

A Study on a Talent Cultivation Mode Based on Industry and Education Integration in Local Universities under Reorientation

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Abstract: As one of China's general policies on educational reform and talent development, industry and education integration has to be followed by local universities under reorientation in the application-oriented talent cultivation. In the process, talent cultivation is a key factor that determines the effects of such a policy. In this context, some possible approaches were proposed in the paper on the basis of an analysis the problems of local universities under reorientation in Jilin Province in their jobs after an introduction to the talent cultivation modes adopted by some of their oversea counterparts.

1. Introduction

While some universities accelerates their reorientation to application in order to promote local economic development through innovation, they have to establish a sound and perfect innovative talent cultivation mode so that they can provide interdisciplinary elites needed by local economy. For this reason, it is of a necessity for them to integrate industry into educational practice during their reorientation to application.

2. International Examples of Talent Cultivation based on Industry and Education Integration

2.1 The “Dual System” in Germany.

The “dual system” initiated and applied in Germany is always taken as a successful model for global vocational education. It features the cooperation between vocational schools and related companies who will work together in designing teaching plans and setting up teaching goals. Within the system, students will receive theoretical instruction at school while receive practical training at cooperative companies at the same time so that they will obtain both diplomas and vocational certificates upon graduation. It is a legally-supported mode across the whole country based on the cooperation between education and industry. Its success lies in the fact that German government formulates scientifically sound legal systems in the field including *Vocational Education Act*, *Labor Promotion Act*, *Enterprise Basic Law* and *Trainer Qualification Regulations*, etc. which define the duties and requirements of both enterprises and schools to govern the two parties' cooperation. Additionally, due attention is paid to teacher training in vocational education. In Germany, a teacher has to receive specialized training specified by certain laws and go through various levels of assessment and selection before working in vocational education. This means that only those who are dedicated to vocational education can receive financial support from the government. Another factor that is decisive for the success of vocational education in the country is students' practical capabilities are taken as focus. For example, students of vocational education spend only 30% of time learning theoretical knowledge at school but 70% working as trainees at cooperating companies. In this way, they can acquire sufficient practical knowledge on company environment and manufacturing technology and processes to prepare themselves for future career.

2.2 CBE in the USA.

CBE, or Competency Based Education, is a competency-based vocational education system

represented by the USA and many other countries in the world. With a purpose to meet market requirements, the system centers around the development of trainees' competency. Specifically, authoritative specialists and scholars are invited to organize a special company committee to design micro teaching modules and learning materials educational on the basis of the specific goals set in accordance with job vacancies. Within this system, a trainee's competency is often taken as the ultimate criterion for the education. This means that its fundamental goal is to promote learners' occupational competency by developing their skills for various jobs. The success of the system reminds us that priority should be given to the establishment of a scientific and sound school-enterprise cooperational mechanism. In the US, for example, the cooperation has been supported by a variety of policies and even guaranteed legally by the law-makers. Besides, American vocational schools value the cooperation with businesses for they are able to offer more relevant and effective training programs to their students and meet social demands as a result. This does not lonely enrich the connotations of vocational education but also brings forth an innovating force to the field. On the other hand, the cooperation draws plenty of attention from enterprises for they can acquire professional employees with both threctical knowledge and operating skills for their own development. In a word, both of vacational schools and enterprises achieve their respective goals within the system, and in return the double-win result of the system makes their coopearation even closer.

2.3 “Sandwich” Education in Britain.

Current British vocational education can be traced back to the year of 1903 when Sunderland Technical College proposed a “Sandwich” system, so named because students have to take a required course working in industry during their days at school. The system features the following practices. First, educational environment and resources of industry and schools are both available for the training of skill-oriented professionals so that theories and practice are integrated closely to promote both teaching and learning. Second, studies in industry are incorporated into the educational program as a required course and have to be consistent with classroom teaching at school in Britain. Third, students will be paid when working in industry as trainee workers. Fourth, students' working in industry has to be fitted with the development of their employers for they are in fact part of available human resources for the companies in the future.

3. Problems of Industry and Education Integration for Talent Cultivation in Local Universities under Reorientation to Application

3.1 Problems of Universities.

The industry and education integration is a newly rising system, so that the authorities of some regional universities under reorientation to application are not quite clear of its meaning, let alone their own faculty teachers. As a result, many problems have arisen in the application of the system.

Take Jilin Agricultural Science and Technology University, a full-time university incorporated by Jilin Provincial Agricultural School and Jilin Specialities Collge upon approval of the Ministry of Education of China in 2003 aiming to train professionals with skills of manufacturing and management, for example. In accordance with the cooperative agreements between the university and over 500 off-campus companies, it has already become a routine practice for the school to send her students to work in these companies or plants as part of their studies and invite some famous company leaders to the school to give lectures. However, such a practice is being challenged with lots of difficulties, e.g. there is no any policy to stimulate teachers to participate in students' practical training, and many of them are in fact negative towards practical programs because of their own hardships in teaching. Additionally, compared with most of newly-recruited teachers with doctor's or master's degree, those applicants with practical experience but without necessary academic title or background are rejected. The imbalanced structure of teachers fails to offer quality application-oriented professionals to social economy, and some of them are even refused by target employers.

3.2 Problems of Cooperators in Industry.

In the past, university students were never worried about job placement because all of them would participate in the post internship programs in state-owned enterprises at the expense of the government. In other words, they were not expected to seek job opportunities by themselves. When private companies of various types play a leading part in today's national economy along with the development of market economy in China, they are neither willing nor powerful enough to sign an agreement of worker training with universities owing to their short-eyesightedness although they are pleased to seek job applicants among university students. This is especially true of the companies in Jilin Province, because most of them have not developed awareness of social responsibility and capability of independent innovation, and very few of them have enough strategic foresight in worker training or brand building. Besides, companies in the province have misgivings about possible rising of operating costs or potential negative effects upon daily business for they have to provide trainers if they accept trainees from universities. However, there is no any policy or plan to support that cooperation financially yet in the province. Another factor that makes some companies, esp., those hi-tech companies, hesitate to invite trainee students is that they may suffer a great loss due to some unexpected incidents concerning manufacturing safety or business secret protection. Finally, many companies find it difficult to obtain essential benefits from the cooperation with some universities under reorientation to application because the latter often fail to provide qualified students to meet their demands due to lack of necessary teachers.

4. Paths for Industry-Education Integration for Talent Cultivation of Local Universities under Reorientation to Application

4.1 Possible Ways to Deepen School-Enterprise Cooperation.

a) Jointly-planning educational programs. Universities should optimize their own resource distribution, design more effective educational programs with special targets and develop strong disciplines and specialties based on their respective educational characteristics to meet companies' demands over professional workers. Additionally, both cooperators may work together to design an educational program as the core of a talent cultivation mode serving both of the two parties' benefits. Such a program has to take into consideration cooperating companies' demands over workers, effective combination of theoretical instructions and practical operation and quality education. Typically, required courses should be selected for all the specialties to design a sound curricular system featuring modularization and integration of various courses as well as a close link between teaching content, methods, tools and assessment and curricular reform that stresses the development of students' capabilities. As for practical teaching, students' practical operational capabilities should be promoted by means of new types of secondary or tertiary classroom activities and extensive practical activities organized on school-enterprise cooperating platforms, e.g. practical training bases set up in some companies on the basis of a scientific proportion of theoretical instruction and practical training in the whole educational program. Another approach that has proved effective is that the universities under reorientation to application should guide their students to develop a scientific outlook of values and employment by means of diversified activities on quality education. After all, one's moral qualities are generally considered a crucial part in his or her comprehensive quality. By following the approaches above, Jilin Agricultural Science and Technology University has already made a success, e.g., more than 10 special training programs such as "Zhengda Program", "Dabei Agriculture Program" and "Hefeng Program" have been set up as effective platforms for school education and industry training.

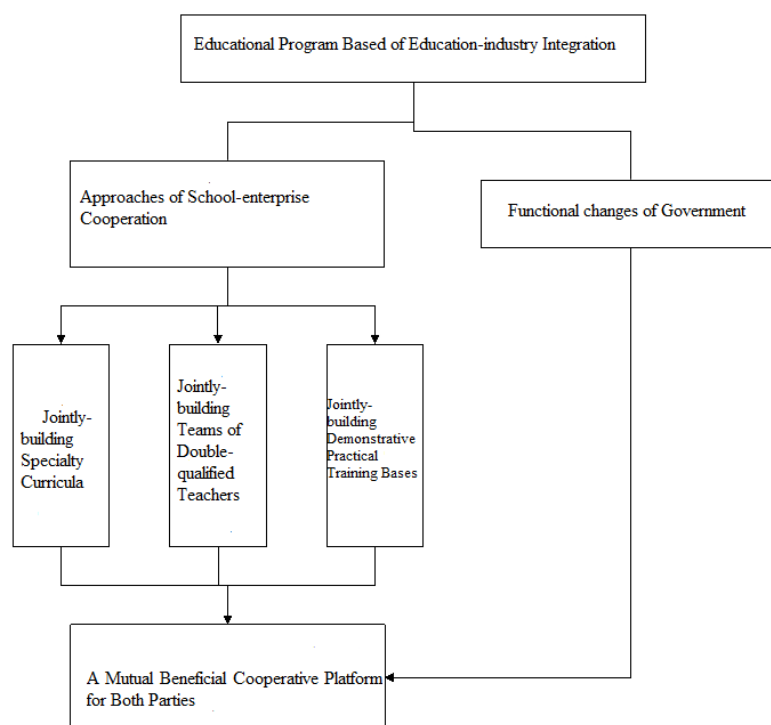


Fig. 1 Approaches for an Educational Program of Education-industry Integration

b) Jointly-building a team of double qualified teachers. For the universities under reorientation in Jilin Province, it is of great necessity to have a team of high quality teachers for their long-term development. In the process of jointly building a team of double-qualified teachers, a policy of “Bringing-in and Going-out” should be taken as a fundamental principle. It means that a university should try to diversify her faculties by bringing in not only full-time teachers of certain majors but part-time teachers such as entrepreneurs, specialists and technicians who will enrich theoretical instructions, deepen the cooperation between the two parties and improve overall qualities of teachers as a whole. At the same time, a university should also send her own teachers to participate in companies’ operation and technical development and attend the conferences concerning industrial development to promote their practical skills as “double-qualified” teachers. This will guarantee a high-level integration of industry, education and research.

c) Jointly-building demonstrative practical bases. Practical bases are of great necessity for a university’s practical teaching. A practical base jointly built by universities and companies means that both parties have an opportunity to give full play to their respective advantages. For example, a campus training base, of which equipment, technology and managerial experiences come from the cooperating company and place and trainees from the university, serves as an effective platform for teachers’ research and students’ learning. On the other hand, off-campus training bases should also be set up in the enterprise for practical training on the basis of a scientific and perfect system that specifies both parties’ duties in joint management over the at-post internship program and protects trainees’ legal rights and benefits during the period. The joint efforts for these bases will not only achieve the goal of mutual benefits and double win of the cooperation but also make the cooperation more sustainable.

4.2 Cooperative Platform Benefiting both Parties.

To achieve the goal that both parties can benefit from their cooperation, a university and her cooperator company should try to seek the balance of their benefits as a community of shared interest. On the one hand, the former aims to build a platform to improve students’ practical operation and techniques and obtain specialized teachers, experiences and equipment needed by practical teaching in the cooperation; On the other hand, the latter hopes to pick out quality workers among the trainee students, build his public image with the other party’s resources and reputation,

accelerate independent research and development under the help of the university's intelligence resources and acquire greater competitive edge. This means that the two parties can maintain the cooperation only when they are dedicated to the goal of mutual benefits and win-win.

Take the cooperation between Jilin Engineering Normal University and Jilin Provincial General Machinery Co., Ltd. for example. The "Jitong Engineer College" jointly built by the two cooperators not only stimulates the university's further reform in the reorientation to application, but also implements the policies in *Several Opinions on Deepening Industry and Education Integration*. On this basis, a new educational program for application-oriented talents which features a "2.5+1.5+1" mode, i.e. students study at school for 2.5 years, work as trainees in the company for 1.5 years and then work as trainee engineers at the company for 1 year after graduation, has been formulated in the university to train versatile skill-oriented engineers to satisfy the company's needs for quality employees.

4.3 Functional Changes of Government to Promote School-Enterprise Cooperation.

Since government plays a crucial role in the emergence and application of school-enterprise cooperation, its success has to depend on government's guiding policies and systematic guarantee like related laws or regulations and governmental authority. This is because government support will not only help the two parties give full play to their own advantages but also maximize their respective benefits and bring forth good social response. Additionally, to make it sustainable, the cooperators should have to set up a common goal supported by government and other related parties. This requires that government should refine relevant laws and regulations to define both cooperators' duties and protect their respective rights and interests. Apart from legal improvement, government should also formulate special supporting policies. In Jilin Province, government should try to promote the cooperation to more universities and companies by means of effective financial support like tax reduction and capital investment. Another job for government is that a scientific and effective coordinated management system should be designed to specify and coordinate the relationships among the managing bodies of the school-enterprise cooperation so as to make it more effective, standardized and scientific.

5. Conclusion

Industry-education integration and school-enterprise cooperation are necessary for vocational education in China to train more practical skill-oriented talents for the society, but all the related parties in the cooperation like government, industry and universities should make a joint effort to promote the job. For the universities under reorientation to application in Jilin province, it is very likely to achieve the goal of mutual benefits and double win if they adopt the cooperative mechanism in their educational reform. However, they should have to define the duties of all the participators for the sustainability of the cooperation and the quality of vocational education so as to offer more specialized application-oriented talents to the industry and even the whole society.

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