the differences and optimization potential of different cost control methods in practical applications. In terms of practical ability cultivation, the focus is on strengthening in-depth application training of BIM technology, not only requiring mastery of basic modeling operations, but also emphasizing the cultivation of collaborative working ability based on the BIM platform and the thinking of full-process cost control; in addition, integrating virtual reality and augmented reality technologies to construct immersive teaching scenarios can significantly enhance trainees' cognitive level of architectural spatial relationships, enabling them to proactively identify potential technical conflicts and cost risks in the

design conception stage. This future-oriented technical literacy will become an important competitive advantage in career development.

4.2 To Update Teaching Resources

To establish a modern teaching system, it is urgent to create a systematic digital educational resource platform as the fundamental support. Through the design of the pre-class self-study phase, students are guided to utilize online course resources and literature materials to complete knowledge acquisition, and then concentrate the limited classroom time on in-depth discussions and practical application sections. Implementing the team-based learning model can not only cultivate students' collaborative working abilities but also help them enhance practical skills in project management and problem-solving in simulated workplace scenarios. Inviting industry experts to conduct special lectures and organizing on-site visits can effectively expand students' cognitive boundaries and help them grasp industry development trends and the application of cutting-edge technologies. At the same time, a scientific teaching evaluation system needs to be constructed. Through diversified assessment methods such as practical outcome evaluation, periodic tests, and project process feedback, real-time monitoring and precise guidance of students' learning effectiveness can be achieved, ensuring continuous improvement of teaching quality.

4.3 Teaching evaluation and feedback improvement

In the teaching of professional courses in higher education, the subject of "Municipal Engineering Measurement and Pricing", which is highly practical, is facing an important opportunity for digital transformation in its teaching evaluation system. The traditional assessment mode has significant limitations. Teachers need to spend a lot of effort on manual grading, which is both inefficient and difficult to achieve precise diagnosis of students' learning situations. A teacher at a certain university introduced artificial intelligence technology to build a new teaching evaluation system. This system has multi-dimensional analysis capabilities: its core module can intelligently identify and grade the engineering measurement assignments submitted by students, automatically generating technical analysis including error location and optimization suggestions; the expansion module integrates multiple data such as the quality of the assignments, test scores, and classroom interactions, and uses machine learning algorithms to generate detailed learning diagnosis reports. These intelligent analysis results not only objectively present the relative position of students in the professional ability matrix, but also conduct in-depth analysis from professional dimensions such as knowledge mastery, computational logical thinking, and standard application level, providing data support for teachers to formulate differentiated teaching plans.

5. Conclusion

In the context of the digital revolution sweeping through the construction industry, based on an in-depth investigation and analysis of the current teaching situation of municipal engineering measurement and pricing, this paper systematically summarizes the core challenges faced by the current curriculum

system. By integrating cutting-edge technology application scenarios, it focuses on exploring the practical value of the building information modeling system in engineering quantity calculation, and innovatively introduces immersive virtual teaching environments and intelligent data analysis technologies to restructure the traditional teaching model. This deeply integrated educational innovation path that integrates modern technology not only fundamentally breaks through the time and space limitations of traditional classrooms, but also effectively improves the accuracy and practical application efficiency of professional teaching through three-dimensional visual interactive experiences and real-time data feedback mechanisms.

Acknowledgement

Thanks for the project of Research on the Hybrid Teaching Model of Municipal Engineering Measurement and Pricing under the Empowerment of Digital Tools (Project Number: MBXH25YB23).

References

An, F. J., Wang, Y. H., & Chen, H. J. (2025). Teaching Design and Practice of BOPPPS+ Modularized Instruction Based on the OBE Concept - Taking "Installation Engineering Measurement and Pricing" as an Example. *Industry and Science & Technology Forum*, *24*(20), 186-189.

Dong, X. F., & Wang, H. P. (2025). Exploration and Practice of the Research-based Teaching Model of "BOPPPS+PBL" - Taking the Course of Engineering Measurement and Pricing as an Example. *Journal of Henan Institute of Urban Construction*, *34*(04), 122-127.

Hao, M. M. (2025). *Research on Teaching Practice for Improving the Measurement and Pricing Skills of Vocational School Students in Architecture*. Guizhou Normal University.

Hu, Q., Zhu, L., Deng, L. F., & Xue, C. X. (2025). Digital Teaching Reform and Practice in Engineering Cost Management - Taking the Course of Building Installation Engineering Measurement and Pricing in Higher Vocational Education as an Example. *Innovation and Entrepreneurship Theory Research and Practice*, *8*(14), 41-44.

Lei, Y., & Bao, D. J. (2024). Teaching Research on "Municipal Engineering Measurement and Pricing" Based on Engineering Examples. *University*, (04), 38-41.

Li, J., & Sun, Y. X. (2024). Innovative Practice of Engineering Measurement and Pricing Course under the Digital Background. *Residential Industry*, (11), 79-81.

Li, S. W. (2025). Exploration and Practice of Digital Construction Engineering Measurement and Pricing Hybrid Teaching Based on OBE. *Journal of Huzhou Vocational and Technical College*, *23*(02), 16-20+31.

Qian, L. (2019). Research and Practice on Case Teaching of "Municipal Engineering Measurement and Pricing" Integrated with BIM Technology. *Education Modernization*, *6*(A4), 232-234.

Wang, Y. P., Zhou, Z. Y., Zheng, Y. H., & She, Y. J. (2023). Reform and Practice of Non-standardized Answer Examination Method for "Municipal Engineering Measurement and Pricing" Course. *Chongqing Architecture*, *22*(05), 70-72.

Xie, Q. S., Chen, F. R., Wu, H. L., Wu, S. Y., & Zhang, X. (2025). Research on the Transformation of Teaching Methods for Architectural Engineering Measurement and Pricing Courses in Secondary Vocational Education under the New Trend of Artificial Intelligence. *Information and Computers*, *37*(18), 161-163.

Yuan, J. J. (2023). Project-based Teaching Reform and Practice of Engineering Measurement and Pricing Course. *Journal of Guangxi Radio and Television University*, *34*(04), 88-92.

Zhang, H. L. (2020). Preliminary Research on Hybrid Teaching of BIM Technology Applied to Municipal Engineering Measurement and Pricing Course. *Hebei Agricultural Machinery*, (06), 121-122.