

Guangdong Higher Vocational Colleges and Universities Cultivation of Vocational Skill Talents Practice of Craftsmanship in the New Era

Fei Xu¹, Luanhui Hong^{1,*}, Bin Li²

¹Guangdong Polytechnic of Science and Technology, Zhuhai, Guangdong, China

²School of International Economics and Politics, Liaoning University, Shenyang, Liaoning, China

**Corresponding Author*

Abstract: Vocational education has an irreplaceable mission to cultivate high-quality technical and skilled talents, skilled craftsmen and great national craftsmen. Higher vocational colleges and universities in Guangdong Province have built a trinity cultivation system of "value-competence-practice" through the creation of cultural atmosphere, cultivation by artisan instructors, transformation of competition results, innovation of teaching field, deepening of school-enterprise collaboration and strengthening of guarantee, and realised the transformation from concept to practice for the cultivation of artisan spirit. It has achieved the transformation from concept to practice, and opened up a characteristic road for the cultivation of craftsmanship in vocational education.

Keywords: Craftsmanship in the New Era; Higher Vocational Colleges and Universities; Cultivation of Vocational Skilled Personnel; Guangdong Province

1. Introduction

What is a "craftsman"? There were already documents mentioning this as early as the Warring States Period. What is "gong" (craft)? In Kaogongji-Zongxu (a classic text on craftsmanship from the Warring States Period), it is stated: "The wise create things, the skillful pass them down and preserve them through generations—this is called 'gong'." [1] What is "jiang" (artisan)? In Han Feizi-Wai Chu Shuo You Shang (another work from the Warring States Period), it is written: "A 'jiang' is one with dexterous hands." [2] Craftsmen are artisans who have gained a super-high skill level in a certain field. Sennett believes that craftsmanship involves "the desire to do a job well for its own

sake." [3] Craftsmanship originates from the honour of craftsmen, which is a kind of professional ideal, spirit and cultural characteristics. The good character associated with craftsmanship includes desire for knowledge, concentration, innovation, standardisation, practice, excellence, sense of responsibility, honesty and trustworthiness, division of labour, etc. Craftsmanship can prove the highest level of a country's manufacturing industry. The interpretation of the characteristics of craftsmanship in the new era also embodies humanity's expectations for the future development of industrial technology and the yearning for the all-round and free development of human beings [4]. As a large manufacturing province, innovative province, Guangdong manufacturing value added accounted for more than 34% of GDP, high-end equipment manufacturing, electronic information and other industries are facing the pressure of "neck" technology research, in urgent need of high-skilled personnel to support the industrial upgrading. 2024 Guangdong Province, the public higher education institutions 65, private higher education institutions 27, the number ranks third in the country. The number ranks third in China. Guangdong Province has been focusing on the cultivation of vocational skills in higher vocational colleges and universities, and has implemented a series of initiatives to strengthen the training of skilled personnel. Institutions are closely aligned with the needs of industrial upgrading, deepening the integration of production and education, school-enterprise co-operation, building high-level practical training bases, and implementing "order-type" training and modern apprenticeship system. By promoting the spirit of craftsmanship, integrated into the curriculum teaching and practice, focusing on cultivating students' professionalism,

exquisite skills and sense of innovation, for the construction of a modern industrial system in Guangdong, to achieve the high-quality development of the manufacturing industry a steady flow of high-quality technical and skilled personnel.

2. Publicity and Guidance to Build a Territory-wide Infiltration of Artisan Culture Ecology

Adhering to "Created in China" and cultivating high-skilled talents is of great value and significance to the entire society. However, the lack of social values and cultural atmosphere has made the soil extremely scarce for the idealized practice of talent cultivation to become a reality [5]. All printed material, including text, Guangdong Province has built a territory-wide artisan culture ecosystem through the implementation of the "Enterprise Artisan Culture Week", the creation of the "Southern Guangdong Artisans" documentary film, the Artisan Spirit Exhibition Hall and other initiatives.

2.1 Openness of Enterprises

In the area of enterprise openness, the Guangdong Provincial Government has linked up with the Department of Industry and Information Technology, the Federation of Trade Unions, and the Federation of Industry and Commerce to implement the "Enterprise Craftsmanship Culture Week", and leading enterprises such as the Guangzhou Automobile Group have responded positively by opening up their production lines to higher education students, with the number of students who have participated in this activity in 2023 reaching 47,000 people. This initiative enabled students to observe advanced production processes up close and see for themselves the concentration and exquisite skills of corporate artisans at their posts. On the production line of Guangzhou Automobile Group, students saw the craftsmen striving for excellence in the installation of each auto part, not sparing any minor defects, and deeply experienced the persistent pursuit of details and strict requirements for quality in the spirit of craftsmanship. This field observation allows students to have an intuitive and deep feeling of the spirit of craftsmanship, no longer confined to abstract concepts in books, but can actually understand its concrete embodiment in the actual work, setting a good example for them

to set a good benchmark for their future career positions.

2.2 Publicity and Dissemination

In terms of publicity and dissemination, the Guangdong Provincial Federation of Trade Unions has launched the "Southern Guangdong Craftsmen" learning and publicity activities, and after years of exploration and practice, 110 "Southern Guangdong Craftsmen" have been recommended for learning, and outstanding craftsmen and talents have been selected and recommended for publicity from among the over ten million industrial workers in the province. The first season of the documentary film "Craftsmen of Southern Guangdong", launched in 2022, has gained more than 150 million online media coverage, vividly demonstrating the skills of craftsmen of Southern Guangdong and inspiring more skilled craftsmen with the power of role models to emerge in competition. "Craftsmen of Southern Guangdong" (Season 2) in 2024 has selected "Craftsmen of the Sea", "Craftsmen of Culture", "Craftsmen of Manufacturing Industry", "Project of a Million" and "Green Guangdong". The second season of the programme features the stories of ten representative craftsmen of Southern Guangdong in the themes of "Strong Ocean Province", "Strong Culture Province", "Manufacturing Industry in Charge", "Hundred Million Project", and "Green Guangdong", etc. The programme will record the real faces of their daily work and life, and showcase their high skills and their struggles. For example, Li Zhongqing, the founder of the Dongchao wood carving art school, created a unique 30 to 45 degree angle carving method, integrating the strengths of Dongyang wood carving and Chaozhou wood carving, and his recreation of the "Riverside Scene at Qingming Festival" in Dongyang wood carving made Dongchao wood carving known to the world. The documentary digs deep into their growth history, challenges and breakthroughs in their work, and sees the countless efforts and sweat behind them. Through documentaries, short videos and other forms, the image of these craftsmen has been figuratively spread.

In addition, Guangdong Province also strengthens students' identification with the artisan spirit through innovation in cultural vehicles. On 26 April 2025, the Pearl River Delta Artisan Spirit Exhibition Hall will be officially opened, which is the largest industrial-

themed exhibition hall in Guangdong, and the largest in the country. On display in the exhibition hall are the FAW-Volkswagen Golf anatomical car, the hottest flying machine - the DJI drone, China's first machine reeling machine - the Jichanglong foot-reeling machine, the best of all Olympics - the Beijing Olympic Auspicious Cloud Torch, and the most popular of all Olympics - the Beijing Olympic Auspicious Cloud Torch. -Beijing Olympic torch, South China's largest diameter shield machine - Yue Long nine, five days can scan the Earth once - "Zhuhai One" remote sensing. The museum also features the "Zhuhai-1" remote sensing satellite constellation, which can scan the earth in five days. Each of the exhibits displayed in the Pearl River Delta Artisan Spirit Exhibition Hall is not just an industrial product or a historical relic, but also a concrete incarnation and vivid interpretation of the artisan spirit in different times and fields. Visitors can see, touch and feel these products, which are the result of extreme efforts and wisdom, and thus understand the connotation of craftsmanship more intuitively and deeply. The Lingnan Workshop of the Shunde Institute of Vocational Technology, as an exhibition hall for the spirit of craftsmanship, systematically inherits the local intangible cultural heritage of Shunde, such as Xiangyunsa dyeing and finishing, Canton embroidery, dragon boat making and Lunjiao cake-making, and employs national/provincial intangible heritage inheritors (such as masters of Xiangyunsa and Canton embroidery) to open studios, where the intangible heritage techniques of Canton embroidery and ceramics, as well as the achievements of modern intelligent manufacturing technologies, are on display. as well as the achievements of modern intellectual manufacturing technology. Here, students can not only appreciate the exquisite beauty of traditional non-heritage skills and feel the craftsmanship inherited from their forefathers, but also appreciate the advancement and efficiency of modern intellectual manufacturing technology and experience the inheritance and development of craftsmanship in the new era. The delicacy and concentration between the flying stitches of Canton embroidery artists, the precise grasp of clay and fire by ceramic craftsmen, as well as the pursuit of innovation and efficiency in modern intellectual manufacturing technology, all enable students to understand the connotation of craftsmanship in

an all-round and deeper way, and thus establish a high degree of recognition of craftsmanship deep down in their hearts.

3. Craftsmen Mentors, Dual-Track "Teaching and Learning" Nurturing Mechanisms

Konosuke Matsushita of Japan once said: "With excellent talents, a business will thrive; otherwise, it will decline." [6] In terms of education and teaching in higher vocational colleges, many schools adopt the "double-qualified teacher" training model, which mainly involves sending teachers to practice at the front line of enterprises. This model is single, which can neither meet the needs of teachers' rapid growth nor help teachers cultivate students' application and practical abilities through teaching [7]. Guangdong Province higher vocational colleges and universities have implemented a dual-track "teaching and learning" nurturing mechanism in education and teaching, such as the "dual tutor" mode of school-enterprise collaborative nurturing, the non-genetic inheritance of the living artisan echelon, and the integration of the three types of tutors into the teaching team and other modes, to select outstanding artisans. Mentors set up typical benchmarks of craftsmanship with real stories and personal practice, and build ecological soil for the cultivation of craftsmanship.

3.1 "Dual Mentor" Mode

Shenzhen Information Vocational Technology College adopts the "dual tutor" mode of school-enterprise collaborative education. In the selection of mentors, the college adopts the mechanism of in-depth collaboration between schools and enterprises, multi-dimensional certification of competence, and scenario-oriented practice, focusing on the introduction of technical backbones with cutting-edge technological experience and craftsmanship from leading enterprises in the industry, and realising accurate docking through the carriers of special industrial colleges and order classes. The school has worked with Huawei, Tencent, Shenzhen Kaihong and other head enterprises to develop a mentor competency framework, focusing on technical authority, industrial combat experience and teaching transformation ability, for example, whether the mentor holds top certificates such as HCIE, Open Harmony developer certification, whether he or she has

participated in major projects or technological research, and whether he or she can transform industrial experience into course content. Dynamic grading certification and full-cycle evaluation during the mentor appointment cycle. Mentors are divided into three levels: special technical experts (e.g. Wang Hao, Senior Vice President of Shenzhen Kaihong Digital Industry Development Co., Ltd.), industrial professors (e.g. Huawei senior engineers), and "dual-teacher" teachers (on-campus teachers who have obtained industry certifications). Dynamic assessment is carried out through the three dimensions of "technical contribution + teaching effectiveness + student feedback". For example, tutors at Huawei ICT Academy are required to submit technical service reports on a regular basis and receive anonymous ratings from students. For example, the Shenzhen Information Vocational Technology College and Shenzhen Kaihong Digital Industry Development Co., Ltd. established the Open Source Hongmeng College of Higher Engineers, with the goal of cultivating engineers who master the core technology of domestically produced operating systems. "Dual tutor" is composed of: the enterprise side by the Shenzhen Kaihong six technical backbone as "special technical experts", including Hongmeng system architects, equipment development engineers, responsible for teaching distributed soft bus development, Harmony OS Connect Harmony OS Connect and other cutting-edge courses. The school is 13 full-time teachers to obtain the "open source Harmony education industry experts" certification, and enterprise mentors to jointly design the "Harmony developer certification + enterprise real project" dual-track curriculum system. In the open source Hongmeng Institute of Advanced Engineers, Hongmeng system architects from Shenzhen Kaihong and "dual-teacher" teachers on campus form a teaching team to lead students to participate in real projects such as distributed soft bus development, and in the strict requirements of "every line of code should be able to withstand testing", to convey the message of "not a hair out of place". In the strict requirement of "every line of code should be able to withstand the test", the pursuit of "not a hair out of place" technology is delivered. This mode of "enterprise standards into the campus, real projects into the classroom" allows students to deeply understand the core of craftsmanship "focus on professionalism, the pursuit of

excellence" in the process of docking the industrial frontier.

3.2 The Living Artisan Echelon of Non-Genetic Inheritance

Relying on the advantages of Foshan's manufacturing industry and cultural resources, Shunde Vocational College of Technology has built two national-level skill master studios, six provincial-level skill master studios and 21 school-level skill master studios, which cover a number of non-heritage fields such as Fragrant Cloud Yarn Dyeing and Finishing, Lingnan Bonsai and Canton Embroidery. For example, Liang Zhu, the inheritor of the national Xiang Yunyao dyeing and finishing techniques, set up a studio in the school, teaching students the ancient process of "three steaming, nine boiling and eighteen sun", stressing that "each step of drying should be in line with the weather, and there is no hurry, no speed"; China Bonsai Artists Association Chen Jiajin, vice president of the Chinese Bonsai Artists Association, founded the Lingnan Bonsai Inheritance and Promotion Skills Master Workshop, repeatedly demonstrating the patience of "one cut and ten years of maintenance", so that students can understand that "the spirit of craftsmanship is not achieved overnight, but over a long period of time". These masters not only teach 128 Guangzhou embroidery stitches, Nanshan five-colour pottery glaze proportioning and other technical specifications, but also "choose one thing and spend a lifetime on it", so that students can feel the spiritual core of "focus and perseverance".

3.3 Three Types of Tutors Integrated Teaching Team

Guangzhou Railway Institute of Vocational Technology In response to the stringent requirements for precision in the field of high-end equipment manufacturing, the school has innovated the three types of mentors to collaborate in the education model, and set up an integrated teaching team consisting of "masters + master teachers", "industry mentors + professional leaders", "skilled craftsmen + backbone teachers", and also hired more than 200 highly skilled talents and industry mentors as training lecturers. The school has set up an integrated teaching team consisting of "master + master teacher", "industry mentor + professional leader", "skilled craftsmen + backbone teachers",

and also hired more than 200 industry and enterprise high-skilled personnel and industry mentors to serve as training lecturers. The school has a real "Fuxing" train for practical training, and the enterprise instructors carry out teaching with the real failure cases of "Fuxing", which provides strong talent support for the high-end equipment manufacturing industry in Guangdong, Hong Kong and Macao Greater Bay Area. Ding Fei, winner of the 2022 National May 1st Labour Medal at Guangzhou South Railway Station, Xie Dongtian, winner of the 2012 National May 1st Labour Medal at Shenzhen Metro Group, winner of the 2014 Train Leader Medal at Guangzhou Railway Group, and Xie Dongtian, winner of the 2012 National May 1st Labour Medal at Shenzhen Metro Group, were all awarded the "Train Leader Medal" by Guangzhou South Railway Group. Wu Huachuang, winner of "Train Leader Medal", Lai Zetuan, winner of "National Railway Model Worker" of Guangzhou Railway Group in 2014, Hong Ocean, railway craftsman of China Railway Corporation and professional leader of the project of millions of talents, and Lin Zhanxiong, winner of China Vocational Skills Competition in 2019 are all excellent students cultivated by Guangzhou Railway Institute of Vocational Technology. Railway Vocational and Technical College cultivated outstanding alumni. Guangzhou Railway Vocational and Technical College takes "alumni role models" as implicit evaluation, and their experience of "sticking to the high-speed railway maintenance post for 20 years and treating every inspection as the first time" makes students intuitively feel that the craftsmanship spirit is not in the faraway place, but in the day-to-day. The students can intuitively feel that craftsmanship is not far away, but in the day-to-day perseverance. There is no fixed pattern for the cultivation of craftsmanship, but there is a common logic: to build "real soil" by school-enterprise co-operation, so that students can understand the value of craftsmanship in docking the industry; to transfer "spiritual gene" by masters' leadership, so that students can feel the value of "choosing one thing will last for a lifetime" in the eyes and ears. "Choose one thing and end up in life" meaning; to the actual quenching and refining "professional sinews", so that students in the problem-solving practice "excellence" guidelines; to evaluate the incentive to cultivate the "growth ecology". "Growth ecology", so that students in

the continuous progress of precipitation "the pursuit of excellence" consciousness.

4. Competition Driven, Competition Results Transformation

In the field of vocational education, the cultivation of craftsmanship not only requires classroom teaching and practical exercises, but also requires the construction of a high-level competitive platform, which is driven by competitions to stimulate students' endogenous motivation to pursue excellence. Through participating in the training process, live competitions, and reviewing the results of various skills competitions, students can experience the hardships of training and the glory of achievements of the competitors around them [8]. Higher vocational colleges and universities in Guangdong Province have built a four-level skills competition chain of "school-provincial-national-world", which is deeply aligned with the standards of the World Skills Competition, and deeply integrates skills competitions with the cultivation of craftsmanship, not only achieving breakthroughs in the competition results, but also transforming craftsmanship through achievements. This has not only achieved a breakthrough in competition results, but also transformed the spirit of craftsmanship into real productivity to promote industrial development through the transformation of results, and has come out with a unique path of educating people.

The four-tier skills competition system built in Guangdong Province guides students to refine their craftsmanship through progressive challenges. School-level competitions serve as a starting point to stimulate students' enthusiasm for participation and cultivate their basic skills; provincial-level competitions further raise the difficulty level, allowing students to broaden their horizons in regional competitions; and national and world-level competitions are benchmarked against the industry's highest standards, prompting students to launch an assault on the "ultimate". In this process, students need to go through day after day of hard training, constantly polishing technical details, this "one minute on the stage, ten years of work under the stage" persistence, which is the spirit of craftsmanship in the "focus and persistence" of the vivid embodiment. Guangdong Province in the World Skills Competition CNC milling project to achieve the gold medal "three

consecutive championships", behind these achievements, is the countless students and instructors to strive for excellence in the attitude of each processing parameters, each operation process repeatedly, and strive for perfect results. They not only improved their skills in the competition, but also integrated the spirit of pursuing excellence into their professional character.

4.1 The Competition Proposition Closely Matches the Real Issues of the Enterprise

The transformation of competition results extends the spirit of craftsmanship from the field of competition to the front line of industry. Guangdong Province higher vocational colleges and universities will the competition proposition is closely related to the real topics of enterprises, so that students can directly face the pain points and technical problems of the industry. After the students submit the programme, the enterprise mentor with rich practical experience to optimize, so that the technical programme is more practical and feasible. Subsequently, the innovation results will be declared patents, and ultimately applied to the enterprise production line, realising the leap from creativity to products. Shunde Vocational College of Technology's "3D Vision Robot Security System" project won the second prize in the 2024 National Artificial Intelligence Application Scenario Innovation Challenge. The system integrates Kuka robots, RGBD sensors and self-developed algorithms to realise real-time security protection for industrial robots in the working area. It has been applied in a pilot project in an auto parts factory in Foshan, successfully reducing the rate of collision accidents by 92% and unplanned equipment downtime by 40%. The enterprise said that the deployment of the system has increased the comprehensive efficiency of the production line by 18%, and is negotiating a bulk purchase agreement. The "Lightweight AI Insect Detection and Reporting Equipment" developed by a team of students from Guangdong Light Industry Vocational and Technical University won the gold medal in the "Internet+" competition. The device accurately analyses the types of pests and diseases through image recognition technology, and generates medication recommendations in combination with the growth stage of crops. It has been promoted in 700 acres of citrus planting areas in

Deqing County, Zhaoqing, reducing pesticide use by 30% and achieving a 98.7% accuracy rate in pest identification. Pilot data show that the application area citrus yield increased by 15%, increasing income by more than 2,000 yuan per acre. The project team is working with the Wensley Group and plans to expand the technology to the field of poultry farming. Behind these results, the students' relentless pursuit of technological innovation and the strict quality control by the enterprise mentors are united, which is a perfect interpretation of craftsmanship in the field of technology development and application. Students in this process deeply appreciate that the spirit of craftsmanship is not only the refinement of existing technology, but also the brave exploration of innovative breakthroughs.

4.2 Clear Policy Guidance, Rich Competition Results and Strong Enterprise Participation

The Department of Education of Guangdong Province has issued the "Implementation Opinions on Credit Recognition and Conversion Work in Higher Education", which explicitly incorporates the award-winning achievements of skills competitions into the credit conversion system. Guangzhou Railway Institute of Vocational Technology's "Credit Recognition and Replacement Management Measures (for Trial Implementation)" clearly stipulates that students can obtain credits through participation in innovation and entrepreneurship, science and technology competitions and other activities, and can replace some of the course credits. For example, students who have won awards from provincial-level or above competitions can apply for exemptions from relevant professional courses and get credits directly. Students of the university have won more than 500 awards at the provincial level or above in the past five years, including four second prizes at the national level in the National Vocational College Skills Competition, showing active competition activities and remarkable results.

On 28 June 2023, the Guangdong Provincial Department of Human Resources and Social Welfare held a docking activity for the construction of skills ecological chain of "production, education and evaluation", making it clear that 63 skills ecological chains have been formed, attracting the participation of 3,170 eco-enterprises and 432 colleges and universities. In the activity, Huawei, Kingdee joint institutions

to promote the integration of Hongmeng ecological, Cangdao low-code technology ecology and talent training, Tencent, Jingdong and other enterprises to participate in the construction of training bases. Formation of "competition-R&D-application" closed loop. Higher vocational colleges and universities in Guangdong Province have made skills competitions an important carrier for the cultivation of craftsmanship through the model of "competition-driven growth and transformation of competition results". In this process, students refine their skills and mould their character on the stage of the competition, and realise their value and contribute to the society in the practice of transforming their achievements. This nurturing mode of integrating craftsmanship into the whole process of competition and production not only lays a solid foundation for the career development of students, but also provides a strong talent support for the upgrading of regional industries, and provides valuable experience for the high-quality development of vocational education.

5. Teaching Factory, the Implicit Function of Real-life Teaching Realisation

In the field of vocational education, the cultivation of craftsmanship not only requires theoretical inculcation, but also relies on practical immersion in real scenarios. In terms of teaching models, some higher vocational colleges still adopt traditional teaching models in the cultivation of skilled talents. Theoretical teaching accounts for a large proportion, while practical teaching is neglected. Some colleges do not attach enough importance to internships and practical training, and fail to make full use of school-enterprise cooperation platforms to enhance students' practical abilities [9]. As an innovative mode of vocational education reform, the teaching factory realises the deep penetration of the cultivation of craftsmanship in a full-fledged production environment. From the traditional classroom to the teaching factory 1.0-2.0 era, the iterative upgrading of the educational scene has transformed the cultivation of craftsmanship from an abstract concept into a perceivable and practicable vocational quality.

5.1 Traditional Teaching Mode and Teaching Factory 1.0

Under the traditional teaching mode, the classroom is teacher-centred, and the

transmission of knowledge and skills is characterised by one-way output. Teachers transfer knowledge and experience to students through theoretical explanations and skill demonstrations, but due to the lack of support from real work scenarios, students' understanding of craftsmanship often stays at the literal level.

Entering the era of Teaching Factory 1.0, a consistent operating environment with enterprises has been established, and the alternating mode of work and study has been introduced into the simulation training, which provides students with preliminary practical experience through modular training and guidance by both on- and off-campus teachers, but there is still a gap between the simulation scenario and the real production, and the "striving for perfection" and "dedication and persistence" of the spirit of craftsmanship are still in the background. However, there is still a gap between the simulation scene and the real production, which makes it difficult for students to fully experience the qualities of craftsmanship such as "striving for perfection" and "dedication".

5.2 Teaching Factory 2.0

Entering the era of Teaching Factory 2.0, vocational education has ushered in a qualitative leap. Teaching activities are no longer limited to simulation scenes, but in the real production environment, around the real orders of enterprises to start, the orders of enterprises into teaching projects, students are no longer passive recipients of knowledge, but transformed into an independent manager of production tasks, this change provides fertile soil for the cultivation of the spirit of craftsmanship. Take the "Industry 4.0 Demonstration Factory Project" of Shunde Institute of Vocational Technology as an example, Shunde Institute of Vocational Technology cooperates with Guangdong - Aachen Industry 4.0 Application Research Centre and Guangdong Midea Kitchen Appliance Manufacturing Co. Shunde Institute of Vocational Technology and RWTH Aachen University jointly assessed the selected personnel stationed in the research centre to carry out various research and implementation work, with the goal of improving real factories with new industrial technologies, exploring the reconstruction of the existing product quality, process optimization, logistics system, automation technology, manufacturing

management mode, etc. based on the Internet of Things, big data, robotics and other technologies, with a view to realizing the automation of the production process, manufacturing, flexibility, data platform collaboration and so on. Flexibility, data platform synergistic organic unity, comprehensively improve enterprise product quality and production efficiency, reduce operating and management costs, and form incubation output in home appliance manufacturing, machinery manufacturing, electronics assembly and other major support industries in Shunde can be replicated, can be promoted in the industrial business solutions, as well as the professional talent team, in order to support and drive the Shunde industrial upgrading and transformation of the development strategy. Liu Hui, director of manufacturing centre of Midea's micro-clearing division, said, "The demonstration factory will achieve an increase of more than 25% in the production efficiency of the automatic line after completion, and at the same time cultivate a professional team of technical application to solve the common and individual problems in the process of intelligent manufacturing." By introducing the real production line of Midea's kitchen, the classroom is moved directly into the production workshop. Students work in small groups to contract the production tasks of the module, and participate in the real production process from raw material procurement, production and processing to quality testing. In this process, the cultivation of craftsmanship is carried out throughout. Facing the strict quality standards of enterprises, students must treat every production link with a high sense of responsibility. What students gain is not only the improvement of skills, but also a deep understanding of the craftsmanship spirit of "striving for excellence". In the process of self-management, students need to independently solve all kinds of problems in production, such as equipment failure, process optimisation, etc., which cultivates their spirit of concentration and the courage to overcome difficulties. At the same time, the teamwork mode of the production tasks also allows students to learn to take responsibility and tacit co-operation, which is an indispensable professional quality in the spirit of craftsmanship. This kind of craftsmanship sharpened in the field is far more contagious and long-lasting than lectures in the classroom. The Teaching Factory 2.0, as an innovative

model of real-life teaching, realises the implicit function of craftsmanship cultivation through the real production environment, the self-managed teaching mode and the quality requirements of enterprise standards. In the process of practical participation, cultivating the "craftsman spirit" is of more practical significance and serves as a more effective integrated approach[10]. It allows students to internalise the spirit of craftsmanship into their own professional beliefs and code of conduct in the process of solving practical problems, lays a solid foundation for the cultivation of high-quality technical and skilled talents adapted to the needs of modern industries, and also explores a practical and feasible practical path for the cultivation of the spirit of craftsmanship in vocational education.

6. School-enterprise Linkage and Creation of the Bay Area Industry-Education Integration Community

The cultivation of craftsmanship cannot be separated from the in-depth integration of industry and education. Through the creation of the "Bay Area Industry-Education Integration Community", Guangdong Province has built up an innovative system of collaborative education between enterprises and institutions, and has integrated the cultivation of craftsmanship throughout the whole process of talent cultivation, so as to cultivate high-quality skilled talents with exquisite skills and professional ethics for the industrial development of Guangdong, Hong Kong and Macao Greater Bay Area.

6.1 Bay Area Industry-Education Integration Community

On 28 January 2024, the Intelligent Construction Industry-Education Integration Community of the Guangdong-Hong Kong-Macao Greater Bay Area was formally established, led by the Guangdong Provincial Academy of Building Research Group, South China University of Technology and Guangzhou Urban Construction Vocational College, with the joint efforts of 58 industry associations, tertiary institutes, vocational schools, scientific research institutes, and enterprises and institutions, such as China (Shenzhen) Education Group Company Limited and Hong Kong Si-Sheng Holding Company Limited. Formation of Guangdong, Hong Kong and Macao Greater Bay Area Intelligent Construction Industry and Education Integration

Community. The Community focuses on the development trend and demand of the intelligent construction industry, insists on promoting industry with education, assisting education with industry, in-depth integration of industry and education, and efficient docking of services, supports the cross-regional integration and development of the intelligent construction industry in Guangdong, Hong Kong and Macao Bay Area, gives full play to the roles of the government, industry aggregation, enterprise pulling and the main body of the school, and creates a comprehensive mechanism that integrates the leadership of industrial innovation, the synergistic development of teaching and research, and the cultivation of talents and exchange of technology. Mechanism.

On 6 December 2024, the Guangdong-Hong Kong-Macao Greater Bay Area Modern Service Industry and Education Integration Community was established, which is jointly led by four units, including Guangdong Light Industry Vocational and Technical University, Guangdong Tourism Holding Group Company Limited, Sun Yat-sen University and Guangzhou Tourism and Business Vocational School, and more than 180 units to form an all-industry, cross-region Industry and Education Integration Community to empower the high-quality development of the modern service industry in the Guangdong-Hong Kong-Macao Greater Bay Area. The Community will be led by 4 units of Guangdong-Hong Kong-Macao Greater Bay Area. The establishment of the Guangdong, Hong Kong and Macao Bay Area Modern Service Industry Industry and Education Integration Community is an opportunity to further deepen the cooperation with enterprises, strengthen the linkage with colleges and universities, promote the in-depth integration of vocational education and industrial development, and contribute wisdom and strength to the development of the modern service industry in the Greater Bay Area.

Through the construction of the "Bay Area Industry-Education Integration Community", Guangdong Province has taken a series of initiatives in the formulation of talent cultivation standards, innovation of cultivation modes, and expansion of practice platforms, etc., and has put the cultivation of craftsmanship throughout the whole process of vocational education, and built up a bridge to accurately connect vocational education with industrial needs. This in-depth

industry-education integration model of nurturing not only provides students with quality learning and practice opportunities, but also injects a strong talent impetus for the development of industries in Guangdong, Hong Kong and Macao Bay Area, and moreover provides a successful experience that can be learnt from for the cultivation of craftsmanship in vocational education in the new era.

6.2 Community of Industry-Education Integration and Platform of Industry-Teaching-Science Integration

In Guangzhou Railway Institute of Vocational Technology, the school aims at the key field of rail transport signal control safety, focuses on intelligent monitoring, intelligent operation and maintenance, intelligent safety warning and other "neck" technologies, and jointly initiates the establishment of the National Rail Transport Safety Control Industry-Education Fusion Community together with Beijing All-Road Communication and Signal Research and Design Institute Group Co. On 11 September 2024, the inaugural meeting of the Community was held in Beijing. The first batch of member units covers 21 provinces (autonomous regions and municipalities directly under the central government) in China, including 9 general colleges and universities, 42 vocational colleges and universities, 4 industrial organisations and scientific research institutes, and 25 upstream and downstream enterprises in the industry.

Guangzhou Panyu Institute of Vocational Technology and Guangzhou CNC Equipment Co., Ltd. and Guangzhou Industrial Investment Holding Group Co., Ltd. and other chain enterprises led the establishment of Guangzhou Intelligent Equipment Manufacturing Industry and Education Consortium, the National Industrial New Materials Industry and Education Integration Community and other high-quality industry-teaching and fusion platforms, relying on the operation of the seven physical provincial demonstration industry colleges, the formation of cross-border mixed technology innovation team of 32, and the collaborative development of scientific research, technology research, results transformation and talent training.

The establishment of the Community of Industry-Education Integration and the Platform of Industry-Teaching-Science Integration has made it possible to expand the functions of the platform of school-enterprise co-operation, and

provided diversified practice carriers for the cultivation of craftsmanship. In the process of solving problems, teachers and students need to consult a large amount of information, conduct repeated tests and optimisation, which cultivates their innovative spirit of courageous exploration and overcoming difficulties, as well as the persistent pursuit of technology, and this extreme pursuit of product quality is precisely an extension of the spirit of craftsmanship in the field of innovation and entrepreneurship.

7. Policy Support, All-round Enhancement of the Sense of Access and Identity of Artisanal Talents

The cultivation of craftsmanship not only requires deep cultivation of education practice, but also relies on the strong support of the policy system. Guangdong Province has guided enterprises to change from "employers" to "educators" through policies such as tax credits for enterprises that support the integration of industry and education and housing for craftsmen, so that the spirit of craftsmanship grows naturally in real production scenarios and skilled talents can firmly pursue their careers in social recognition and protection. At the same time, skilled talents can firmly pursue their careers with social recognition and protection, forming a virtuous cycle of "policy incentives - enterprise participation - talent growth".

7.1 Tax Credits

The tax credit policy provides enterprises with incentives to participate in the cultivation of craftsmanship. In 2021, Guangdong Province adopted the "Guangdong Pilot Implementation Plan for the Construction of Industry-Education Integration", and in 2022, five departments, including the Guangdong Provincial Department of Human Resources and Social Security, jointly issued the "Implementation Plan for the Comprehensive Implementation of the New Type of Enterprises with Chinese Characteristics on the Promotion of Craftsmanship". Notice on Strengthening Skilled Personnel Cultivation by Comprehensively Implementing a New Type of Apprenticeship System for Enterprises with Chinese Characteristics", which explicitly includes enterprises integrating production and education in the scope of apprenticeship pilots, and mentions that "the pilot enterprises will be jointly selected by the province and the city". In addition, the fourth batch of pilot notices on the

construction and cultivation of industry-teaching-integrated enterprises issued by Shenzhen 2025 further refined the certification process and standards, indirectly reflecting the policy framework at the provincial level. As of 2023, Guangdong Province has cultivated 1,223 industry-education integration-type enterprises, covering key areas such as intelligent manufacturing, new-generation information technology, and modern agriculture. For example, enterprises such as Shenzhen Sanno Group and Guangdong Haida Group have integrated the cultivation of craftsmanship into production practice through school-enterprise co-operation in building training bases and carrying out apprenticeship training. This mode of "enterprise standards into the campus, artisan experience into the classroom" allows students to intuitively feel the connotation of "focus, precision, perseverance" in the process of docking the real needs of the industry, which is far more penetrating than textbook lectures.

According to the Notice on Adjusting the Policies Related to Some Government Funds issued by the Ministry of Finance and the General Administration of Taxation in 2019, pilot enterprises included in the scope of cultivation for the construction of industry-education-integrated enterprises can offset 30 per cent of the investment amount against the education surcharge and local education surcharge payable for the year. The policy has been implemented since 1 January 2019 and is valid until 31 December 2024. The official website of the Guangdong Provincial Taxation Bureau clearly lists this policy as one of the important initiatives of "tax support for high-quality development in Guangdong". For example, the Zhaoqing Municipal People's Government reiterated the 30 per cent credit ratio when it forwarded the notice in 2023. In addition, the 2019 Guangdong Province Work Plan for Building and Cultivating Industry-Education Integration Enterprises also explicitly mentions that enterprises entering the certification catalogue can enjoy "a 30% credit of the investment amount for education surcharges and local education surcharges". The tax credit policy stimulates the enthusiasm of enterprises to participate in the cultivation of craftsmanship. Certified enterprises can offset up to 30 per cent of their investment in education surcharges and local education surcharges payable in the current year. This policy dividend

has attracted leading enterprises such as Huawei and Gree to deeply participate in vocational education. Enterprises not only integrate production standards and technical specifications into the institutional curriculum, but also select technical backbone as enterprise mentors to pass on their own pursuit of excellence in craftsmanship to students. For example, under the guidance of enterprise mentors, students come into contact with cutting-edge technology and strict quality control processes in practical training, and deeply understand the craftsmanship concept of "product is human character". The tax incentives have transformed enterprises from bystanders to in-depth participants in vocational education, realised the precise docking between enterprise demand and vocational education supply, and allowed the artisan spirit to be inherited and carried forward in the practice of industry-teaching integration.

7.2 Housing and Settlement Policy for Craftsmen

A stable living environment not only guarantees the quality of life of talents, but also creates a community atmosphere that admires skills and respects craftsmen, and promotes the spread of the craftsman spirit in daily life. Guangdong Province has enhanced the sense of access and recognition of artisanal talents from the dimensions of guaranteed housing and secure living. The Measures for the Administration of Guangzhou Municipality's Allocated Guaranteed Housing (for Trial Implementation) include highly skilled talents in the coverage of the guaranteed housing policy. According to the Measures, if a talent family submits an application, the main applicant should have conditions such as senior worker and above vocational skill level certificate, and all family members of the applicant should have no own property rights housing in the city and no record of transferring own property rights housing in the city within 3 years before the application, and the main applicant and spouse do not enjoy preferential policies on home purchase in the city. Talent families are not subject to the age limit of household registration and single applicants, while shortening the number of years of social security requirements. Shenzhen Talent Settlement Measures" applies to the settlement activities for all kinds of talents in need of economic and social development in the city, and the settlement methods include in-kind

allocation and monetary subsidies, and the in-kind allocation includes rent-free renting, renting public housing and purchasing settled commercial housing, etc. Highly skilled talents who meet the relevant talent identification standards can enjoy the corresponding settlement policies according to these Measures.

The above tax credits and housing protection policies not only motivate enterprises to increase investment in vocational education, but also allow students to see the value of craftsmanship in market competition, enhance their sense of identity and pride in their profession, so that craftsmen can focus on technical research and craftsmanship training.

Through systematic policy innovation, Guangdong Province has built up an ecology for the cultivation of craftsmanship that covers the entire chain of vocational education and society as a whole. From the incentives for talent cultivation in institutions to the empowerment of enterprises in the integration of industry and education, to the respect of society for craftsmen, these policy initiatives synergise with each other to form a strong policy synergy. They not only provide a solid guarantee for the high-quality development of vocational education, but also create a strong atmosphere of respect for labour, skills and the pursuit of excellence in the whole society, so that the spirit of craftsmanship can flourish in the new era and provide a steady flow of talents for the upgrading of industries and high-quality development of the economy in the Guangdong-Hong Kong-Macao Greater Bay Area.

8. Conclusion

In this era, vocational education has an irreplaceable mission to cultivate high-quality technical and skilled talents, skilled craftsmen and great master craftsmen. Higher vocational colleges and universities in Guangdong Province can realise the cultivation of craftsmanship from the closed-loop system of "cultural infiltration - craftsman tutor - competition drive - field reconstruction - school-enterprise linkage - system guarantee". system, the cultivation of craftsmanship is transformed from concept to practice. In order to better cultivate students' craftsmanship, Guangdong Province has been actively exploring and taking multiple measures to carry out fruitful practices in various aspects, which has opened up a characteristic path for the cultivation of craftsmanship in vocational

education.

Acknowledgments

This paper is supported by Guangdong Provincial Education and Scientific Research Project (Higher Education Scientific Research Special Topic) "Research on Evaluation Index System and Measurement of Craftsman Spirit of Vocational Skills Talents in Guangdong Vocational Colleges Based on PLS-SEM Model" (No. 2024GXJK1076).

References

- [1] Wen Renjun. Annotation and Translation of Kaogongji. Shanghai: Shanghai Classics Publishing House, 2021: 1.
- [2] Chen Qiyou (collation and annotation). New Collation and Annotation of Han Feizi. Shanghai: Shanghai Classics Publishing House, 2000: 781.
- [3] Sennett Richard. The Craftsman. New Haven: Yale University Press, 2008.
- [4] HOU Tianshu, CHEN Hongbing. The Truth, Good, and Beauty of the Craftsman Spirit in the New Era. Philosophy Study, September 2022, Vol. 12, No. 9, 506-510.
- [5] Qing He. The Realistic Predicament of the "Spirit of the Craftsman" in Higher Vocational Education. 4th International Conference on Education, Management and Computing Technology (ICEMCT 2017) Advances in Social Science, Education and Humanities Research, volume 101: 402-406.
- [6] Jiang Wei. The Philosophy of Craftsmen: Business Principles of Japan's Four Great Business Sages. China Overseas Chinese Publishing House, 2017: 279.
- [7] Yang Lichao, Li Hanlin. Paths for the Construction of "Dual-Qualified" Teacher Teams in Colleges and Universities Under the Guidance of Craftsman Spirit. Journal of Jilin Provincial Institute of Education, 2024(05): 91-95.
- [8] Wu Suxia. An Analysis of the Cultivation of Craftsman Spirit Among Vocational College Students in the New Era. Research on Ideological and Theoretical Education, 2022 (4): 110-117.
- [9] Xie Jinghua. A Study on the Value Orientation of Craftsman Spirit in the Cultivation of Skilled Talents in Colleges and Universities. Shaanxi Education (Higher Education), 2024(05): 64-66.
- [10] Xiuxiang Chen. Analysis of the Motivation of the Integration of Craftsman Spirit and Ideological and Political Education of College Students. International Journal of Trend in Innovative Research, Volume 4, 2022: 15-17.