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Deepening and Practice of Academy-System Talent Training Under the Background of Comprehensive Vocational Education Reform

Xiaoyu Sun*

Shanghai Construction Management Vocational College, Shanghai 201702, China

**Author to whom correspondence should be addressed.*

Abstract: In response to the requirements of the "typification" development of vocational education and the "integration of industry and education" reform, Shanghai Construction Management Vocational and Technical College Xuhui Campus innovatively implements the academy system management mode for five-year integrated students, focusing on four major professional groups such as "digital municipal" to build a three-dimensional education system of "cultural foundation, skill empowerment, and personality development." At the grassroots level of cultural construction, reconstruct the general education curriculum system through hierarchical teaching, professional group-oriented curriculum modules, etc. In terms of skill empowerment, we will create an integrated training chain of "cognition training application" through the ability advancement map and workshop-based enlightenment. In terms of personality development, we rely on innovative management mechanisms such as cross-disciplinary communities and the three-track mentorship system. At the same time, we will strengthen the guarantee from five aspects, including organizational system, faculty team, and resource platform, and form a closed-loop management through dynamic quality monitoring, aiming to cultivate innovative and composite high-quality technical and skilled talents for Shanghai's urban construction management.

Keywords: Academy system; Education management; Talent training

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1. Analysis of the current situation of academy-system education under the background of vocational education reform

Against the background of the country vigorously promoting the "typed" development of vocational education and emphasizing the reform of "integration of production and education" and "combination of education and training," the academy system, as an innovative form of vocational education talent training model, is experiencing a development stage from exploratory pilot to gradual deepening, showing distinct characteristics of "vocational education adaptation." Most academies are built around their core majors (such as urban construction, agricultural and animal husbandry technology, and intelligent manufacturing), realizing the binding

development of "professional group + academy" [1–3].

Although the vocational education academy system has developed rapidly, it faces three core challenges that restrict its in-depth integration with vocational education reform:

(1) The "vocational education attributes" of the curriculum system need to be strengthened. Some academies continue to use the general education curriculum framework of general education, with low coupling with professional skills and job needs. For example, the courses of engineering academies are not combined with vocational education scenarios, leading to the disconnection between "culture as the foundation" and "skills as empowerment."

(2) The "depth of school-enterprise collaboration" is insufficient. Most academies' cooperation with enterprises remains superficial and does not involve core links. Some "industrial academies" are "in name only" due to limited enterprise resource investment and mismatched interest demands.

(3) The "standard absence" of the evaluation system. At present, there is a lack of exclusive evaluation standards, and most institutions use traditional evaluation methods that do not include core vocational education indicators, making it difficult to accurately measure the effectiveness of talent training [4–6].

2. Deepening "Culture as the Foundation": Reconstructing the curriculum system to consolidate the foundation of humanities and sciences

2.1. Reform goal

Break the "general education tendency" of general courses, establish a general education system deeply coupled with professional groups, and provide solid theoretical and thinking support for skill learning.

2.2. Specific measures

(1) Implement hierarchical teaching according to the needs of professional groups

Courses such as mathematics, physics, chemistry, and information technology establish three dimensions, basic level, improved level, and extended level, oriented by professional needs, accurately connect with majors, and optimize teaching content. Teachers undertaking different professional courses conduct in-depth research on the knowledge needs and skill requirements of each major, accurately locate the connection points between general courses and professional courses, and optimize teaching content. According to the teaching goals of different levels, select and integrate general knowledge, add professional cases and practical projects, making the teaching content more targeted and practical (**Table 1**) [7].

Table 1. "Professional group-oriented" general curriculum modules

Professional groups	Examples of general curriculum modules	Strengthened abilities
Digital Municipal Engineering / Intelligent Construction	"Applied Engineering Mathematics", "Basic Physics for Intelligent Construction", "Building Information Modeling (BIM) and Data Thinking"	Mathematical modeling, mechanical analysis, data processing, etc.
Landscape Art	"Landscape Aesthetics and Art Appreciation", "Basic Ecology", "Plants and Environmental Chemistry"	Art appreciation and aesthetics, etc.
Smart City Management	"Logic and Communication in Urban Management", "Basic Information Technology and Application", "Introduction to Urban Sociology"	Information literacy and social cognition, etc.

(2) Develop cultural literacy courses with industry characteristics

Establish an interdisciplinary teacher team (such as subject teachers + industry teachers + enterprise mentors) to develop and construct cultural literacy courses with industry characteristics. For example, offer the course "Architecture and Humanities" in construction-related majors, exploring the connection between architectural functions, aesthetics, and culture through the analysis of classic cases such as the Forbidden City and the Sydney Opera House; the course "Architectural History and Craftsman Spirit" allows students to understand the industry values of "striving for excellence" through interviews with intangible cultural heritage inheritors and visits to ancient architectural restoration sites [8].

(3) Innovate the "project-embedded" teaching model

Adopt PBL (Project-Based Learning) to integrate general knowledge into real projects. For example, in the courses of the School of Smart City Management, let students use Excel or Python to analyze campus energy consumption data and provide suggestions for energy-saving transformation; in the urban pocket park ecological restoration and community cultural integration project of the School of Landscape Technology and Art, use color psychology to design color schemes for landscape sketches.

(4) Offer combined short-term courses

Irregularly invite outstanding on-campus teachers, external industry experts, scholars, skilled craftsmen, and outstanding alumni to offer combined courses (short-term courses or lectures) for students who wish to further develop in related fields, helping them understand industry trends and realize hierarchical ability training. Students can also be organized to visit science and technology venues and red bases to cultivate their scientific literacy and patriotic feelings.

3. Strengthening "Skills as Empowerment": Connecting training paths to achieve progressive ability development

3.1. Reform goal

Give play to the advantages of five-year consistent continuous training, systematically design skill training paths, and construct an integrated skill training chain of "cognition-training-application" [9].

3.2. Specific measures

(1) Establish a "skill progression map"

Based on the post-ability requirements of the four major professional groups, design the five-year skill training path. Clarify that the core ability goal of the first two years at Xuhui Campus is "mastery of basic skills and vocational cognition," and develop the Professional Skill Progression Manual, marking skill points, assessment standards, and curriculum connection relationships.

(2) Implement "workshop-style" skill enlightenment

Introduce "micro-workshop" practices in the first two years, such as the "Intelligent Construction Model Workshop," allowing students to establish professional interests and understand principles through practice. At the same time, invite enterprise technicians and intangible cultural heritage inheritors to the academy to set up "master workshops" to pass on the craftsman spirit and cutting-edge technologies.

(3) Establish professional associations integrating training and competitions

Set up professional associations at Xuhui Campus, connecting with skill competitions at all levels. Build a "trinity" teaching model based on classroom teaching, supported by association training, and driven

by skill (discipline) competitions, forming a three-level progression system, and realizing the efficient training of skilled talents through "learning by doing and practicing by competing."

4. Promoting "Personalized Development": Innovating academy management to help students' all-round growth

4.1. Reform goal

Construct a tutor system led by Party building, paired co-construction, and collaborative education, as well as a student-oriented, peer-assisted autonomous management system. Relying on the "Yunxin Workshop" Party-mass comprehensive activity center, give play to the advantages of the academy system's living community, build an interdisciplinary communication platform, stimulate students' potential, and promote their all-round growth [10].

4.2. Specific measures

(1) Create an "interdisciplinary learning and living community"

Form interdisciplinary learning groups based on interests, such as "Smart City Construction". Carry out learning salons and student activities relying on the "Yunxin Workshop" Party-mass comprehensive activity center, encouraging students from different majors to conduct interdisciplinary discussions and creative designs around real issues such as urban governance [11].

(2) Implement a three-track parallel education mechanism of "class teacher + career tutor + growth mentor"

On the basis of the daily management of class teachers in the academy system, assign career tutors to students through Party building joint construction in accordance with the principle of "two-way selection and allocation on demand". Tutors comprehensively guide and instruct students to achieve the goal of "promoting students' all-round development" [12].

(3) Implement the "2+1" model for growth mentors in the academy system

Two senior students (one from the second grade of Xuhui Campus and one from the senior grade of Qingpu Campus) are paired by major to help one freshman dormitory. Growth mentors pay attention to the living adaptation of guided students and guide emotions and values through "peer tutoring".

(4) Construct a "digital portrait" evaluation system

Use information technology to record students' performance in skill learning and other aspects, generating a "student growth digital portrait." The evaluation dimensions include "skill level," providing data support for students' personalized development.

5. Guarantee measures

5.1. Organizational and institutional guarantee

(1) Establish a special leading group

Led by college leaders, composed of the heads of the Academic Affairs Office, Student Affairs Office, secondary colleges of each major, and the Basic Teaching Department. Clarify the division of responsibilities of each department, hold regular joint meetings to coordinate and solve key issues such as resource allocation and progress promotion.

(2) Improve the institutional support system

Formulate guiding documents such as the Standards for the Construction of General Courses in the

Academy System, Measures for the Management of Skill Workshops, and Assessment Rules for Career Tutor Work, clarifying the implementation norms for measures such as hierarchical teaching, project-embedded teaching, and digital portrait evaluation; establish a "three-dimensional education" effectiveness evaluation mechanism, incorporating indicators such as students' skill certificate acquisition rate, interdisciplinary project participation, and enterprise satisfaction into the annual assessment, ensuring that the reform has rules to follow and achieves tangible results [13].

5.2. Teacher and team guarantee

(1) Deepen the training of "double-qualified" teachers

Implement the "Teacher Enterprise Practice Program," requiring general course teachers and professional teachers to jointly participate in enterprise projects (such as BIM technology application, smart city management case development) to improve practical teaching capabilities; introduce industry technical backbones, intangible cultural heritage inheritors, engineering masters, etc., as part-time teachers, and form "interdisciplinary teaching teams" (such as "Engineering Mathematics + BIM Technology" and "Landscape Aesthetics + Ecology" combinations) to jointly develop curriculum modules and practical projects [14].

(2) Strengthen the construction of the tutor team

Establish a training system for "class teachers - career tutors - senior tutors," regularly carry out special training on career planning guidance, interdisciplinary communication skills, mental health education, etc.; set up a "tutor development fund" to support tutors to participate in industry seminars and teaching innovation research projects, improving their guidance capabilities and professional vision.

5.3. Resource and platform guarantee

(1) Optimize the allocation of teaching resources

Increase resource investment in hierarchical teaching and project-based learning, build a "professional group-oriented" general course resource library (such as engineering mathematics case library, landscape aesthetics digital resource platform); upgrade laboratory and workshop facilities, equipped with cutting-edge tools such as BIM software, intelligent surveying and mapping equipment, and ecological simulation systems, meeting the practical needs of "micro-workshops" and "master workshops."

(2) Deepen school-enterprise collaborative education

Co-build "practical teaching bases" with leading enterprises in Shanghai's urban construction, landscape design, smart city and other fields, introducing real enterprise projects (such as campus energy consumption analysis, community pocket park design) as students' practical topics; jointly set up "skill scholarships" and "innovation project incubation funds" with enterprises to encourage students to participate in skill competitions and entrepreneurial practices.

(3) Build an interdisciplinary communication platform

With the "Yunxin Workshop" Party-mass comprehensive activity center as the core, build an online "smart academy" platform, integrating information on interdisciplinary learning groups, community activities, industry lectures, etc., to realize resource sharing and activity reservations; regularly organize "enterprise open days" and "industry carnivals", inviting experts from different fields to communicate face-to-face with students to broaden their professional horizons [15].

5.4. Funding and incentive guarantee

First, increase investment in educational funds to strongly support curriculum development, workshop construction, tutor subsidies, student innovation projects, etc. Second, implement diversified incentive measures. Teachers who participate in hierarchical teaching reform and develop interdisciplinary curriculum modules will be given preferential treatment in professional title evaluation and teaching achievement award selection; students who perform outstandingly in skill competitions and interdisciplinary projects will be given priority in recommending internships, enterprise scholarships, and included in the "innovative thinking" dimension of the "digital portrait" evaluation system, linked to further education and employment recommendations.

5.5. Quality monitoring and feedback guarantee

(1) Establish a dynamic monitoring system

Use the "student growth digital portrait" platform to real-time track students' performance in general course learning, skill training, and community activities, and regularly generate "talent training quality analysis reports" to provide data support for curriculum adjustment and tutor guidance optimization.

(2) Smooth feedback channels

Conduct student forums, career tutor and growth tutor evaluation meetings, and graduate follow-up surveys every semester to collect opinions and suggestions on curriculum content, skill training, and management services; set up an "academy reform suggestion box" to encourage teachers and students to participate in the optimization of the education system, forming a closed-loop management of "practice-feedback-improvement."

6. Conclusion

Facing the future, the academy system of Xuhui Campus will always take "serving urban construction and cultivating industry newcomers" as its mission. By consolidating the humanistic foundation, strengthening the skill core, and stimulating personalized potential, it not only helps students achieve a smooth transition from "campus people" to "professional people" but also cultivates their lifelong learning abilities and social responsibility, delivering "technically proficient, culturally accomplished, and innovative" high-quality talents for Shanghai and even the national urban construction field.

Disclosure statement

The author declares no conflict of interest.

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