CASE STUDY OF AN EXCELLENT TVET INSTITUTION¹:

Agricultural TVET Schools, China

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Introduction

Background

Over the last several decades, economic growth in East Asian and Pacific countries (EAP) has been highly dependent on investment and export. In order to upgrade their economic structures, the East Asian countries are actively adjusting their long-term development policies to accelerate the pace of economic transformation and industrial upgrading.

The restructuring of the EAP economy needs support from all types of talents. A large number of innovative, scientific and technical workers are needed for production and in order to bring about this transformation. The need for restructuring has imposed challenges on vocational education across EAP. In order to promote the reform and development of vocational education to meet changing economic and industrial demands, the World Bank has organized a team of experts to conduct case studies of outstanding TVET schools in select EAP countries. This report summarizes the successful experience of three Chinese agricultural TVET schools (one secondary vocational school and two tertiary vocational schools), analyses the problems they have encountered in their operation, and provides lessons learned to improve vocational education. The research is part of “Excellent TVET Institutions in East Asia and Pacific (EAP),” a larger study commissioned by the World Bank.

Literature Review

Generally, education output includes overall school quality, the employment rate of graduates, the satisfaction rate of enterprises, etc. Many scholars assert that the level of educational output is related to teacher, curriculum, management, school-enterprise cooperation and so on. According to Yan Li (2008), a teacher’s education, knowledge, and teaching experience and method affect the quality of teaching. In addition, many cases of curriculum reform in the vocational schools also show that curriculum is closely related to educational output. For example, the finance major of Zhejiang Wanli University has carried out a series of curriculum reforms by combining and reorganizing the major courses. These reforms have improved both the learning capacity of students and the employment rate of graduates. In regard to the influence of school leadership, the scholars Jian Sun and Junqing Ren researched education in Ningbo Polytechnic, and analysed the positive role of the principal’s leadership in setting the school goal, forming the development strategy, and implementing the initiative. Some scholars (Qin Shuwen and Xiao Guiyun, 2012) also believe that school-enterprise cooperation can improve the training course, and further promote graduate employment opportunities.

Research Method

Basic Assumption

Case studies were conducted to verify that:
(1) Graduates of excellent TVET schools have high levels of enterprise recognition, employment rates and employment quality.

(2) Excellent TVET schools have a strong ability to serve the community.

(3) Excellent TVET schools have high-quality teachers, better teaching conditions, courses that meet the needs of enterprises, effective management, and strong school-enterprise cooperation.

If the above assumptions can be verified, we can conclude: by improving the factors of teacher quality, teaching conditions, curriculum, school management and school-enterprise cooperation, we can enhance the quality of a school.

Research Method

In order to verify the above assumptions, we have adopted the research methods of questionnaire and interview.

Questionnaire survey method

a. Objective

The case study of three outstanding Chinese agricultural TVET schools will (1) clarify the connotation and standard of excellent TVET schools; (2) analyse the output of outstanding TVET schools such as the employment rate of their graduates and their ability to serve the community; (3) examine the current status of the outstanding TVET schools from the aspects of teacher, teaching facility, curriculum, school management and school-enterprise cooperation, and summarize their experience as well as the areas that need to be improved; and (4) based on the research conclusions, offer suggestions to promote development of agricultural TVET schools.

The research can provide an empirical basis for policy makers to formulate vocational education policy and guidance for a school to reform and develop their education system.

b. Case Selection

The basis of case selection is (1) to choose TVET schools in the major agricultural provinces that contribute to the development of the regional economy; (2) due to the different economic development and environment of Chinese regions, select schools across the different regions; and (3) select schools that are recognized as model vocational schools that have the strongest influence in the industry.

In accordance with the above criteria, we have selected Xinjiang Agricultural Vocational Technical College from the major agricultural province of Western China, Nan Gong Vocational and Technical Education Centre from Eastern China, and Heilongjiang Nongken Vocational College from the Northeastern China. Both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre are the model schools for the “National Vocational Education Reform and Development”, while Heilongjiang Nongken Vocational College is the leading school of “Heilongjiang Vocational Education Reform and Development.”
c. Design of Questionnaire

A total of five questionnaires were designed for the study: 1) a school, 2) its departments, 3) teachers, 4) students and 5) enterprises. The first set of questionnaires for a school and its departments cover its basic status, educational output, and other related information including its funding and expenditure; the questionnaires for the teachers and students survey their perspectives on the school facility and equipment, teacher quality, curriculum, school management, school-enterprise cooperation, etc.; and the final questionnaire for enterprises involves their evaluation on the quality of school graduates and cooperation with schools.

Interview and field research

The interviews and field research were conducted to understand the elements that affect school quality; summarize the successful experience of school operation; discover problems encountered in the operation process; understand the opinions of teachers, students and enterprises in regards to the schools; and provide suggestions for the improvement of education quality and operational efficiency.

The team visited three TVET schools to conduct the interviews, and held seminars for teachers, students, and the enterprises. Interviews with the school leaders were also conducted to understand the school operation. These interviews have provided the factual evidence for this case study.

Chinese Education System and Economic Development

Chinese Education System

The Chinese education system consists of five parts, namely, preschool, primary, secondary, higher and continuing education. Secondary education consists of two stages: middle school and high school. Their education periods are 3 years respectively, of which middle school is divided into ordinary middle school and vocational middle school. High school is also divided into ordinary high school and secondary vocational school (including vocational high school, technical school and specialized secondary school). Higher education includes technical education, undergraduate education and graduate education. Technical education is for 2-3 years, while undergraduate education is for 4 years. Continuing education includes literacy education, adult primary/secondary/higher education, adult vocational education, community education and so on.

Expansion of Chinese Education and Industrialization

In China, the expansion of education is closely related to its industrialization, economic growth and labour market demands. Economic policy plays an especially important guiding role in the formation of education policy.
In the 1990s, China’s economy changed from a planned economy to a market economy. The state has vigorously popularized compulsory education, while continuing to develop both vocational education and higher education to meet the needs of economic development.

Since 2010, the promotion of national strategy, such as "Made in China 2025," has provided a new direction of Chinese economy to industrialization, urbanization, informatization and self-dependent innovation. The long-term and rapid development of the Chinese economy has promoted stable and high-quality education at all stages.

After expanding higher education enrolment since 1999, the gross higher education enrolment rate increased from 10.5% in 1999 to 37.5% in 2014. With the challenge of new technology development, China will need not only industrial restructuring, but also to train the human capital needed for a new round of growth.

**Industry Development and Employment**

Since its economic reform, China has gradually expanded the proportion of the secondary (manufacturing) and tertiary (service) industries. Between 1995 and 2014, the share of the primary industry's contribution to GDP was consistently below 10%. On the other hand, the contribution rate of the tertiary industry to GDP showed steady growth, and has risen from 28.5% in 1995 to 47.9% in 2014. The change of the economic structure had a great influence on China's job market. The number of employees in the primary industry (collection of natural resources, i.e. farming, fishing) has been decreasing every year, while the number in the secondary and tertiary industries showed an increasing trend. From the long-term trend, the changing industrial structure has directly influenced labour demand, and is also closely linked to the employment issues of the agriculture sector.

**Agriculture Industry and Vocational Education in China**

**Agriculture Industry in China**

China’s agriculture industry is experiencing a rapid change in structure, as the proportion of planting has been shrinking, but that of stock farming, fishery and forestry have been continuously increasing. The emergence of "company + farmer," "cooperative + farmer" and other organizational forms have diversified the sector’s management model. In addition, advancements in agricultural science and technology have been continued, mainly reflected in the development of biotechnology, mechanization, pest control, and livestock breeding.

Although the contribution rate of Chinese scientific and technological development to the agriculture sector has increased from 27% in the late 1970s to 43% in 2016, compared to the advanced economies’ average of above 60% there is still a gap in its contribution.
Agricultural Employment in China

Over the last 30 years, the agricultural labour force has decreased by 200 million as they have left the land to work in cities and towns. The remaining farmers, mostly working in traditional farming, are unfamiliar with the new agricultural technology and knowledge.

However, development of agricultural technology, agricultural product brands, and rural land development have promoted training for all kinds of skills to meet the needs of modern agricultural development. It is estimated that by 2020 China will need 18 million agricultural talents in the areas of (1) family farm management and chain business management, (2) agricultural technology research and food safety management, (3) international trade and marketing, and (4) rural cooperatives management and enterprise management.

Agricultural Vocational Education in China

As an important component of the education system, agricultural vocational education aims to train technical personnel, managers and skilled agricultural workers. Agricultural vocational education in China consists of secondary vocational education, higher vocational education and various formats of adult vocational education and training.

Higher agricultural vocational education is mainly implemented by agricultural vocational colleges and some local agricultural universities. In recent years, the scale of agricultural vocational education at the college level is relatively stable, but its overall size is small.

Secondary agricultural vocational education is mainly implemented by secondary agricultural vocational schools and county-level vocational education centres. In recent years, the overall scale of secondary vocational education has been shrinking.

Adult agricultural vocational education includes village-level classes to teach agricultural knowledge, production techniques and operational skills. The Central Agricultural Broadcasting School under the Ministry of Agriculture also provides training for farmers. Overall, the scale of adult agricultural vocational education has been decreasing every year.

Case Study Analysis

About the Schools

Xinjiang Agricultural Vocational Technical College

Xinjiang Agricultural Vocational Technical College is a full-time higher education institute for vocational education. Founded in 1958, it is under the leadership of the Agricultural Department of the Xinjiang Uygur Autonomous Region. In December 2006, it was selected as one of the key institutions for the “Construction Plan of National Demonstrative Higher Vocational Schools” by the Ministry of Education and the Ministry of Finance.

The school has 13 branch institutes, and 60 majors which mainly focus on the agricultural sector but cover the areas of humanities, economy, trade, management, engineering and
Information Technology (IT). It has more than 12,000 full-time students and more than 800 staff members. The school also carries out joint education with countries like Malaysia and Kyrgyzstan.

The College of Animal Science, College of Biotechnology, and College of Horticultural Science are the main agricultural institutes of Xinjiang Agricultural Vocational Technical College. In this study, the three institutes were selected as the research targets, and both questionnaires and field research were conducted.

**Nan Gong Vocational and Technical Education Center**

Nan Gong Vocational and Technical Education Centre is one of the first national model secondary vocational schools for Vocational Education Reform and Development. It provides programs of academic education, short-term training, skill appraisal and technology promotion. It has 20 majors in the areas of agriculture and forestry, processing and manufacturing, etc. The school has 380 teachers, 4,200 students for academic education and more than 6,000 students for short-term training.

The school has 2 majors related to agriculture: (1) modern agriculture and (2) animal husbandry and veterinary medicine, recruiting 30 to 40 students for each major every year. The school has also been active in serving farmers and the rural community. It has contributed to the development of the local economy by making use of the school’s educational resources to train the local workforce for farming.

**Heilongjiang Nongken Vocational College**

Heilongjiang Nongken Vocational College is a full-time public vocational college with a history of more than 50 years. It is one of the model vocational schools of the Construction Plan of Vocational Schools in Heilongjiang and also the Chair of the Teaching Committee for Food Majors in Heilongjiang. The school provides excellent equipment and facilities for training. There are 220 training rooms in the school and 224 training centres outside the school, and they have teaching and research equipment worth more than RMB 58 million. The school has six branch institutes encompassing the areas of food engineering, pharmaceutical engineering, nursing, etc. It also has the majors of green food production, architectural engineering, and computer network technology, among others.

The employment rate of school graduates is more than 98%, with an employer satisfaction rate of 98%. The school also provides joint-training with foreign schools including those in South Korea, Singapore and Thailand. The school conducts an exchange program for teachers and students, and it shares advanced educational resources with those schools.

The food engineering major of the school employs a "2+1" model of training, under which the students learn on campus for 2 years, and train through an internship for 1 year. Graduates are mainly employed in technical management positions of medium and large-sized food enterprises such as Yili, Wandashan Dairy and Mengniu Dairy.
The Target of Questionnaire Survey

Teachers

In terms of gender, female teachers are in the majority for both Nan Gong Vocational and Technical Education Centre and Heilongjiang Nongken Vocational College, whereas Xinjiang Agricultural Vocational Technical College has a similar ratio of both male and female teachers. All three schools mainly have young and middle-aged teachers, and most of the teachers have both an undergraduate and master's degree with significant work experience in a company.

Students

Both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre have similar proportions of male to female students, whereas Heilongjiang Nongken Vocational College has a significantly higher number of female students (83.27%). In addition, all three schools have a balanced distribution of students in each grade.

Enterprises

Private enterprise accounts for the majority of enterprises in all three schools. With regards to scale, medium-sized enterprises account for more than half of enterprises in both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre, followed by the small-sized enterprise. For Heilongjiang Nongken Vocational College, 61.11% of their cooperating enterprises are medium-sized and 27.78% are large enterprises.

School Outputs

Social Recognition of Graduates

Social recognition of graduates is an important criterion for an excellent vocational school. The main indicators of graduates’ recognition are a high employment rate, excellent quality of employment and recognition by enterprises.

In terms of employment rate, the overall employment rate of agriculture majors in all three schools from 2012 to 2015 was above 90%. The average starting salary, which is an indicator of the quality of employment, increased from 2010 to 2015 at Xinjiang Agricultural Vocational Technical College. For the evaluation of the quality of graduates, enterprises indicated that they were “relatively satisfied” with the graduates of both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre. Especially in the category of graduates’ “responsibility” and “compliance with industry and enterprise standards,” both schools received the highest evaluation. For Heilongjiang Nongken Vocational College, the enterprises regarded the

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quality of graduates as “very strong” compared to graduates of other vocational schools, indicating high recognition of the school by the enterprises.

The Ability of a School to Benefit Enterprises

The ability of a school to benefit enterprises is mainly reflected in the training of high-quality graduates for enterprises, providing training for employees in enterprises, helping enterprises to solve technical problems and supporting technical research of enterprises.

As evidenced in both the surveys and interviews, the teachers in Xinjiang Agricultural Vocational Technical College and Heilongjiang Nongken Vocational College believe that the schools have strong abilities in “training high-quality graduates for enterprises” and “providing training for employees in enterprises.” However, they find that the schools have limited ability in both “helping enterprises to solve technical problems” and “supporting technical research of enterprises.” On the other hand, the teachers in Nan Gong Vocational and Technical Education Centre believe that in addition to the training of high-quality personnel, the school can solve the technical problems encountered by the enterprises.

The Ability of a School to Benefit Community

The ability of a school to benefit community is another indicator to determine an outstanding vocational school.

Xinjiang Agricultural Vocational Technical College regards serving the local community, solving problems for local government, and promoting regional economic development as important school tasks. By dispatching management teams and teachers, the school manages several county-level vocational schools. In addition, the students and teachers in the agriculture major help farmers during the harvest season, and those in the veterinary major often provide guidance in epidemic prevention among farm animals. The Nan Gong Vocational and Technical Education Centre also supports the process of fertilizer selection, sales and food processing for local farmers. In addition, Heilongjiang Nongken Vocational College has participated in designing and training for the “Construction Plan of the Pilot Area for the Agricultural Vocational Education Reform.”

The Influence of the School

The influence of the school is mainly reflected in its impact on vocational education, industry and students.

All three schools have been widely recognized by industry since they have been selected as model schools for national vocational education. In the survey of Xinjiang Agricultural Vocational Technical College, we found that the school has a strong influence in the local agricultural industry. The majority of managers from the industry are graduates of the school, and the school graduates are in high demand from the labour market. In addition, a majority of the teachers in both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre showed their satisfaction with the ability of schools to attract high-quality students. However, the teachers in Heilongjiang Nongken

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Vocational College regarded the influence of the school in recruiting outstanding students as average.

Material Resources

Financial Resources

Regarding income from both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre from 2012 to 2015, public finance from the provincial governments has grown due to their increased investment in vocational education. However, tuition income has steadily declined resulting from a reduction in the total number of students and tuition exemption for some students.

For Heilongjiang Nongken Vocational College, the teachers believe that the school provides sufficient financial support to students, and it plays an important role in attracting high-quality students who have financial difficulties. However, from the survey we found that the students were not satisfied with their financial support, and it needs to be more centralized and increased.

For school expenditures, both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre mainly disburse on staff wages and benefits. On the other hand, we found that the expense to improve school equipment and teacher training is insufficient. The interview from Xinjiang Agricultural Vocational Technical College showed that the school's overall operation needs more funding, and the current funding level can only maintain its basic operation.

Facility and Equipment

From the survey, the Xinjiang Agricultural Vocational Technical College teachers’ evaluation on the school facility and equipment was not high. Besides the evaluation of the school meals averaging "relatively satisfied," the evaluation of other items was in between "average" and "relatively satisfied" and more towards “average.” The teachers believe that the condition of student life and learning needs more improvement. The students also agree that the school should improve their housing, classroom and entertainment facility.

On the other hand, for both Nan Gong Vocational and Technical Education Centre and Heilongjiang Nongken Vocational College, the teachers provided the highest evaluation on "the training facility of the school." The students also agree with the teachers’ opinion, but they think school housing still needs more improvement.

Teachers

Teacher Quality

From the survey of students on the "evaluation of teacher quality," students in all three schools had a high evaluation of their teachers' quality. There was little difference in scores between the criteria of quality, and most of them are close to the "satisfied" level. The criteria for a teacher’s quality include: "teacher’s professional knowledge," "the relationship
between teachers and students," "teaching ability," and "cooperation between teachers and other teachers."

Teacher Training

According to the survey on teachers’ on-the-job training, most of the teachers responded that they had received training, and they are attending training for more than 20 hours every year. However, more than half of the teachers did not have training from the company that has signed the cooperation agreement with the school, and this makes it difficult for teachers to introduce the company culture to the students and provide targeted guidance for employment.

Criteria for Recruiting Teachers

Most teachers believe that teachers in vocational schools should have specific industry experience in addition to teaching experience, emphasizing the difference between vocational education and general education. With specific industry experience, teachers can better guide students toward employment and help them adapt to the work environment.

Curriculum and Educational Resources

Curriculum

Most teachers in all three schools regard the school curriculum as competitive, and students are also satisfied with their programs. However, despite their high evaluation, we found that students still need to receive additional training outside the school, and there is a gap between curricula and enterprises’ needs.

Practical Course and Skill Development

A majority of the students believe that the schools provide sufficient training to prepare for a job. More than half of the students receive less than 10 hours of practical training every week, and one-third of students receive 11-15 hours of training. We also found that there is a significant difference in training hours among the grades.

Internship

A majority of students in both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre responded as having participated in an internship program before, while only 39.44% of Heilongjiang Nongken Vocational College students participated in the program. Their main reasons of not attending the internship were because it is difficult to find an enterprise and time. From the interviews with students, we found that the schools do not offer an internship opportunity for first-year students.

In regard to the size of enterprises for student internship, more than one-third of the students in both Xinjiang Agricultural Vocational Technical College and Heilongjiang Nongken Vocational College have worked in enterprises with 50-100 employees. On the other hand, 77.94% of students in Nan Gong Vocational and Technical Education Centre have worked in enterprises with less than 50 employees. Among the students, more than 75% of students in both Xinjiang Agricultural Vocational Technical College and Heilongjiang Nongken Vocational College received a salary for the internship, at the corresponding wage level of
the labour market. However, 67.65% of students in Nan Gong Vocational and Technical Education Centre were not able to receive a salary, reflecting the lack of a student internship remuneration system in the school.

Despite more than half of the students expressing their satisfaction with the correlation between internships and school learning, there is still a gap that needs to be resolved. This gap arises from the school curriculum failing to reflect the actual needs of enterprises, while enterprises therefore do not provide positions that adequately reflect student majors.

Regarding student satisfaction with the overall internship, students had high satisfaction on “training directors of an enterprise,” “level of responsibility and work,” and “the working environment.” Students were mostly satisfied with all aspects of the internship program, believed that the schools were looking for internships that were well-suited to individual students, and that they are partnering closely with the enterprises. However, since the students’ evaluation on “remuneration and benefit” was relatively low, the schools need to further discuss with the enterprises to improve student remuneration and benefits during the internship.

Management

Teachers in both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre provided a high evaluation of school management. The criteria that received the highest scores are "school leaders can prepare for the future and continue to innovate” and “school leaders have clear principles of management.” On the other hand, the teachers of Heilongjiang Nongken Vocational College believe that school leaders need to encourage more cooperation among teachers and appreciate teachers’ contribution to the school.

Cooperation with Enterprises

Xinjiang Agricultural Vocational Technical College partners with various types of enterprises, and its main partners are small and medium-sized private companies. In regard to the job profile of graduates accepted by these companies, the graduates who are working in the technical guidance position of a production line account for the most (43.68%). The survey showed that most of the school graduates are favoured by the enterprises in employment decisions.

The teachers in all three schools believe that factors which hinder the partnership between school and enterprise are “a school wants to cooperate with an enterprise, but it lacks the ability" and "an enterprise is not interested in the cooperation.” They believe that a school loses its appeal in cooperation when it cannot provide a benefit to an enterprise.

Enterprise Participation in Student Training

The main way in which an enterprise participates in student training is to provide an internship program. Information from both Xinjiang Agricultural Vocational Technical College and Nan Gong Vocational and Technical Education Centre demonstrated that the
participation of an enterprise in curriculum development is lacking. However, if an enterprise does not directly participate in curriculum development, the school curriculum cannot reflect the actual needs of enterprises. The interview also revealed that most enterprises have neither the resources nor ability to undertake curriculum development, and they lack enthusiasm for participation, which may have resulted from the compensation provided by the school.

According to the survey of enterprises, 89.36% of enterprises regarded the internship students as their apprentices, and helped them to participate in production under the guidance of directors. However, we also found that there are many situations where students are only used as simple manual workers after undemanding training.

**Enterprise Evaluation of the School-Enterprise Cooperation**

According to the survey, the enterprises’ evaluation on all aspects of school-enterprise cooperation was very high. The criteria of the evaluation included "communication and coordination between the school and enterprise," "cooperative education conducted by both school and enterprise" and “the school provides staff training for the enterprise.” Overall, the enterprises were satisfied with their cooperation with all three schools.

**School’s Career Development System**

From the survey, the teachers in both Xinjiang Agricultural Vocational Technical College and Heilongjiang Nongken Vocational College evaluated the school’s career support system as average, whereas the teachers in Nan Gong Vocational and Technical Education Centre evaluated the system as an important tool for a student’s career planning. For the students, more than half of them were satisfied with the career counselling service offered by the school, and more than 90% of students think career counselling contributes to their life planning.

With respect to continuing education, more than 60% of students want to pursue a higher degree. The majority of teachers in all three schools believe that the academic courses of schools can support their students to further their studies.

**The Impact of Government Policy**

From the survey question on "how much does the government's vocational education policy affect the school governance and policy?" the teachers believe that the government's policy affects the school governance to a certain extent. Most of them think that the national leaders have consistent vocational education policy and they think the government has an effective school-enterprise cooperation policy, quality assurance framework and financial mechanism, which promote improvement of school quality.
The Problems and Lessons Learned from the Excellent Agricultural Vocational Schools

Lessons Learned

From the case study of the three vocational schools, we have learned that the excellent agricultural vocational schools persist in serving the rural community, strengthening school-enterprise cooperation, and innovating the talent training model.

Serving the Rural Community

One of the common traits of the three schools is service to the rural community and farmers. Nan Gong Vocational and Technical Education Centre has been making full use of school resources to support the 12 agricultural model villages including Wangtun, Xiezhai and Xiaochang. Xinjiang Agricultural Vocational Technical College also worked with Ulan Wusu town to promote the development of local economy. The school has dispatched teachers to train farmers in cultivation, pest control and preservation. The training has promoted the popularization of new agricultural technology and production methods, and optimized planting approaches throughout the entire town where the school is located. In addition, Heilongjiang Nongken Vocational College has actively participated in construction of the pilot areas for the Agricultural Vocational Education Reform. Since 2012, it has supported the construction and management of pilot areas including Nehe City, Wudalianchi City and Fuyu County.

Strengthening the School-Enterprise Cooperation

School-enterprise cooperation is one of the key factors that affect the quality of talent training. Nan Gong Vocational and Technical Education Centre and partner enterprises have jointly built 9 farms, 2 training centres, 3 research laboratories on campus and 10 training centres outside the school. Xinjiang Agricultural Vocational Technical College and partner enterprises have been cooperated on various fronts. For example, they have built a training centre for both seed production and management majors, and developed eight training courses reflecting seed production companies’ work. In addition, Heilongjiang Nongken Vocational College established a province level school-enterprise cooperation group for food majors. The group provided consultation and research and development (R&D) to the companies. For example, it offered food safety and quality system training to the companies including Mengniu, Yili, Wandashan. It has also conducted the R&D on the preservation of mashed potato for a company in Qiqihar.

Innovating the Talent Training Model

Innovating the talent training model to improve the quality of training is another common trait of excellent agricultural vocational schools. Nan Gong Vocational and Technical Education Centre used the rotation training model to help students to find employment and positions suited for them. For the training of the animal husbandry major for example, the school has divided three teaching districts in Nan Gong according to their specialized areas of farming, and helped students to select one of them for their career development. The students can experience training from all three districts, with different positions offered by an enterprise in each district. The training model has provided the students an opportunity to
experience the different areas of farming based on the characteristics of regional agricultural economies.

Xinjiang Agricultural Vocational Technical College has also implemented the various forms of work-integrated learning to meet the needs of high-quality personnel training. For Heilongjiang Nongken Vocational College, its training focuses on the student’s sense of cooperation, sharing, and quality assurance. In addition, the teachers designed the education content and methods to stimulate the student’s interest in self-learning.

Problems

Although all three schools have accumulated successful experience in their operations, there are still areas that need to be improved, mainly reflected in:

Decline in Agriculture Related Majors

Nowadays, the students studying in agriculture related majors are decreasing every year, causing a shrinkage of the size of the majors. So the schools began to expand the majors related to the secondary and tertiary industries. This phenomenon is more evident in the secondary vocational schools. One of the main reasons is that due to the low social recognition of the agricultural profession, most parents are not willing to let their children study in the agriculture related majors. In addition, the level of economic development in rural areas is comparatively low, so there is no attraction for graduates to work at the rural area. From the field research of Nan Gong Vocational and Technical Education Centre, we found that most graduates want to work in a big city in Hebei, and are reluctant to stay in Nan Gong for local employment.

Limitation in School-Enterprise Cooperation

The surveys showed that most enterprises working with the schools are small enterprises, and their main reason for cooperation is to solve their labour shortage problems. At Nan Gong Vocational and Technical Education it was found that because of the enterprises’ size and low level of technical capacity, it is difficult for the students to learn new technology from them, and the enterprises can only offer lower quality jobs. The students in Xinjiang Agricultural Vocational Technical College also expressed that since their internship program was not administered with a clear plan and content, they were mainly used as a simple manual workforce. For Heilongjiang Nongken Vocational College, school-enterprise cooperation has been heavily reliant upon personal relationships, preventing the establishment of a formal system of cooperation.

Shortage in School Resources

Although the three schools are the national model vocational schools, their resources still cannot fully meet the teaching requirements. First of all, their training facilities need to be improved and the schools must invest in the equipment of the newly opened majors. For example, if there was no assistance from enterprises, “the horse industry major” of Xinjiang Agricultural Vocational Technical College would have never met the needs of high-quality training. Secondly, the schools need more IT resources to provide on-line courses for students. Thirdly, student living conditions require improvement. We have found that
Xinjiang Agricultural Vocational Technical College students have poor accommodations, and the school should meet the students’ demand for better living conditions. Lastly, the teaching capability of teachers needs to be enhanced. A large number of teachers do not have work experience in an enterprise, and due to their heavy workload, they do not have time to participate in training to improve their practical teaching. So the schools need to provide the incentive and support for teachers to participate in practical training.

The Frequent Reform of Curriculum in Vocational Education

With the frequent reform of curricula, many educational plans have to be changed before their full implementation. Frequent reform also makes it difficult for teachers to understand and apply them in a short period of time.

Suggestions on Promoting the Development of Agricultural Vocational Education

Develop the Modern Agricultural Economy

Vocational education is closely linked to the development of regional economies in China. To support the country’s economic development goals, the government must continue to pursue agricultural modernization, which in turn will promote further development of agricultural vocational education. In order to do so, the structure of agricultural industry must be adjusted to promote green and creative agricultural production. Second, the processing industry of local agricultural products should be further developed to increase its added value. Third, the agricultural cooperative model to support the farmers throughout the production process could be better developed. Lastly, the online market of agricultural products must be further developed to promote their production, sales, branding and other related activities.

Enhance the Attraction of Agriculture Related Majors

China needs to raise awareness of the developing agriculture sector. Currently, the development of the agriculture industry is far beyond the traditional planting, and this new development requires a large number of excellent skilled workers. Therefore, efforts are needed to publicize its development and technology through media to raise awareness and attract highly skilled professionals. The agricultural vocational schools also need to strengthen their publicity activities to attract more students and attention. Through the media and regular visits to high schools, they can provide potential students with more information about the school and encourage them to apply.

Improve the Ability of a Vocational School to Serve the Regional Economy

In order to train high-quality professionals for the development of modern agriculture and the regional economy, a school needs to adjust its majors to incorporate content related to new agricultural trends and technology. In addition, it needs to further strengthen its infrastructure, teaching staff and school-enterprise cooperation to improve the quality of
education and training. In this way, a school can make full use of its resources to contribute to regional economic development.

**Leverage Government Policy**

The government can reduce or exempt the tuition of students from agriculture related majors to attract more high-quality students. It also needs to increase public finance to improve learning conditions within agricultural vocational schools and between the schools and enterprises. The increase in teacher welfare and training will also do much to further development of agricultural vocational education.