

# Research on "Race-Enterprise Integration-Driven" Innovative Talent Cultivation of Electromechanical Classes in Applied Colleges and Universities

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**Abstract:** According to the teaching concept and school orientation of Jinzhong Information College to cultivate high-quality applied talents, this paper takes electromechanical majors of applied colleges and universities as the object, and it takes school-enterprise collaboration as the support point, takes subject competition as the breakthrough point, constructs the talent cultivation mode of "race-enterprise fusion drive" with subject competition and school-enterprise collaborative cultivation, promotes the teaching reform, and cultivates applied innovative talents with core competitiveness to adapt to the development of the society and transformation of the industry.

**Keywords:** Application Type; School-enterprise Collaboration; Academic Competition; Personnel Training

## 1. Introduction

In order to further implement the innovation-driven development strategy, enhance the degree of collaboration between universities and enterprises, innovate training models, and promote application-oriented undergraduate colleges to meet the needs of economic and social development. Training high-quality innovative talents is the key to implement innovation-driven strategy, and the talent training mode runs through the whole process of talent training.

Our school is an application-oriented undergraduate university, and mechanical and electrical major is the key construction major of our school. Although there are 10 school-enterprise cooperation bases at present, there are more cooperation in internship, production internship, graduation internship, etc. We have also participated in college student

Electronic Design Competition, National College Student Robot Competition, CIMC "Siemens Cup" China Intelligent Manufacturing Challenge, National 3D Digital Innovation Design Competition and other discipline competitions, and achieved good results, but there is still a lack of correlation between discipline competitions and school-enterprise cooperation, and we have not fully tapped the advantages and potential of competition enterprise integration and joint training of talents. The school-enterprise cooperation mode refers to the close cooperation between colleges and enterprises to provide practical opportunities and platforms for students, so that students can seamlessly connect with enterprises and improve students' practical ability. However, this mode lacks student-centered technology input channels and has the shortcomings of limited coverage [1]. The mode of "promoting learning and teaching through competition", that is, students can improve their professional practice ability and teamwork ability by participating in professional-related discipline competitions, but this mode is more out of touch with society. "Competition and enterprise integration drive" mode, that is, the collaborative education mode combining discipline competition and school-enterprise cooperation, the theme of discipline competition combined with enterprise production activities, enterprises to participate in and guide the discipline competition, that is, "lead the competition into the enterprise, lead the enterprise into the competition", school and enterprise complementary advantages, benign interaction, to achieve a two-way win-win situation. This model can greatly exert the subjective initiative of students, and can accurately connect with enterprises to form a student-centered talent training model, which is also the main model of talent training research in this paper.

## 2. Research Status

Foreign science and technology competitions are generally on a global scale, and the competition organizer is usually an industry association, that is, the combination of competition and industry, and the professional level of the association is in the international leading position in the field, and the setting of competition topics and the selection of entries are more professional. All these provide a new idea for talents training in applied colleges in China, that is, exploring a collaborative education model combining discipline competition and school-enterprise cooperation is an effective way to cultivate innovative talents [2].

There are more and more researches on the cultivation of college students' creativity through discipline competition and school-enterprise cooperation. In the CNKI database, subject competition and school-enterprise cooperation are respectively searched, and the results show that subject competition and school-enterprise collaborative education basically operate independently of each other. The total number of relevant papers in the past five years has reached more than 11,000, but the combination mode of the two is less. From the perspective of relevant research, discipline competitions in some research-oriented universities have broken the limitations of campus and classroom, teachers and laboratories, and provided a platform for engineering practice for students through cooperation and exchanges with enterprises. In the past five years, there were only 222 literatures on the training mode of combining discipline competitions with university and enterprise. Therefore, the combination of discipline competition and school-enterprise cooperation in our country is still not deep enough, especially application-oriented colleges and universities basically operate independently, there is a disconnect between discipline competition and society, and school-enterprise cooperation is just a formality. It is urgent to carry out mechanism and mode reform to improve the quality of application innovation talent training.

## 3. Build a Talent Training Program of "Competition Enterprise Integration Drive"

Taking mechanical and electrical undergraduates of our university as the research object and taking the needs of industrial development as the

starting point, this paper constructs an organic integration model of discipline competition and school-enterprise cooperation, puts forward thoughts on the cultivation of mechanical and electrical talents of the university, and speeds up the transformation of innovative applied talents training in college education reform.

### 3.1 Main Research Contents

College students' discipline competition is an important carrier to cultivate and improve students' practical and innovative ability. At the same time, with the participation and guidance of enterprises, they jointly build an innovation platform for students and use discipline competition to test the "real kung fu" of hands-on practice. In the "competition enterprise integration drive" mode of competition, with the enterprise's first-line engineers in the competition to really recruit, expand students' horizons, and truly become the application of innovative talents in the mechanical and electrical industry. Deepen the cooperation between schools and enterprises, take discipline competition as a breakthrough, teachers timely update the teaching concept, change the teaching ideas and methods, and comprehensively improve the teaching level of teachers. Enterprises also participate in teaching and case teaching, combine teachers with enterprises, take the initiative to adapt to the requirements of employment positions and employment skills, return the initiative to students in class, cultivate students' self-innovation ability, promote the improvement of students' comprehensive quality, and thus improve the quality of education and teaching [3]. Relying on the industrial college, the formation of school-enterprise precise docking, collaborative education long-term mechanism, so that mechanical and electrical professional cooperation enterprise personnel to participate in science and technology competition, discipline construction, etc., to build a practical training practice base, so that teachers and students can participate in the production of enterprises, forming a student-dominated, teacher-led, school-guided, enterprise-guided multi-linkage collaborative education environment.

### 3.2 "Competition Enterprise Integration Drive" Talent Training Program Construction Ideas

Oriented by industry demand, the research on

the orientation of talent training objectives. In view of the structural contradiction between the training of engineering talents in colleges and universities in China and the needs of society, based on the development orientation of our university, the active docking between discipline competitions and enterprises, and the cooperation between schools and enterprises, the practical innovation ability of students is cultivated, the direct transmission chain of talents is formed, and the training objectives of application-oriented innovative talents are studied. The discipline competition is closely related to the contents of several courses. At the same time, the cooperative enterprises participate and guide, adjust the teaching content appropriately, and conduct research on the coordination and unification of the curriculum system of knowledge, ability and quality, so as to achieve the effect of "promoting learning, teaching, innovation and integration through competition". With discipline competition as the carrier, relying on industrial colleges and cooperative enterprises, in order to improve students' practical innovation ability, it is necessary to establish a diverse teaching team composed of high-quality professionals and teachers, implement cross-teaching, and form a collaborative education model of "competition enterprise integration drive" and conduct research. Through the deep integration of discipline competition and enterprise, the enterprise project is deeply integrated into the discipline competition, so that the topic selection and content of the discipline competition are closely related to the actual engineering of the enterprise, and included in the teaching link, the classroom teaching content is in line with the industrial development, and the effective interaction of "teaching, competition and production" is studied. The subject competition should be included in the curriculum assessment to enhance students' enthusiasm and consciousness in participating in the subject competition. Detailed performance appraisal rules have been formulated for the dual tutors (research tutors in the school and practical tutors in the school), and the assessment and evaluation system has been studied to provide effective teachers for the integration of competition enterprises<sup>[4]</sup>.

Taking mechanical and electrical majors as an example, with student development as the center, discipline competition as the carrier, and

engineering application as the guide, the "competition enterprise integration driven" collaborative talent training model with clear goals, precise docking and complementary advantages is built from the aspects of talent training objectives and systems, teaching content and methods, competition enterprise platform, and security mechanism, so as to promote teaching reform research. With students as the center and discipline competition as the link, the scattered and independent links in the course are organically linked with discipline competition, and the effective combination with cooperative enterprises can improve the enthusiasm and participation of students, so that students can actively learn, explore and practice competition knowledge from passive acceptance of classroom knowledge. With discipline competition as the carrier, we break the shackles of the existing campus-based talent training mode, absorb the latest achievements and advanced experience of the industry, integrate excellent educational resources inside and outside the school, and build the environment of competition enterprise integration and education. Taking the opportunity of deepening the integration of competition and enterprise as an opportunity, forming a "multi-body" with students as the main body, teachers as the lead, colleges as the guidance and enterprises as the guidance, and the mutual union and interaction of "teaching, competition and production" among the multi-body are the key to realizing the technical guidance of school and enterprise to students, building a reasonable discipline competition team, and stimulating students' enthusiasm for innovation and entrepreneurship.

#### **4. Implementation of "Competition Enterprise Integration Drive" Talent Training**

##### **4.1 Talent Training Strategy**

Centering on the positioning of "Information Industry Business School", through the active docking of discipline competitions and enterprises as well as the cooperation between schools and enterprises, the transformation from knowledge teaching as the goal to ability oriented goal is realized, and an adaptive closed-loop talent training system of "competition and enterprise integration drive" is formed.

Discipline competitions often focus on social

development and frontier trends, and follow the research ideas of finding problems, analyzing problems and solving problems. In the face of discipline competition, universities can not talk on paper, need the technical support and practice platform of enterprises. Therefore, colleges and universities should take the initiative to step out of the "ivory tower", face the society, serve enterprises, enter into school-enterprise cooperation in the form of discipline competition, enhance the driving force and initiative of school-enterprise cooperation, and realize the precise docking of school-enterprise. The cultivation of talents is a long process, and it is difficult for newly graduated students to immediately become the talents needed by enterprises. It is necessary for enterprises to change the strategy of talent introduction, take the discipline competition as an opportunity, get involved in talent training in colleges and universities in advance, improve students' practical and innovative ability, formulate talent training reserve plans from a strategic height, and build sustainable talent echelons. Colleges and universities have rich educational resources and a wide range of research platforms, while enterprises have a good operating environment, sufficient funds, practice platforms, technical personnel and management teams, etc., which can build a "win-win" talent training model with complementary advantages and positive interaction [5]. The competition team communicates with the enterprise, and gets exercise through practice in the enterprise. At the same time, the enterprise can find excellent and promising innovative talents. To carry out discipline competition effectively, students need cross-border thinking and comprehensive knowledge structure, so colleges and universities should break the original discipline boundary and classroom teaching mode. The establishment of a double tutor team to guide discipline competition can give full play to the advantages of different tutors, achieve multi-dimensional collaboration and cross-disciplinary, and is more conducive to improving the quality and efficiency of discipline competition. Improve and perfect the discipline competition management methods, build the system guarantee of discipline competition and school-enterprise cooperation mode, and fully mobilize and protect the interests of various actors. Guide and motivate from the aspects of project establishment, funding, assessment, etc.,

build the implementation system of discipline competition projects, and reward students and instructors who participate in discipline competition projects, so as to ultimately achieve a win-win situation for participating students, teachers, enterprises and schools [6].

#### **4.2 Implementation Methods of Personnel Training**

Through consulting relevant literature, collecting the relevant information of the existing discipline competition, school-enterprise collaborative education of electromechanical professionals training program, to understand the current domestic and foreign research status, research results, research dynamics of this subject. Fully understand the content and mode of mechanical and electrical discipline competition, and deeply investigate the positions and employment standards of mechanical and electrical students in school-enterprise cooperation units, so as to provide a basis for the formulation of talent training programs; In the implementation of the project, questionnaire survey and teachers' discussion are conducted to find problems in time and sum up experience. The implementation plan will be implemented among students majoring in mechanical and electrical engineering in our school, feedback information will be collected, students' learning status and learning results will be analyzed, existing problems will be analyzed, and the implementation process of the next stage will be improved. The subject will be continuously explored and improved in action research. This paper analyzes and summarizes the problems in the education mode of "competition enterprise integration drive", obtains inspiration from the analysis, obtains experience and learning from the summary, forms a training plan for electromechanical professionals that can be used for reference and operated, and promotes it in the subsequent education process of electromechanical majors.

Analyze the current situation of talent structure and demand trend of electromechanical related enterprises, clarify the positioning of electromechanical major under the environment of school-enterprise collaborative education, and determine the professional training objectives. Select the local electromechanical related cooperative enterprises to investigate and prepare for the establishment of school-enterprise collaborative education

teaching base. With discipline competition as the carrier and school-enterprise collaborative education as the support, the multi-party linkage mechanism with students as the main body, teachers as the lead, colleges as the guidance and enterprises as the guidance is realized, and the phased curriculum system is built.

#### **4.3 Talent Training and Innovation**

Reform the practical teaching of mechanical and electrical majors, construct and improve the practical teaching system, adjust and optimize the practical teaching path, enhance the practical teaching teachers, consolidate and create the practical education base, connect and improve the industrial operation mechanism, and improve the practical ability, engineering ability and innovation ability of students.

The talent training mode of "competition enterprise integration drive" is explored to provide a basis for the teaching mode of applied colleges and universities. This paper, guided by the needs of enterprises, takes discipline competition as a breakthrough, relies on industrial colleges and cooperative enterprises to build a talent training model of "competition enterprise integration" and create a zero-distance discipline competition platform of "enterprise + school + student", effectively promote the discipline construction and professional teaching reform of schools, improve students' practical innovation ability, and realize seamless docking between students and enterprises.

Build a multi-party talent training platform to improve students' innovative ability. With students as the main body, teachers as the lead, colleges as the guidance, enterprises as the guidance to form a multi-interactive teaching model, improve the strength of teachers, build a reasonable structure of science and technology competition team, realize the two teachers to students technical guidance, so that the discipline competition and innovation and entrepreneurship seamless docking, training more excellent applied, innovative and compound talents for enterprises and society.

#### **5. Conclusion**

In the talent training mode of "competition driven by integration of competition and enterprise", the discipline competition has the participation and guidance of enterprises. For colleges and universities, the competition is not only an important test of the teaching effect of

the school, but also has important value in promoting the education and teaching reform of colleges and universities to meet the needs of enterprises.

It strengthens students' innovation ability and improves students' comprehensive quality. The discipline competition is student-centered and designed by the enterprise according to the actual needs. It requires students to exert their design ability, innovation ability, teamwork ability, etc. At the same time, it requires students to persevere and actively seek solutions, so that students' innovation ability and comprehensive quality can be strengthened and improved. Education and teaching reform has been promoted and the quality of personnel training has been improved. The combination of discipline competition and school-enterprise cooperation can promote the teaching reform of colleges and universities, build curriculum system according to the needs of mechanical and electrical majors, innovate teaching forms, enrich and update teaching contents, improve and strengthen students' practical ability, and further promote the realization of talents training goals in application-oriented colleges and universities. It promotes school-enterprise exchange and learning, and achieves a two-way win-win situation between school and enterprise. This paper greatly promotes the effective communication and learning between universities and enterprises, which is conducive to the growth and employment of students, the enhancement of teachers and the improvement of teaching quality. At the same time, enterprises can discover outstanding players through the competition, absorb and reserve talents for the development of enterprises, and achieve a two-way win-win situation between schools and enterprises.

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