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Construction of School-Enterprise Community Education Model for Software Technology Specialty Driven by Information Technology Application Innovation Industry: Taking Shanwei Institute of Technology as an Example

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Abstract: The software technology field is facing new talent demands brought by the Information Technology Application Innovation (ITAI) industry. This paper takes Shanwei Institute of Technology as an example to deeply explore the construction of a school-enterprise community education model driven by the ITAI industry. It establishes the Kirin Workshop training base to facilitate talent cultivation, integrates the ITAI Application Adaptation Center to enhance technical capabilities, cooperates with Liqi Technology to establish an industrial college for government talent training, adjusts the professional curriculum system, and arranges for students to participate in ITAI vocational skills competitions. The school-enterprise collaborative cultivation mechanism meets the talent needs of the ITAI field, with effective practical results. This paper also points out the shortcomings of the school-enterprise collaborative education model in the ITAI industry and provides optimization methods to explore new paths for industry-education integration and serve the development of regional and national ITAI industries [1].

Keywords: Information Technology Application Innovation (ITAI) industry; School-enterprise cooperation; Education model; Software technology specialty

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1. Introduction

The Information Technology Application Innovation (ITAI) industry, as a national strategic pillar, plays a decisive role in maintaining data security and promoting economic structure optimization. With the rapid rise of the ITAI industry, there is a talent gap in software technology based on ITAI, and the application ability of domestic operating systems has become an industry necessity. The operation and deployment capabilities of independent platforms such as the Kirin system have become essential qualities for software engineers, and software developers must possess professional knowledge of ITAI adaptation applications [1].

As a key place for talent cultivation, how colleges and universities can closely connect with the needs of the ITAI industry and innovate talent cultivation methods has become an urgent problem to be solved. Shanwei Institute of Technology has actively adapted to the development trend of the ITAI industry, deeply cooperated with enterprises, and explored the construction of a characteristic school-enterprise community education model [2,3], cultivating a large number of high-quality technical and skilled talents for the ITAI industry.

2. Specific construction strategies of school-enterprise community education model

2.1. Clarifying the goals and positioning of school-enterprise cooperative education

Goal setting: Based on the development needs of the ITAI industry, the goal is to cultivate high-quality technical and skilled talents with solid professional knowledge of software technology, proficient mastery of ITAI application skills, and an innovative and team collaboration spirit. The school-enterprise collaborative cultivation mechanism improves students' ability to adapt to ITAI industry positions and solves technical problems in enterprise production processes, providing long-term support for students' career development.

Relying on regional resource advantages, the college taps into key fields such as government affairs, finance, and energy, focuses on cultivating software technology talents adapted to the needs of local ITAI industries, focuses on building a domestic operating system ecosystem, cultivates ITAI talents with local characteristics, and establishes talent channels with industry partners.

2.2. Building a dual-subject collaborative education model

Colleges and enterprises, as the dual subjects of school-enterprise cooperation, jointly participate in the entire process of talent cultivation. The college is responsible for the teaching of basic theory and professional courses, while the enterprise provides practical venues, project cases, and technical guidance. The two parties cooperate to promote the implementation of project practice and job practice teaching links. Based on local job needs and ITAI technical standards, enterprises participate in formulating teaching documents such as talent training programs, course outlines, and assessment standards, achieving in-depth integration of college teaching and enterprise production practice and improving the pertinence and effectiveness of talent cultivation [4].

2.3. Constructing a school-enterprise collaborative education mechanism: Cultivating ITAI application adaptation talents with Kirin Software Enterprise

In 2023, Shanwei Institute of Technology was successfully selected for the second batch of "Kirin Workshop" Campus Practical Training Base construction projects. The platform enables software technology students to directly contact leading domestic operating system enterprises. Kirin Software Company builds a bridge for practical teaching for students. The college and Kirin Software have cooperated to establish a training base, providing students with opportunities to access the latest technologies of domestic operating systems. Students can carry out practical operations such as operating system installation and configuration, database management and maintenance, and ITAI application development in the Campus Practical Training Base, experiencing the practical application of ITAI technologies firsthand and improving their practical and innovative abilities.

In 2024, the college and Kirin Software Company jointly built the ITAI Application Adaptation Center project. After installing the Kirin system in the training room, the teaching practice of the domestic operating system platform was successfully carried out, which created conditions for the adaptation of ITAI courses and substantially expanded teaching resources. The project implemented ITAI professional skills training for 100 teachers and students, among whom two teachers obtained the qualification of senior lecturers in Kirin

operating systems and became teaching backbones. Cutting-edge ITAI field expertise is gradually being taught to more students, significantly improving the college's teaching capabilities, and the teaching staff continues to grow in the knowledge transfer process, with a substantial improvement in teaching standards.

2.4. Constructing a school-enterprise collaborative education mechanism: Establishing an industrial college with Liqi Technology Co., Ltd. to cultivate government affairs talents

Liqi Technology is a well-known enterprise in government affairs informatization. Shanwei Polytechnic and Liqi Technology have jointly built an industrial college, enabling students to directly contact enterprise operations and grasp the latest industry trends. Students engage in government system internship activities, directly operating domestic software to handle daily affairs, and the actual use of various management systems in the government office process fully demonstrates the functional advantages of software. Such personal experience enables users to have an intuitive understanding of the characteristics of domestic products, significantly improves students' sense of belonging to the ITAI industry, and significantly enhances their professional identity. This training model creates favorable conditions for graduates to enter related fields, accumulates valuable practical experience, and broadens employment channels [5].

2.5. Enterprise participation in optimizing the curriculum setting of software technology specialty

To meet the development needs of the ITAI industry, enterprises, together with teachers and experts from the software technology professional group, have optimized and adjusted the curriculum setting of the software technology specialty. The curriculum framework has added innovative modules, and new courses such as Kirin system operation practice and domestic software application have been incorporated into the teaching plan. The arrangement of courses enables students to gradually master key ITAI technologies, from domestic operating systems to software development based on domestic software, forming a complete knowledge architecture system, significantly broadening career development paths, and fully meeting enterprises' demand for professional talents in the ITAI field.

According to the technical development trends of the ITAI industry and actual enterprise needs, timely update the content of the curriculum teaching, incorporate real enterprise cases into classroom teaching, and adopt a project-oriented approach. Students learn the latest ITAI technologies through practical operations and cultivate problem-solving skills. On the other hand, invite enterprise technical experts to participate in the revision and improvement of the curriculum teaching content to ensure that the teaching content meets the enterprise's job skill requirements, allowing students to apply the knowledge they have learned directly to enterprise production practices.

2.6. Strengthening the construction of teaching staff

Colleges regularly arrange professional teachers to participate in special training, industry summits, and technical salons in the field of information technology application innovation. These professional activities effectively broaden the cognitive boundaries of the teaching staff, enabling teachers to better master cutting-edge teaching methods and ITAI technologies.

Professional teachers take the initiative to connect with industry experts to carry out in-depth discussions on ITAI talent cultivation. The two parties can spark ideological sparks through case discussions, experience sharing, and other forms. This interactive mechanism more powerfully promotes the continuous optimization of

the teaching team's professional capabilities.

2.7. Innovating teaching methods and means

Bringing real ITAI enterprise projects into the classroom: Real projects are introduced into the classroom, and ITAI projects become teaching carriers, putting real work situations into classroom teaching and promoting the organic integration of the teaching process and project implementation. In teaching practice, students analyze actual project cases under the guidance of teachers and gradually master practical experience in the ITAI field through discussion. The application of the real project teaching method fully mobilizes students' curiosity, significantly improves classroom participation, increases teacher-student interaction, significantly improves the efficiency of knowledge absorption and professional knowledge conversion, and enables organic integration of theoretical cognition and practical operation. Students' innovative awareness and independent thinking abilities are exercised [6].

Virtual simulation teaching method: Using virtual simulation technology, build an ITAI virtual simulation teaching platform to simulate the practical situations of domestic operating system installation, configuration, operation and maintenance, and application software development and adaptation. The virtual simulation platform helps learners safely acquire practical skills, eliminating equipment loss and data risks, with no restrictions on practice times, full knowledge of operation steps, and gradual improvement of practical abilities. Virtual simulation technology transforms traditional teaching models, effectively managing practice costs while improving teaching results and safety levels.

Online-offline hybrid teaching method: Integrating the advantages of online teaching resources and offline classroom teaching, adopting an online-offline hybrid teaching model. Teachers upload ITAI-related teaching videos, courseware, cases, and other learning resources through the Superstar Learning online teaching platform, and students can self-study basic content and theoretical knowledge online. In the classroom, teachers focus on analyzing difficult knowledge, students complete practical operations independently, and discussions, exchanges, and question answering are carried out together. Relying on the organic combination of online and offline teaching, realize the sharing of teaching resources and the optimization of the teaching process, and improve students' learning effects and experiences.

2.8. Promoting learning through competitions and actively participating in ITAI vocational skills competitions to win awards

In the past two years, the college has actively organized students to participate in competitions such as the "Vocational Skills Competition ITAI Track". For example, in 2024, software technology students participated in the Belt and Road BRICS Vocational Skills Competition. The participating team won a national-level award in the field of information technology application innovation with solid professional skills. In the international arena, their innovative solutions were recognized by the judging panel, and they finally won the Excellence Award. The college's ITAI field talent cultivation achievements have been widely recognized. Students have demonstrated deep professional literacy and excellent practical skills, increasing the college's reputation in this field. The school-enterprise cooperation method has continued to deepen in practice, and international exchange channels have been substantially expanded, laying an important foundation for follow-up work.

2.9. Improving the talent training quality evaluation system

According to the characteristics of the ITAI industry's demand for software talents, schools and enterprises

jointly determine multi-dimensional evaluation standards, covering key aspects such as the depth of professional knowledge comprehension, the proficiency of technical application, and the activity of innovative thinking, as well as evaluation index systems for team collaboration ability, professional ethics, and the acquisition of professional qualification certificates. This evaluation system takes into account students' comprehensive literacy and development potential, especially reflecting the characteristics of the ITAI field, and effectively measures educational achievements.

Strengthen the combination of process evaluation and summative evaluation: In the process of talent training quality evaluation, it is necessary to pay attention to students' learning outcomes and their learning processes, incorporating students' daily performance into the evaluation system. At the same time, relying on summative evaluations such as final exams, graduation designs, and professional qualification certificate exams, summarizing and inspecting students' comprehensive learning outcomes. The organic combination of process evaluation and summative evaluation can more comprehensively assess the quality of students' talent training and promote their all-round growth.

3. Problems and improvement strategies of the school-enterprise community education model

3.1. Existing problems

Enterprise participation still needs to be improved: The depth of some school-enterprise cooperation has not met expectations. In the cooperation process, the enthusiasm and initiative of enterprise teachers need to be strengthened. In the design of talent training programs and curriculum teaching links, school-enterprise cooperation needs to be elevated to a higher level, and the internship management link needs optimization. The collaborative effect of schools and enterprises has not been fully exerted, hindering the improvement of talent training quality.

Construction of double-qualified teaching staff needs to be strengthened: Although the proportion of double-qualified teachers in the college has increased, there is still a gap compared with the rapid development needs of the ITAI industry. Some teachers have a solid theoretical foundation, but their practical enterprise experience and new technology application abilities are still weak. ITAI courses focus on hands-on practical ability, and this teaching demand is difficult to fully meet. The training model for double-qualified teachers urgently needs to be reformed. Currently, it mainly relies on individual teachers' practice in enterprises, with a significant lack of systematic training programs and incentive measures, restricting the overall development level of the teaching staff and narrowing teachers' growth paths, hindering the improvement of professional knowledge.

Practice teaching resources are significantly unevenly distributed: The Campus Training Base has invested heavily in domestic operating systems and application software development, but is weak in other directions. However, practice teaching resources in other key ITAI technology directions such as domestic databases and middleware are quite scarce, unable to meet students' learning needs for the full ITAI technology stack. The distribution of professional practice venues is significantly different, and the practical content arranged by some training units has a low correlation with the discipline, and the task challenge is insufficient, limiting the substantial improvement of students' professional skills.

The pace of classroom teaching innovation has slowed down: Some courses still use old models, and certain classrooms have not broken away from the inherent routine. The introduction of new education methods has encountered obstacles, and the traditional lecture method occupies an important position in the practice link.

The innovation of education methods has not been fully popularized. When some teachers adopt innovative methods such as project-oriented teaching and digital simulation teaching, dilemmas such as teaching activities being separated from real cases and simulation resources being unable to meet classroom actual needs affect the actual effect of teaching methods and means and the stimulation of students' learning interest.

3.2. Improvement strategies

3.2.1. Strengthening the systematic construction of double-qualified teaching staff

The ITAI industry puts forward new requirements for the teaching staff. Professional teaching requires teachers who value both theory and practice. The training plan for double-qualified teachers should combine industry dynamics and teaching reality, establish a clear ability framework, and synchronously improve professional knowledge accumulation and teaching skills. Industrial experience and educational concepts must be organically integrated with specific requirements in practical skills, teaching ability, and other aspects, providing a clear direction and goal for the cultivation of double-qualified teachers.

3.2.2. Optimizing the allocation of practical teaching resources

The construction plan for the Campus Training Base should keep up with the technological development pace of the ITAI industry, consider the professional talent training needs, and focus on investing resources in the construction of practical teaching facilities for key technology directions such as domestic databases and middleware. The improvement of the teaching environment should be carried out around these core fields, with the collaborative investment of resources from multiple aspects, the continuous update of modern teaching facilities, and the gradual improvement of the practice platform. As new software and hardware facilities are put in place, the technology learning environment is increasingly optimized, students' practical needs are fully guaranteed, and training conditions for a complete technology chain are already available.

Deepen the school-enterprise collaboration mechanism and innovate the construction of practical teaching carriers. Build diverse industry-education integration platforms, significantly increase the supply ratio of professional counterpart positions, and make the allocation of internship resources more precise. Off-campus internship and training bases should undergo periodic evaluations, focusing on inspecting the practical environment, management quality, and training effectiveness. The evaluation results will determine whether the base is retained, and those with poor performance will be required to improve or stop cooperation to ensure the quality and stability of off-campus internship and training bases and provide high-quality internship and practice platforms for students.

3.2.3. Deepening the innovation of teaching methods and means

The college regularly invites education experts and teaching masters to hold special training sessions, where teachers can master innovative teaching methods. The training content includes teaching design methods, and the discussion session helps improve practical ability. Teachers should actively attempt to innovate teaching methods and develop suitable teaching strategies according to the characteristics of ITAI courses, thereby improving teaching quality and professional literacy.

Construct an evaluation index system for the application of teaching methods, and strengthen the evaluation and feedback on the application of new teaching methods in teachers' teaching. The teaching effect evaluation integrates students' feedback, peer reviews, and supervisor observations, and these multi-perspective opinions are systematically transmitted to teachers, enabling continuous optimization of teaching practices.

Teachers adjust teaching methods based on this information to make classroom interaction more efficient. The effectiveness of teaching innovation should be verified by both students' progress and classroom quality.

4. Conclusion and prospects

Under the rapid development of the ITAI industry, Shanwei Institute of Technology has closely linked with industry needs, deeply cooperated with enterprises, and built a set of characteristic school-enterprise community education models. This innovative approach has significantly improved education quality, enhanced the teaching staff's literacy, increased the degree of school-enterprise common development, promoted the reform of the professional curriculum system, and greatly improved social service efficiency. The talents cultivated by the software technology specialty have strongly promoted the development of the ITAI industry and can also bring impetus to the college's long-term development.

While promoting the school-enterprise cooperation education model, the enthusiasm of enterprises needs to be improved, the construction of professional tutor teams still requires improvement, the distribution of training facilities is uneven, and the pace of teaching method innovation is slow. In response to these problems, the college will adopt corresponding improvement methods, further improve the school-enterprise cooperation education method, improve the talent training method, continuously enhance the talent training quality, and better serve the development needs of the ITAI industry.

Shanwei Institute of Technology is facing the opportunity of the vigorous rise of the ITAI industry. The school-enterprise collaborative education mechanism continues to deepen, teaching reforms continue to advance, the professional curriculum system is continuously optimized, and the scope of social services gradually expands. It strives to build the college into a leading domestic ITAI talent training base and make greater contributions to the development of China's ITAI industry.

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