

Practical Dilemmas and Breakthrough Paths of Cultivating the Craftsmanship Spirit in the Modern Apprenticeship System

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Abstract: *This paper takes the modern apprenticeship system as the research object to cultivate the craftsman spirit, and systematically analyzes its realistic dilemma, international experience and breakout path. The research points out that there are core problems such as insufficient awareness of cultivation, lack of spiritual elements in curriculum teaching, insufficient integration of industry and education, and impact of social values. By referring to the beneficial experience of the German dual system, the registered apprenticeship system in the United States and the new apprenticeship system in Australia, it is proposed to build a four-dimensional collaborative path guided by the government, dominated by enterprises, led by colleges and universities, and active by students: The government should strengthen the system supply and policy incentive, enterprises should deepen the responsibility and resource input of education, colleges and universities should promote the curriculum reform and cultural infiltration, students should activate the endogenous motivation and professional identity, jointly promote the craftsman spirit to effectively take root in the modern apprenticeship system, and provide systematic solutions for the cultivation of high-quality technical and skilled talents.*

Keywords: *Modern Apprenticeship System; Craftsmanship Spirit; Practical Dilemmas; Experience Reference; Breakthrough Paths*

1. Introduction

Under the background of the in-depth adjustment of the global economic pattern and the accelerated evolution of the scientific and technological revolution, vocational education, as a talent "reservoir" to promote industrial upgrading, plays an increasingly prominent role in the shaping of talent training mode and professional spirit. Craftsman spirit is a combination of professional belief, technical ethics and pursuit of excellence formed in professional activities, and is the best interpretation of a country's manufacturing level [1]. Modern apprenticeship system is the product of the deep integration of traditional apprenticeship system and modern vocational education [2]. China's manufacturing industry is transforming to the direction of intelligence, and the demand for technical and skilled personnel has shifted from "quantity first" to "quality first", requiring craftsmen with the spirit of pursuing excellence and innovation. The traditional vocational education model has some problems, such as the disconnection between theory and practice and the insufficient depth of school-enterprise cooperation, which is difficult to meet the industry's demand for high-quality talents.

Modern apprenticeship system takes the inheritance of skills as the core, which can not only inherit vocational skills, but also inherit professional spirit, and is the main carrier for vocational colleges to cultivate students' craftsman spirit. The deep integration of schools and enterprises and mutual benefit and win-win situation are the basis of carrying out modern apprenticeship talent training. Through work-study alter-country and job rotation training, schools and enterprises jointly participate in the teaching and management of apprentices, and tailor craftsman technical and skilled talents to meet the needs of enterprises in the way of master leading apprentice. Craftsman spirit focuses on innovation in inheritance and inheritance in innovation [3]. Through the words and deeds of enterprise masters and the experience of the enterprise site, apprentices internalize the craftsman spirit in their hearts and externalize it in their practices, so as to realize the inheritance and innovation of the craftsman spirit. China is moving from a manufacturing giant to a manufacturing power, and is in urgent need of a large number of high-quality technical and skilled personnel. The research of this subject is in line with the document requirements of the Opinions of the Ministry of Education on the Pilot Work of Modern Apprenticeship System. This breaks through the traditional research of the single training subject of

universities or enterprises, from the government, enterprises, universities and students and other multi-dimensional break through the barrier, further enrich the theoretical system of the cultivation of craftsman spirit, enhance the adaptability of vocational education, cultivate more high-quality technical and skilled personnel recognized by the society and satisfied by enterprises, and explore new theories, new ideas and new countermeasures for promoting the apprenticeship system with Chinese characteristics.

2. The Realistic Dilemma of Modern Apprenticeship System to Cultivate Craftsman Spirit

The cultivation of craftsman spirit by modern apprenticeship system is faced with multi-dimensional realistic obstacles from multiple subjects, teaching system, cooperation mechanism and social environment.

2.1 The Cultivation of Craftsman Spirit is not in Place

In the practice process of modern apprenticeship system to cultivate craftsman spirit, there are still significant deviations in the understanding of its connotation and value. On the one hand, some enterprises simply equate the spirit of craftsmanship with the skilled operation of post skills, and only focus on students' short-term skill attainment, ignoring the professional belief, professional attitude, excellence and humanistic spirit of pursuing excellence behind it, resulting in the training process of "emphasizing skill and ignoring path." On the other hand, some vocational colleges do not fully understand the deep educational significance of craftsman spirit, fail to effectively integrate into the curriculum system and evaluation standards, and the theoretical teaching is disconnected from the spirit shaping. In addition, under the influence of the utilitarianism employment concept, students are more inclined to take skills as a means of making a living, and they do not have a strong sense of identity with the quality of persistent, dedicated and patient craftsmen, and lack endogenous motivation. This lack of systematic cognition makes the cultivation of craftsman spirit superficial, and it is difficult to form an effective cultivation mechanism of school-enterprise coordination and teacher-student resonance, which hinders the all-round growth of high-quality technical and skilled talents.

2.2 The Course Teaching Lacks the Element of Craftsman Spirit

Under the framework of modern apprenticeship system, the curriculum teaching system fails to integrate the elements of craftsman spirit organically. Many courses jointly developed by universities and enterprises still focus on the teaching of operational skills, and the curriculum objectives and content design do not pay enough attention to the hidden dimensions such as professional ethics, humanistic quality, innovative thinking and quality consciousness required by the craftsman spirit, resulting in "two skins" of spiritual cultivation and skill training. In the process of teaching implementation, although the enterprise mentors are skilled, they often lack the awareness and ability to penetrate the spiritual connotation into the technical explanation. Because school teachers are separated from the front-line production situation, it is difficult for theoretical teaching to vividly interpret the actual value of craftsman spirit. At the same time, the teaching evaluation system focuses too much on the skill attainment rate and task completion efficiency, and lacks the multi-dimensional evaluation index of the spiritual characteristics of apprentices, such as rigorous attitude, lasting concentration and pursuit of perfection. This systematic lack makes the cultivation of craftsman spirit lack effective curriculum carrier and teaching support, and it cannot be internalized into students' professional character and value orientation through daily teaching practice.

2.3 The Integration of Industry and Education is not Deep Enough

The cooperation between schools and enterprises is only at a superficial level, such as internship arrangements and mutual employment, without establishing a deeply integrated strategic synergy and cultural co-cultivation mechanism [4]. Enterprises, considering short-term production efficiency and the protection of business secrets, merely view apprentices as supplementary labor force and do not incorporate them into their long-term talent development strategies. They are reluctant to invest sufficient resources in systematic spiritual inheritance and cultural immersion, making it difficult for apprentices to deeply understand and internalize the core pursuits of the enterprise regarding quality, reputation, and innovation. Schools are in a passive position in the cooperation, and the talent cultivation plans are disconnected from the actual needs of enterprises. There is a lack of

consensus-based design on teaching goals, contents, and evaluation standards based on the cultivation of the spirit of craftsmanship. Moreover, the absence of stable institutional guarantees and long-term incentive mechanisms makes it hard to create a coherent "teaching-production-cultural immersion" integrated cultivation environment. This superficial integration deprives the cultivation of the spirit of craftsmanship of the practical soil and cultural atmosphere necessary for its growth, and it is difficult to form a collaborative force for the cultivation of the spirit of craftsmanship.

2.4 The Profound Influence of Social Values

The general social values place greater emphasis on academic qualifications rather than skill achievements, and there is a pursuit of "quick success" and "immediate returns", which has led to vocational education being regarded as a secondary choice. The social status and professional dignity of technical-skilled personnel are insufficient, which directly affects students' sense of identity towards their own careers and their determination for long-term commitment. The parent and student groups prioritize "white-collar" positions when choosing careers, and have prejudice against "blue-collar" skill-based positions, believing that they are arduous with low return rates and lack career appeal. This has impacted the quality and stability of the student source. At the same time, in the consumption culture, the pursuit is for "cost-effectiveness" rather than "ultimate quality", which weakens the market's demand and recognition for products that are meticulous and refined. As a result, enterprises lack the internal motivation to continuously improve quality and cultivate artisans. This value deviation that pervades social cognition, educational choices, and market evaluations systematically weakens the social cultural soil on which the artisan spirit relies, reduces the value pursuit of the artisan spirit, and makes it difficult to form a social atmosphere that values skills.

3. The Experience of Modern Apprenticeship in Cultivating the Spirit of Craftsmanship

The modern apprenticeship system should draw on the advanced concepts or experiences from Western countries to cultivate the spirit of craftsmanship. In terms of choosing the experiences, representative countries from various continents such as Europe, America, Asia and Oceania should be selected for reference, including Germany, the United States and Australia, etc.

3.1 German Dual Apprenticeship System

The German dual education system is characterized by "mainly enterprise practice and secondary school education as a supplement". Vocational colleges need to deeply align with the demands of enterprises, integrating real production tasks from enterprises and the requirements of the spirit of craftsmanship into the curriculum design. Students can acquire the strict requirements of the industry during their time at the vocational college, thereby strengthening their practical understanding of the spirit of craftsmanship [5]. At the same time, emphasis is placed on the construction of "dual-qualified" teachers. Vocational college teachers should have work experience in enterprises and enhance their ability to integrate the spirit of craftsmanship into teaching. Additionally, through legislation to clarify the collaborative responsibilities between enterprises and vocational colleges, efforts are made to establish long-term and stable cooperative relationships with enterprises. Joint teaching is carried out by leveraging the high-quality craftsmanship resources of enterprises.

3.2 American Apprenticeship System

The American registration system relies on a unified national registration system, clearly defining the skill standards and professional quality requirements for different occupations. It further breaks down the essence of the craftsmanship spirit into specific indicators for talent cultivation and integrates them into professional teaching standards and assessment systems, ensuring that the cultivation of the craftsmanship spirit is carried out in a systematic manner [6]. At the same time, it emphasizes personalized training, allowing apprentices to convert the relevant achievements of the craftsmanship spirit accumulated in the enterprise into college credits, stimulating students' motivation to actively practice the craftsmanship spirit. The government provides subsidies to support colleges and enterprises in developing modular courses, adjusting the teaching content in accordance with the dynamic changes in industry technologies, so that students can not only master skills but also meet the demands of the industry.

3.3 The New Apprenticeship System in Australia

The new apprenticeship system in Australia is centered on the "National Qualification Framework", integrating professional qualities and the requirements of the artisan spirit into a unified qualification standard, thus avoiding the superficiality of the cultivation of the artisan spirit. At the same time, schools and enterprises collaborate to develop teaching resources, with "industry mentors" and "college teachers" jointly compiling textbooks, converting the growth experiences of artisans into teaching content, allowing students to intuitively perceive the practical value of the artisan spirit in the classroom [7]. Through "flexible learning paths", apprentices can support their learning and practice simultaneously, and allow the achievements of the artisan spirit in the enterprise practice to be included in the academic evaluation, stimulating students' internal motivation to actively inherit the artisan spirit.

4. The Breakthrough Path for Modern Apprenticeship System to Cultivate the Spirit of Craftsmanship

To overcome the current practical difficulties in cultivating the spirit of craftsmanship through modern apprenticeship systems, it is necessary to establish a governance system involving multiple parties - the government, enterprises, educational institutions, and students - to jointly work towards a breakthrough. The government should play a role in policy guidance and resource provision, laying a solid institutional foundation for the training. Enterprises should deeply participate in talent cultivation, providing practical scenarios and resources for craftsmanship. Educational institutions, as the main site of training, need to innovate their teaching systems and models. Students should stimulate their own internal motivation and actively practice the spirit of craftsmanship.

4.1 Government Level

The government should play a role of macro-level coordination and policy guidance. By formulating special development plans and guiding opinions, it should clearly define the cultivation of the spirit of craftsmanship as the core goal of modern apprenticeship system, providing clear reform directions and policy basis for vocational colleges, so that they can follow certain rules in formulating talent training plans, reconfiguring curriculum systems and reforming teaching evaluations. In terms of resource supply, a fiscal special fund should be established. Through diversified incentive methods such as tax preferences and service purchases, it supports vocational colleges and enterprises to jointly build and share training bases, solving the problem of insufficient practical teaching conditions and creating an immersive real production and technological innovation environment for students. At the same time, the government should lead the establishment of a national qualification framework and vocational ability standards, converting the connotation of the spirit of craftsmanship into operational teaching requirements and certification standards, providing a basis for curriculum development, teaching implementation and comprehensive quality evaluation of students. In terms of system design, the legal responsibilities and rights protection of enterprises participating in talent cultivation should be clarified, and a combined incentive system of "finance + fiscal + land + credit" should be established to stimulate the internal driving force of enterprises to deeply participate in school-enterprise cooperation and ensure that vocational colleges obtain continuous and stable cooperation resources and technical support. Finally, the government should also lead the establishment of an evaluation and supervision mechanism centered on the quality of cultivating the spirit of craftsmanship, and incorporate the social status improvement of technical and skilled talents into the national human resource development strategy. Through public opinion guidance and institutionalized commendation and rewards, the social recognition of vocational education should be reshaped, creating a favorable external environment for vocational colleges to attract high-quality students, ensure high-quality employment and development of students, and forming a virtuous cycle ecosystem.

4.2 Enterprise Level

Enterprises should go beyond the shallow cooperation model of merely providing internship positions and truly become the collaborative entities for talent cultivation. They should jointly build an integrated education system that combines "skill imparting and spirit shaping" with vocational schools. Specifically, enterprises should open up real production scenarios, advanced technical equipment, and cutting-edge process standards to vocational schools. They should jointly establish training bases, engineering innovation centers, or skill master studios, and provide immersive practical environments

to enable students to subconsciously understand and internalize the ultimate pursuit of quality, precision, and responsibility. Enterprises should carefully select skilled technicians, rich in experience, and with good professional ethics to serve as enterprise mentors, and conduct systematic training to ensure that the core elements of the craftsmanship spirit, such as the quality culture, innovation spirit, and professional ethics of the enterprise, are effectively passed on to students. Enterprises should deeply participate in the formulation of talent cultivation plans, course development, and teaching standard design, integrating the latest industry technical dynamics, job ability requirements, and corporate core values into the entire teaching process to ensure that the talents cultivated by vocational schools are seamlessly aligned with the needs of enterprises. In addition, enterprises should establish shared evaluation and incentive mechanisms with vocational schools, incorporating professional attitudes, innovation consciousness, and collaboration spirit required by craftsmanship spirit into the assessment standards to stimulate students' intrinsic motivation to hone their skills and cultivate their spirits. Ultimately, enterprises should focus on the long term and view participation in vocational education as a strategic investment to fulfill social responsibilities, reserve high-end technical and skilled talents, and enhance core competitiveness. They should establish long-term, stable, and mutually trusting strategic partnerships with vocational schools and jointly create a craftsmanship growth ecosystem that empowers students for lifelong development.

4.3 Institutional Level

Colleges and universities are the core implementers and system designers of the modern apprenticeship system in cultivating the spirit of craftsmanship. Their breakthrough path lies in conducting a profound self-revolution and systematic reconfiguration. In terms of educational philosophy, they abandon the utilitarian tendency of emphasizing skills over literacy and knowledge over culture, and establish the cultivation of the spirit of craftsmanship as the core goal of talent training, which is integrated throughout the entire process from student recruitment and selection, plan formulation to employment feedback. In terms of curriculum and teaching reform, they actively collaborate with industry and enterprises to jointly develop modular course systems based on work processes, integrating enterprise standards and culture, and highlighting spiritual shaping. They decompose the connotation of the spirit of craftsmanship into specific teaching objectives and activities, achieving the organic integration of technical skills transmission and vocational spirit cultivation. At the teaching implementation level, they vigorously promote project-based teaching, case teaching, and situational teaching, allowing students to experience, comprehend, and practice the spirit of craftsmanship while solving real and complex production problems. At the same time, they strengthen the cultural construction of on-campus training bases and create a campus environment that values skills and respects craftsmen. In terms of the teaching staff, they strive to build "dual-qualified" teaching innovation teams. Through establishing special positions for industry mentors, setting up skill masters' studios, and implementing teacher enterprise practice training systems, they enhance the technical practical ability and educational level of professional teachers, making them role models and disseminators of the spirit of craftsmanship. In addition, they establish a diversified evaluation system oriented towards the cultivation of the spirit of craftsmanship, incorporating students' professional qualities, innovative practices, and labor qualities into the evaluation core, and establishing a graduate follow-up feedback mechanism to continuously improve the talent training work.

4.4 Student Level

The stimulation of students' subjectivity and their internal identification are the ultimate goal and value destination for the successful cultivation of the spirit of craftsmanship in modern apprenticeship systems. It is necessary to guide students to make a fundamental transformation from "passive recipients" to "active constructors". Through systematic design and guidance, it awakens the inner professional identity and spiritual pursuit. It places the enlightenment education of the craftsmanship spirit at the beginning and runs it through the entire process. Through forms such as career introduction, master lectures, enterprise visits, and sharing by outstanding alumni, help students deeply understand the value of technical skills, break the prejudice against "blue-collar" occupations, establish a lofty aspiration of "achieving success through skills and making our country strong", and lay the internal driving force foundation for pursuing excellence. In the practical part, students will be guided by both enterprise mentors and school teachers. Through their complete experience of overcoming technical challenges, repeatedly refining their works, and ultimately creating value, they truly felt the sense of achievement and pride brought by striving for excellence. Thus, they internalized the spirit of craftsmanship from external requirements into stable professional habits and value orientations [8]. At

the same time, we create a strong campus culture atmosphere that respects craftsmen. Through activities such as skill competitions, display of innovative works, and selection of "Skill Stars", students are constantly immersed and inspired in their daily study and life, and a reward mechanism is established that links the manifestation of the spirit of craftsmanship with scholarship evaluation, admission recommendation, and high-quality employment opportunities, strengthening the positive feedback for their continuous practice. Eventually, students can see the broad prospects and diverse paths for skill growth, firmly establish the belief of long-term dedication to the professional technical field and pursuit of the ultimate, and achieve the unity of personal value and social development.

5. Conclusions

The modern apprenticeship system, through the collaborative education between schools and enterprises, combines the real production scenarios of enterprises with theoretical teaching in schools, providing a practical platform for the cultivation of the spirit of craftsmanship. However, in actual operation, there is still a gap between the talent cultivation efficiency and the industrial demands, and it is urgent to explore more effective implementation paths. This study proposes the breakthrough paths for cultivating the spirit of craftsmanship through modern apprenticeship system from "government level, institution level, enterprise level, society level, and student level". It focuses on the "locality" of cultivating the spirit of craftsmanship through modern apprenticeship system, solving the "complexity" of cultivating the spirit of craftsmanship through modern apprenticeship system, and highlighting the "timeliness" of cultivating the spirit of craftsmanship through modern apprenticeship system. It effectively cultivates new era skilled talents, enhances the educational efficiency of vocational colleges, and helps China's economic development enter the quality era.

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