National Case Studies

"Best Practices" in Technical and Vocational Education

- China, the People's Democratic Republic of Korea and Mongolia
The studies were designed and coordinated by UNESCO Office Beijing, through the National Commissions for UNESCO in China, the Democratic People’s Republic of Korea and Mongolia.

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The DPR of Korea National Commission for UNESCO - DPR of Korea  
Mongolian National Institute of Education and National Observatory of Mongolia - Mongolia

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The National Case Studies on Best Practices in Technical and Vocational Education in China, DPR Korea and Mongolia

INTRODUCTION

China, the Democratic People's Republic of Korea (DPRK) and Mongolia are part of the countries of North East Asia. These countries face many concerns in the area of technical and vocational education (TVE), especially those relating to the provision of sound TVE in the context of pervasive changes. In this light, questions of relevance of curriculum, quality of knowledge and skills of students completing vocational education loom large. In the case of Mongolia, the transition from a planned to a free market economy has posed challenges to the system of TVE, as old practices have become obsolete. Through a recent UNESCO PROAP Mobile Training Team Project under the Japanese Funds-in-Trust, vocational educators were being acquainted with innovative practices in other countries in the Asia-Pacific Region. China is in the throes of reform as it gears itself for the emerging world of instantaneous communication. In this connection, several initiatives are underway to improve the relevance and quality of TVE. Moreover, quality and flexible knowledge and skills are necessary attributes in producing competitive products and future learning. The intrusion of information and communication technologies in the lives of all impels TVE improvement. Therefore, there is a growing realization of the important role of TVE training (TVET) in the development of individuals and preparation of the workforce in the 21st century.

As a follow up to the recommendations of the Second International Congress on Technical and Vocational education (April 1999), subsequently adopted by the General Conference (1999), three national case studies on selected "best practices" in China, DPR Korea and Mongolia were carried out. The case studies in the three countries were carried out between June and November 2000. Each country selected one or two themes/dimensions in the provision of TVE and identified a "best practice" to be described and analyzed in greater depth, and to be shared and applied in similar contexts. Among other things, the Second International Congress saw the sharing of experiences and exchanges of "best practices" as central to fostering the development of TVE.

Specifically, the three case studies had two main objectives:

1. to share and learn from innovative and successful experiences in promoting and implementing TVE programmes/projects, and

2. to contribute to national and international discussions on reform and renovation of TVE policies and practices to address the rapidly changing employment scene and other socio-economic challenges of the 21st century.

As a follow up to the case studies and as part of the UNESCO long term programme in TVET (also known as UNEVOC), a sub-regional seminar was jointly organised by UNESCO Principal Regional Office of Asia and Pacific (PROAP), Bangkok and UNESCO Office Beijing, in Chiangmai, Thailand from 26 February to 1 March 2001. A total of 13 participants from Bhutan, China, DPR Korea, Republic of Korea, Nepal, Thailand and Vietnam participated in the workshop. They shared and acquired innovative and successful experiences in promoting the development of TVE, and discussed the renovation of TVE policies and practices in the region (final report is available from UNESCO PROAP).

This collection of the three case studies from the three countries has been prepared in the hope to widely disseminate and share the experiences with those involved in TVE.
Disseminating New Technologies as a Catalyst for Change in Rural Production

A Case Study of Beijing Agricultural School, China

Education has a significant potential to raise the quality of life of all people. The genesis of change, particularly in rural areas at the grassroots level, has continued to be an insufficiently documented area from both the practical and theoretical perspective. This case study of the practices of an agro-technical school attempts to highlight some key goals crucial to bringing about desired changes in China. These changes include a government commitment to empower rural villagers with new technologies, the provision of information necessary to promote the entrepreneurial capacities of rural communities, and an incremental approach to provide the rural population with accessible strategies and motivating reasons. Above all, these changes have improved both the lives of rural people and the capabilities of the school. The communities have obtained new expertise, resulting in more profitable and rewarding production. Beyond its current capacity as a training school, the educational institution has also acquired the additional role of being a community resource centre for the villagers. These new programmes have thus benefited all parties involved.
Rural Context

China is a dominantly agricultural country, with 900 million of the 1.2 billion total population living in rural areas. The status of rural development has always been the primary concern of the nation.

Rural economy has experienced three major shifts in China over the past 50 years. Early in the 1950s, the property of local landlords was divided among all rural families after the liberation. However, many individual households could not make a decent living due to their lack of material resources. Consequently, a collective sharing system was devised in the late 1950s, the People's Commune System. Productive benefits were equally shared among the commune members regardless of the contributions of individuals. This resulted in a general lack of motivation and poor productivity. In fact, serious starvation and massive poverty occurred in many provinces. Late in the 1970s, the Commune System was replaced by the so-called “family contract system.” In the new system, farmers could work as a family with only a meager rent in the form of grain payable to the state. Now with improved resources, including larger family size, better seeds and fertilisers, the majority of the rural population managed to provide enough food for themselves, and were generating a surplus by the 1980s. Following progress in production systems, an increasing proportion of rural labourers were no longer needed to farm their traditional crops of wheat and corn. Around 1990, a surplus of 100 million rural labourers was reported. Accordingly, production patterns and income sources need to be expanded. It is predicted that some farms will join community economies on a voluntary basis for more cost-effective production in the near future.

In the context of this development, the Chinese government proposed a rural economic pattern late in the 1980s, known as the “integrated development of agriculture, science/technology and education.” It aims to disseminate relevant scientific knowledge and technologies of production among rural community members, especially the youth, through both formal and non-formal methods of education.

China has succeeded in providing basic learning to all people, through a massive literacy campaign and the universalization of 9-year compulsory education. The literacy rate is 85% among youths and adults, and 85% of students complete the primary level of education. However, there is an inadequate acquisition of vocational skills. A recent report reveals that among active rural labourers, 60% have completed their 9 years of schooling but have only received short-term vocational skill training. There are only 16 qualified technicians for every million farmers.

The country is managed by governments at the state, provincial, city, county, and township levels. A village is the essential organisation of the rural community; there are currently 804,000 administrative villages across China. The villages are thus the best places to start vocational interventions. This study focuses on a cluster of villages in Fangshan District (County) outside the Beijing Municipality.
Beijing Agricultural School

Beijing Agricultural School (BAS), established in 1958, has 350 teaching and support staff and a total enrolment of 4,000 students. They study plantation, poultry, construction, engineering, accountancy and management, hotel service and management, and home electronics. BAS has 32 laboratory experiment farms on its 72.5 hectare campus, specialised in vegetables, grains, fruit trees, flowers, fish, poultry, feed processing, and chicken breeding farms. These are not only training fields but functional farms as well. Within this study, the primary focus of enquiry is the interventions of BAS for village-based rural development.

Methodology

The current study was undertaken by the Beijing Academy of Education Sciences within the framework of a UNESCO regional survey on the best practices in vocational education, carried out between June and November 2000. Following a general survey of many kinds of vocational institutions, BAS was selected as the focus of investigation. During the initial stages, it became apparent that BAS was a good example of excellence in vocational education. Additionally, they welcomed the "interaction" as an objective evaluation of their endeavours, and were very willing to cooperate. The project was then redefined for BAS, and data collection began. Field observations, group interviews with village leaders, family visits, and group discussions with BAS staff were all used to investigate the practices of BAS, as the staff of BAS was also performing its own data collection. In October a draft report was prepared and was finalised in November during a meeting between the BAES team and BAS staff. Teamwork was used throughout the enquiry process. The results of the study are a substantial report with necessary illustrations, accompanied by a 20-minute film demonstrating the teaching processes.
BAS Intervention

Origin

BAS began its involvement in rural development in the early 1990s, starting with voluntary service to assist local farmers to generate income. In 1995 the National Federation of Agricultural Sciences proposed a “Pilot Project on Empowerment of Villages with Technology and Education” which was formally initiated with government support, assisting Hebei, Shanxi, Anhui, Henan, Beijing, Shaanxi, Laoning, Jiangsu, Zhejiang, Jilin, Sichuan, Guizhou, and Ningxia provinces. Altogether 3000 villages became involved in the project. The overriding objective was to disseminate productive agro-technologies and new expertise to villagers by all educational methods; with these technologically advanced methods they enhanced the productive capacities of the targeted villages.

Principles

BAS was involved in the project as a resource centre. Five broad principles were followed to design the actual interventions:

- Help the village to develop an implementation plan, bearing in mind the local resources
- Upgrade the technological competencies of farmers through both formal and non-formal training programmes
- Disseminate a series of new agro-technologies among the villagers
- Promote the village-based collective production of at least one product as an effective income source
- Strengthen the village leadership to effectively involve villagers in the proposed project
Interventions

Within the framework of the project, BAS implemented the following major strategies.

SCHOOL - VILLAGE PARTNERSHIP

Changyang Township Government and Beijing Agricultural School jointly created a contract for mutual benefits in three areas: both would promote the application of new technologies to increase productivity and income generation, BAS instructors would offer technical consultations for farmers, and BAS would offer training of agro-technicians through formal and non-formal means for the local villages and community members. BAS was thus a resource centre to facilitate rural development, while the local community became a market for BAS expertise.

During field visits, researchers were informed by the villagers of Yang Zhuangzi village that local people had followed traditional methods of farming and animal husbandry for many years. BAS became involved through on-site demonstrations, short-term training programmes and regular guidance. The villagers have now begun to change their production methods, especially in the areas of pig and cattle raising and orchard keeping. They are now prepared to engage in greater production. The village leader told us, “We became fully convinced that the technologies can indeed make a difference.” The intervention of BAS inspired the villagers and whet their appetites for further knowledge and skills.

PROVISION OF VARIOUS TRAINING PROGRAMMES

Effective training programmes are necessary to encourage the study of new technologies and help villagers acquire more productive techniques. BAS has operated three major training schemes. The villagers could enrol as part-time students of the school through both distance learning and lectures. Graduates who achieve the necessary qualifications can be granted diplomas after three years of study. Every year, 1200 village leaders are enrolled in intensive courses through BAS to provide a more supportive leadership at the village level. Each programme lasts from 3 days to 2 weeks, focusing on a seasonal topic. Finally, technician training occurs primarily through the standard BAS formal programmes. Each year, about 1000 graduates return to their villages to apply their new skills. Wang Libao is a good example.
Story of a BAS Graduate

Wang Libao graduated from BAS in 1990 and then returned to his hometown, Zhenluoying Township in Pinggu County, a place with resources favourable for growing trees and fruits. However, fruit production was only done on a small scale with inadequate profits due to the continued use of traditional operations and degeneration of farms. Wang was put in charge of training new fruit production techniques in the township. Every day he rode his bicycle between villages to demonstrate practical techniques for orchard management, pruning, and disease prevention. Gradually he became popular in the township and was appointed by the local government to be responsible for agriculture and technology. Then he began a series of interventions, such as investigating the current status of forests and orchards, analysing the poor performance of orchards, and planning for entrepreneurship. Media publicity and on-site demonstration were used to teach these new skills, and he began to introduce incentives for villagers to rent barren land. By the end of 1996, four major products were grown on household farms: sweet chestnuts, high-quality pears, late maturing peaches and high-quality walnuts. There were 140 fruit trees for each person in the township. Additionally an integrated tree-grain growing technique was initiated, using a short-straw but high-yielding crop from America. This resulted in 500 tons of grain and additional profits of 1.3 million yuan. The new approach was so successful economically that it was identified as one of the most effective technologies in the Beijing Municipality. The township government said, “Libao is quite diligent and practical with a dedication for promotion of the villagers’ welfare. Rural villages are badly in need of this kind of technicians.”

From Wang’s story, it becomes apparent that the effective dissemination of new expertise can prepare communities for productive economic engagements. The role of the committed and capable technician is critical indeed to this process. Wang’s story is also a good example to the credit of BAS programmes. BAS reported that from 1998-2000, 61 training workshops were organized on 23 new technologies and trained 7084 villagers.
FIELD CONSULTANCY SERVICES

Plantation and animal husbandry are the two major endeavours of the rural population, and are also the specialities of BAS. Beyond the formal training programmes, the school instructors have made persistent efforts to provide technical supervision to households in the areas of pig, poultry, and sheep raising, vegetable and mushroom growing, and the management of cottage fruit and flower economies.

Wei's story was not alone on the BAS campus. Mr. Wang Zan taught how to prevent disease in vegetables, and Mr. Li Yubin taught productive raising techniques.

Beyond field services, BAS has operated campus-based programmes on such topics as chicken raising and arranging flowers for local villagers every Friday afternoon to share their expertise. They also started two hotlines using the public telephone network, with eight senior technicians on call to offer free consultations for individual households. Since this operation began in September 2000, they have received frequent inquiries every day. Most questions relate to plantation and poultry breeding and have been answered by relevant advice from the BAS staff.

Mobile Technician

Mr. Wei Yonglin, a BAS senior instructor specialising in plantation technologies, has committed himself over the last two decades to offer voluntary consultancy service for village orchards. He began his field visits riding a bicycle and went through a dozen tyres before purchasing a motorcycle. However, even the motorcycle could not last long through the frequent trips Mr. Wei made from the school to the villages, so he replaced it. In the end, he exhausted seven motorbikes for his devoted work.

In the field, he conducted on-site training programmes in more than 200 villages, demonstrating planting and management techniques for fruit trees. Topics included orchard planning, the selection of fruit strains, cultivation, fertilisation, irrigation, disease prevention, and other techniques. It was estimated that around 10,000 villagers benefited from Wei's personal guidance over the years. Over 1000 young people have been trained to be para-technicians in their local communities. In addition, he has operated a pilot project on fruit production in Fangshan District for 20 years. Their apples are favoured on the market.

The villagers were so grateful to Wei that they requested that the local government award him officially.
DEVELOPMENT OF NEW TECHNOLOGIES

Rural economics are dependent to a great extent on the application of technology to production. The ability of an educational institution to aid its beneficiary group depends on its potential to strengthen and make full use of its own resources. In the case of BAS, a vigorous pursuit of new technologies has been advanced in response to the technology-based future of agriculture. They realized that technological innovations and the dissemination of knowledge could facilitate the rural economic transformation from traditional, labour-intensive agriculture to modern market-oriented and specialized agriculture. To this end, the following projects were carried out in the field:

Project 1. The faculty and staff of the Plantation Department of BAS went to 400 villages to teach concrete techniques. Topics included fruit tree planting, protection for trees and vegetables, fertilization formulas, greenery design, planning of gardens and plant nurseries, processing and preservation of vegetables and fruits, and an introduction to new strains and innovative methods. 500 households became involved with these new technologies, testing them over an area of 667 hectares.

Project 2. Da Xing county requested that BAS graft pear trees over 133.4 hectares and plant an additional 53.36 hectares with additional pear trees. BAS helped by introducing productive plants from Japan and Korea and training more than 30 local grafters. They could graft 800 plants per day with a 95 percent success rate. Now the villagers can graft the trees themselves and help increase their own economic output.

Project 3. BAS has established a network of 37 practice bases in rural communities over the last decade for both plantation and livestock. These bases were usually started as pilot project sites and now serve as experimentation, demonstration, and training places for both students and community members.

New Hope

Yang Chunxing lived in a sandy valley and his family, including two parents, his wife, and four children, depended on his small income from field labour. The family was too poor to afford a new table. Wei, a BAS plantation instructor, helped Yang plant a plot of grapes. Two years later, Yang made 7000 yuan from the products, and was contracted to plant 4.669 hectares of the deserted sandy land with three other families. Wei returned to show them techniques for planting grapes, peaches, and strawberries. They now have a profitable business. Yang has parted from poverty and can afford home electronics and a vehicle for the family.

Wei seeks no remuneration for his efforts, regarding them as his voluntary obligation.
Increased Economic Benefits

Twenty years ago, Wei, a BAS instructor of plantation initiated the Fuji apple project in Lucuan Village, the first specialised village near Beijing Municipality. Now, with significant expansion from 3.335 to 106.72 hectares and an increased fruit-bearing season from early June to late October, the village has enjoyed better fruit harvests and economic returns over the last 15 years. Wei’s technical assistance has been estimated to bring over 3,000,000 yuan to the village.

Project 4. BAS technicians have helped local villagers to solve their problems with new technologies. Productivity has increased as a result of learning plant protection practices, upgrading to new strains, and effective management.

Two Stories of Curing Disease

Mr. Wang Zun is a BAS instructor specialised in plant protection. He spends all his time away from campus teaching new technologies to protect against plant diseases in rural communities. As the technical advisor to Guolin Orchard, Fangshan District, Wang helped the villagers early in 2000 to develop a plan for disease prevention. He taught them techniques for insect prediction and the proper selection, amount and timing of pesticide application. As a result of his efforts, 42.7% fewer pesticides have been used with better results. Previously dominant diseases have been wiped out, yielding a good harvest. Wang has also conducted several programmes to train local technicians on the physical protection of fruits and vegetables.

Fangyuan was a large-scale pig farm in Huairou County, merged from eight small farms early in the 1990s. The farm suffered from several diseases with a high rate of mortality. Two thousand deaths occurred in 1995 alone, with losses totalling 200,000 yuan. When these problems were combined with poor management the farm could hardly operate properly. In November 1995, Mr. Li Yubing, a BAS technician, was contracted to help. He first grouped the pigs for separate treatment and instated the process of regular immunisation. After six months of intensive work, the farm started to make profits.
A Case of Systematic Intervention

Xinguang chicken farm is a fine-breed chicken farm with 50,000 pairs of stock in Pingxiang County, Hebei Province. The farm performed poorly due to inadequate supply of improved breeds as well as a lack of new technologies, efficient management and marketing. Upon the persistent request of the farm, BAS dispatched Cao Jiyuan, a senior technician specialized in poultry technology to work as a consultant for half a year. Based on in-depth field investigation, Cao identified the potential needs of the farm, proposed new initiatives for intervention and organized the farm staff to develop action plans for improvement. He also conducted a series of staff training workshops on poultry technology and follow-up services. At the same time, he offered community villagers consulting services on matters concerning poultry farming. In one incident when an unidentified epidemic disease occurred in Xingtai, the epidemic was successfully controlled and villagers’ economic losses were kept well under control owing to the prompt and effective measures taken by Cao. Besides, Cao has also made effective efforts in expanding the market for selling young chicks to cover much wider areas. Cao was not alone in his efforts. BAS poultry technicians also worked together to create innovative practices for teaching, including the establishing of poultry service centres in communities where chicken- raising is the major source of income, and demonstrating new managerial practices to prevent infectious diseases among the livestock. As a result of this systematic intervention the farm improved its situation in the second year.
Project 6. Research and development of new processes for agro-technological advancement. Innovative research and experiments were found to multiply the productivity of rural farmers.

Project 7. BAS has made new efforts to expand its programmes and extend the coverage of its technical assistance. Training packages have been developed for several formats: printed materials, videotapes, and computer software. These can be used in training workshops or community learning activities. So far, BAS has developed 83 training packages covering plantation, livestock, civil construction, accountancy, and business management. BAS also maintains its two telephone hotlines where villagers may call experts for advice.

Operation Mechanism

The success of BAS programmes is due to its innovative methods along with continued exploration processes. Their methods include the adjustment of school programmes to meet the needs of the rural population, active participation from local villagers, an incremental approach to expanding their pilot programmes, and the integration of new technologies and entrepreneurship. These have all been employed to help increase the productive capacity of rural technologies while the school still retains its formal educational function.
IMPACT OF OUTCOMES

The BAS extension programmes, as illustrated by numerous innovative practices in rural settings, have had significant impacts in the following three areas:

ECONOMIC ASPECTS

By adopting new technologies, the villagers have learned techniques to increase production and increase profits. Their ability to increase their income has been enhanced, allowing them to enjoy an increased quality of life. For example, Yang Zhuangzi Village has experienced great change in the villagers' income levels following the application of new technologies and expertise to the areas of growing crops, producing livestock, and civil construction. The annual income level of each household has increased from 13,400 yuan in 1990 to 19,900 yuan in 1995 and an estimated 38,000 yuan in 2000.

For BAS, it has been satisfying to see the economic consequences of the application of their technological prowess as the lives of the rural villagers improve. In return, the teachers and the entire school have increased both their professional and economic interactions with rural communities. In fact, the distribution of new technologies has become a profitable business for the school.

EDUCATIONAL ASPECTS

Beyond the established formal training programmes, BAS has assumed a new role, to be a force for direct intervention in rural economics. They have grown from simply providing a school education to assisting with rural economic development. It is also important to bear in mind how this has benefited the school. The curriculum has been broadened to become more responsive to the needs of the rural population. The staff members have learned from their involvement in village programmes and BAS students are receiving direct exposure to the processes of enhancing rural life as an integrated part of their training. The school infrastructure have also been strengthened, in particular the experiment facilities of test fields, animal management technique testing grounds, and rural mechanics services. BAS, with both its formal training programs and non-formal methods for upgrading the technologies of rural villagers, is a resource centre for community development and an agent for change.
CONCEPTUAL ASPECTS

The study enriches our understanding of the interactive partnership between the agricultural school and the rural community with the following lessons:

- Rural development can be significantly facilitated with new technologies introduced through non-formal educational methods;
- Disseminating technologies for community development makes it possible to increase cooperation between the school and villages for their mutual benefit;
- To actualise the potential contribution of technical and vocational education to meet the learning needs of the rural population for a better quality of life, proper incentives should be made available and consistent. For example: governmental policies to encourage the endowment of rural communities with modern technologies; education and training institutions with prepared intervention strategies; community leaders and villagers ready to participate; and a supply of relevant expertise and integrated support throughout the transition process, from training to production and marketing.
- The active involvement of BAS has also proved to be a process of change in itself. Now BAS functions not merely as the training institution for future rural technicians, but also as an incubator of new technologies and a resource centre for villagers' productive economic activities and rural community development.

BAS is also faced with many challenges as a result of this expanded role. They must decide how else to expand their services, how to evaluate their new practice and its implications for education at large, and how to sustain their partnership with rural communities in the long run.

This study has highlighted the efforts of a technical school to bring about changes to rural communities in China in the 1990s. More research is needed to fully understand the potential role of education in bringing about social change in the rural context.
On-Site Training for Vocational Education Students

A CASE STUDY OF SONGYO TEXTILE SPECIALIZED SCHOOL, DPRK

The educational system in the DPR of Korea has improved greatly over the past 50 years. Various methods of vocational education are used to help the people prepare for future employment. To ensure the quality of this education, teachers are often retrained in new methods and practices used in the field. A crucial element of vocational education is site training. The Songyo Textile Specialized School is an example of a vocational school that provides its students with training at local manufacturing institutions. Through cooperation with local factories, students are well prepared for their field, be it spinning, tailoring, or knitting. The students are thus ready to work in modern facilities and there are benefits for the manufacturers as well.
INTRODUCTION

EDUCATION IN THE DPRK

In 1945, following the restoration of the country's independence, 80 percent of the adult population in the DPR of Korea were illiterates of whom women accounted for 81.3 percent and peasants 90 percent. More than 65% of school-age children had no access to primary education, and high tuition costs forced thousands to drop out every year. For those few with an education there were no colleges or universities to further their studies. Educating the people was thus set as a high priority of the new government.

As a move to promote and universalize education in the DPR of Korea, compulsory education was first introduced at the primary level (four-year course) in 1956. This was followed by the introduction of the seven-year compulsory secondary education in 1958. Since 1972, the eleven-year free compulsory primary and secondary education has successfully been in force. Adult education has also been promoted, thereby helping to raise the general educational level of all the population, including women, to the secondary level or higher.

At present, the state provides free education to 752,000 children in 14,303 kindergartens, 1,610,000 children at 4,933 primary schools, and 2,182,000 students at 4,812 secondary schools. In addition, 179,000 students receive free education at 431 specialized schools, and 414,000 students at 308 universities receive state stipends for their education.

TECHNICAL EDUCATION AND TRAINING

With the rapid development of science and technology, all domains of the economy increasingly demand for skilful technicians and specialists. In recognising the important role of technical and vocational education in socio-economic development, the government of the DPR of Korea has placed great emphasis on its promotion and development. It is provided largely through the following systems: regular education system via secondary schools and specialised schools, and field education system via vocational schools.
Both the regular and field education systems intensify basic technical education and specialised technical education. The former places emphasis on the choice of subjects, for example, electronics, automation, theoretical dynamics and material dynamics. Sequence of subjects is also ensured. The latter actively introduces the latest achievements of science and technology in a specific field. It also imparts technical skills of operating electronic automation equipment and other modern technical means.

SECONDARY SCHOOLS

In secondary schools, technical studies are incorporated into the curriculum in the last two years of secondary education. Students learn the basic principles of production and technology and study how modern technical equipment is used. They also acquire practical skills based on specific regional characteristics and needs of the local community. For example, schools near factories teach skills needed by workers in that field, whereas students in agricultural areas study farming techniques, technical details about tractors and other machinery, and crop chemicals and fertilisers. In addition, specific technical knowledge and skills are taught to girl students through "Girls' Practical Skills".

SPECIALIZED SCHOOLS

Specialised schools under the regular education system play an important role in the provision of technical and vocational education in the DPR of Korea. Two-and-a-half or three-year specialised courses train graduates of secondary schools to become junior engineers with knowledge and skills in a specific field. The schools set the quota for training technicians and skilled workers in each field, taking into account the national economy and regional variation. In order to help students consolidate and apply what they have learnt in theory, more than half of the curriculum time is devoted to productive and professional practice via a system of practice workshops and work-teams in neighbouring factories and enterprises. Such practice workshops and work teams play a significant role in enhancing the level of technical and vocational education of various specialised schools through ensuring sufficient educational practice. They are equipped with installations that are in line with the educational objectives. Apart from the regular form of specialised schools, evening and correspondence courses are also widely organised in such schools to upgrade in-service workers to junior engineers or skilled workers with the same level of competence as that of regular school graduates.
Vocational Schools

Vocational schools are located in the field. Large factories and industries run these schools in the DPR of Korea. They enrol secondary school graduates and in-service workers for 6 months to 2 years, depending on the field. Practice constitutes about 60 to 80 percent of the curriculum time. The government has established a system of day-to-day technical and functional study so that workers and farmers are engaged in regular study and skill improvement to keep abreast with changes in the world of work.

Technical Teacher Education

To improve the quality of education, technical and vocational teachers must continually upgrade themselves and acquire new techniques in their fields. They must also have a strong background in teaching and lecturing skills, and the ability to weave new techniques into the curriculum. Secondary school teachers are retrained for 15-20 days a year during the summer and winter vacations. They also go through a two or three month long intensive retraining every four or five years. Teachers at technical universities, specialized schools, and factory colleges are retrained by the appropriate technical universities, and are retrained intensively every three to four years.
**SITE TRAINING**

Site training is also important for the vocational students. Programmes between training institutions and factories give students the best preparatory experience for future employment. Without practice in a real factory, students will only have an intellectual understanding of the manufacturing processes. However, by working at a nearby factory, students will have experience with the real machines they will use someday. Through site training at a local factory where they will most likely work following graduation, students become familiar with the working conditions and fellow employees.

**SITE TRAINING PROGRAMME**

Songyo Textile Specialized School in DPR of Korea is a model for cooperation between vocational education institutions and manufacturers. Through the site training process, students gain experience with modern and appropriate equipment. The factories chosen follow the serial production methods used in reality, where employees do the same step in the manufacturing process repeatedly; workers do not perform all steps in the process for a single item. Students are given first hand experience with every stage of the complicated manufacturing process. This type of practice is best experienced in a factory setting, where efforts result in marketable products.

**COOPERATION**

The Songyo Textile Specialized School works with local factories to provide site training for students. There are several courses of study at Songyo Textile Specialized School, so students are sent to appropriate institutions for their future careers. Students who study spinning, weaving, and dying receive real experience at the Pyongyang Textile Enterprise. Knitting students practice at both the Songyo Knitting Factory and Pyongyang Knitting Factory of Children. Songyo Tailor Factory, Tongdaewon Tailor Factory, and Pyongyang Tailor Factory all train tailoring students from Songyo Textile Specialized School. By working together with these institutions, the school is able to provide a more complete educational experience for its students.
SITE METHODOLOGY

Planning is required for a successful site training programme. Appropriate manufacturing institutions must be selected for the students' areas of study. Then arrangements must be made with those institutions so that they can prepare for the students; the selected factories and enterprises will be given notice 6 months prior to the beginning of the training, so that they are ready to integrate the students' site practice into their overall production and training plan. The site training is divided into two stages. First, the field practice teacher lectures at the manufacturing plant. Every machine and product is covered in this manner, easing the students into the work setting while maintaining a traditional lecture format. The teacher is also able to relate real-life experiences with the prior teachings at the school. The on-spot lectures are given separately for each individual occupation, machine, product and manufacturing process. The second stage is actual application. Technicians and highly skilled workers at the factories help the students improve their skills and abilities. The students learn how to operate the machines and study their structure. The entire manufacturing process is also covered, from the preparation of material to the processing of goods and, finally, to quality inspection. Of course they also learn the finishing touches that distinguish the goods produced at their factory. The site training usually lasts from 16 to 18 weeks. The students acquire skills and techniques, which prepare them for a final evaluation. The programme has benefits for the manufacturers as well, since the students practice on goods they can later sell, reducing their labour costs. Clearly, everyone benefits when vocational students practice at manufacturing institutions.

ANALYSIS

The site training programme at the Songyo Textile Specialized School is an excellent example of cooperation between business and education. The school works together with the management at the factory to ensure effectiveness of the site training. The teaching responsibility is shared between both organizations, with the first phase taught by an instructor from the school and the second phase taught by factory employees. Students, teachers and employers benefit through this joint teaching process by fully utilizing the physical and human resources. Apart from the teachers, engineers, technicians and skilled workers of the factories can function as trainers, while students and teachers can best use the machines and other equipment in the factory without cost. Therefore the financial burden to the government and the school has been greatly reduced.
The National Case Studies on Best Practices in Technical and Vocational Education in China, DPR Korea and Mongolia

**Benefits to Students**

Students are the most obvious beneficiaries from the site training programme. They are exposed to the techniques and machines used in real industry, rather than only receiving theoretical experience in the classroom. They also gain confidence in their ability to work in an actual employment situation. Furthermore, they form contacts and friendships with the employee teachers, one more reason to work with the company following graduation.

**Benefits to Teachers**

Teachers can also benefit from the site practice. Their theoretical knowledge and practical skills are much more intensified than within their normal classroom teaching and pure desk research activities which do not allow for such intervention. Since site instruction needs more vivid skills of lecturing and organizational competence, high qualification of teachers is required, which in turn enables them to take the opportunity to develop their professional skills.

**Benefits to Industry**

The programme has benefits for the manufacturers as well, since the students practice on goods they can later sell, reducing their labour costs. Also, the company can later hire these students with the confidence that they will be able to work efficiently and effectively in their production lines. The current employees who train the students gain pride in their own abilities, having been selected to pass their superior techniques on to new workers. Inspired by that pride, they will work more loyally and dedicatedly for the manufacturer in the future.

Through the site training programme at Songyo Textile Specialized School, students experience first hand how to work the machines they will operate in their future employment. Employers know these students are ready to work. A programme such as this with benefits for all should be an inspiration to everyone involved in technical and vocational education.
A new vocational education system is needed in the transitional period of contemporary Mongolia to adapt to a changing society and help the country emerge from economic difficulties. An innovative project to join general and vocational education at the No. 7 School in Ulaanbaatar has successfully given students professional and general knowledge. The project combines traditional schooling with hands-on practice at local vocational colleges. Without this programme, these students would not have been able to afford tuition at vocational schools and would have been left without job skills. Most young Mongolians in this situation quickly become unemployed, but these students are able to learn the technical and vocational skills that will lead to employment. The programme, funded by the local government and private donations, gives them new hope. No. 7 School works with the Arts and Crafts College and Building Construction College, along with several other agencies, to ensure that the students are well prepared for the future.
The Status of Modern Mongolia

ECONOMICS

Since the 1990s, Mongolia has fallen into a deep social and economic crisis. This is due to mistakes made during the transition from a socialist to a market economy, and the collapse of the USSR, a source of economic support. The standard of living has dropped as several state industries were closed, and there is a lack of retraining opportunities to aid the unemployed. Global prices for gold, copper, and semi-processed cashmere, Mongolia's primary exports, dropped drastically, resulting in a 15% loss of GDP. A harsh winter in 2000 led to a loss of 8.1% of Mongolia's livestock, creating problems in the rural sector. According to the 1998 Living Standard Measurement Survey, 30% of the urban population is unemployed, whereas only 12% of the rural population is without work; the national rate is 19%. In 1998, 35.6% of the population lived below the poverty line, which breaks down into 39.4% among the urban population and 32.6% among the rural population.

EMPLOYMENT

Almost half of the Mongolian population is of working age, and the population is increasing. Agriculture employs almost half of the population, with 12% in manufacturing and 10% in service and trade. Creating new employment opportunities will be crucial for the country, as there are currently unemployment problems that exist and will only worsen as the population grows. Unemployment insurance has been available since 1994. However, one must pay into the system for at least 24 months to qualify for assistance. At the end of 1999, 39,700 Mongolians were registered as unemployed, but over 130,000 people are estimated to be self-employed or unemployed but not registered. Due to the dispersed nature of the rural population, accurate counts are difficult in Mongolia. 65% of the unemployed are youth aged 16-35, due to a lack of experience and appropriate skills.

EDUCATION

Local schools are underfunded due to Mongolia's economic situation. Several are closing down due to a lack of electricity and heating. Between 1992 and 1994, one-third of the children left school because their families could not afford the expense. Before the economic troubles in 1989, 97.2% of the population was literate. By 2000 this rate was down to 96.5%. Only 27.3% of children enter pre-school, and 93.8% of children attend primary school. Thousands of children cannot continue their education following primary school because there are not enough spaces in schools. Therefore, following grade 8, only 25-30% of students continue their education, 10-15% attend technical and vocational schools, and 40-60% work.
However, they only have few job skills because there is no vocational training in primary school. They easily become unemployed and roam the streets. Street children are a growing problem in Mongolia. Of Mongolia's three thousand street children, 60% are in Ulaanbaatar and 30% are girls. 63.5% of them are illiterate, and the remainder only have a primary or secondary education. None have professional skills, so they cannot find work and remain in the streets.

Technical and Vocational Education

Clearly solutions are needed to help the large percentage of the Mongolian population that is untrained for work. Technical education and vocational training (TVET) is essential, so they will acquire skills and become successful employees. Several industries collapsed following the transition to a market economy, leaving even more people without jobs. TVET was then not a priority for the government since newly trained workers would still not be able to find employment. Recently new enterprises have been started through the privatisation of industry and the creation of small and medium sized businesses. They bring promise that regenerates the hope for economy and provide new jobs. The nation still needs knowledge from foreign countries to learn modern technologies and entrepreneurial skills, so even more new businesses can flourish. More and new TVET is, again, necessary in Mongolia to help the society grow and prosper. More and new TVET is, again, necessary in Mongolia to help the society grow and prosper. At present, the most needed skills are in the fields of construction (foreman), sewing, photographing and hairdressing. To cater to the newly arising large demands of vocational education, a new section on TVET has been established under the National Institute for Education; the National Programme on TVE has also been formed. Vocational schools have tuition rates that are too expensive for many poor families. One of the reforms carried out, therefore, is to explore innovative methods of vocational training in order to reach all citizens.

The Mongolian government, with assistance from the Asian Development Bank, designed strategies for the development of TVET in 1999. The first goal is to adjust TVET to better meet the needs of the market by evaluating the market and population and providing appropriate career counselling. National standards and examinations for vocational aptitudes is another goal to improve training and strengthen cooperation between educators and employers. Improving teacher training and upgrading is also important, so that current skills are being taught. By upgrading facilities, students will be prepared to work on the equipment they use when employed. Students will be taught most appropriately with new, updated textbooks. Finally, the Mongolian government plans to reconfigure finance strategies for TVET programmes to allow the previous goals to be achieved. When these goals have been achieved, TVET should be available to those who need it. Innovative methods that minimise expenditure and maximise results should be identified, rewarded, and implemented everywhere. The project at No. 7 School in Ulaanbaatar is an example of such a programme.
**Vocational Class at No. 7 School**

**Target Group**

No. 7 School in Ulaanbaatar is located in a poor, suburban district of the capital city. Since the 1993-1994 academic year, a pilot project to link general and vocational education has been successfully implemented. This school was chosen because of the low income levels of the district; most graduates of general education have no professional skills and quickly become unemployed. This program sought to help those who need it most. Only one of the 4-6 classes at grade 9 and 10 are part of the project. Students at this age were chosen because they are at the proper age for this training, and they have completed their mandatory basic education which must follow the same curriculum in all schools. The students are selected based on their personal interests and their parents' requests. Chosen by the students, the skills for the following positions are taught: sewing industry worker and tailor, electric and/or gas welder, lathe operator and electrician.

**Sponsorship and Support**

The governing board of No. 7 School implements the general-vocational education project. They meet twice a year to receive the director's report, plan the training activities, and determine the annual budget. Between meetings, the school director heads the project, and teaching methodology units of the school set the curriculum. For this project, the curriculum receives comments from the Arts and Crafts College and the Building Construction College. The curriculum is also reviewed by the Institute of Education and the Ministry of Education, Culture, and Science.
The Arts and Crafts College and the Building Construction College assist the project further by conducting theoretical and practical lessons and holding exams to students. The Association of Employers of Ulaanbaatar also observes the project, giving advice on the activities, attending final examinations, and assessing the skills of students. The Labour Coordination Department of Han-Uul district, where Ulaanbaatar is located, and some factories affiliated with the Association of Employers have also been involved with the project.

The local government of Han-Uul district funds the project. The basic educational costs are provided by the local government in accordance with Mongolian Education Law. Supplementary funds necessary to finance the additional cost of vocational training, including factory internships and part time teachers' salaries, are taken from the Poverty Alleviation Fund which the local administration can use as it pleases. The vocational colleges also assist the project financially, by offering students a 50% discount for lunches, providing special uniforms for students, and paying the salaries of their teachers from the college. Private donations also assist the programme.

CURRICULUM

In the past, only compulsory subjects were provided in secondary schools. Starting from 1995 with the approval of the Education Law, selective courses have been established in the formal education system, which allows flexibility for students. With their parents' permission and teachers' consultation, students who plan to enter the world of work upon completion of secondary school education, are given the opportunity to select vocational courses of their interest while studying regular courses.
The vocational training project at No. 7 School in Ulaanbaatar was created through minor changes to the standard curriculum. The general curriculum includes time for school chosen elective subjects, 4 hours per week for grade 9 and 3 hours per week for grade 10. Along with the 2 hours per week set aside for “Construction and Designing” courses, this time is used for the vocational theory lessons. Students intern through the Arts and Crafts College and Building Construction College for three hours a week apart from classroom time. The curriculum focuses on the following major topics: sewing or building construction production technology, safety techniques, product aesthetics, labour legislation, workplace hygiene, machinery maintenance, productivity and assessment, and communication ethics.
Success

Since 1993, 80 students have completed their technical training through No. 7 School in Ulaanbaatar. Professional skills are awarded degrees from one to six, the sixth degree being the highest. The fifth and sixth degrees are only achieved following a period of time in the workplace. Students of the No. 7 school graduate with degrees III and IV. For example, V. Baigalmaa, one of the seventeen students in the initial programme, graduated with the 4th degree of sewing, finishing her general education with excellent marks. She was admitted to the Arts and Crafts College without taking the entrance exams and now works in her profession in Ulaanbaatar. The students that entered in the 1995-1996 academic year all graduated with the 3rd degree of expertise, 10 as sewing industry workers and tailors, five as electricians, and five as carpenters. G. Nyamsuren was granted admission to the Arts and Crafts college and is now qualified as a technologist-trainer. Students that graduated in 1999 were awarded degrees as follows: five carpenters, two at the 4th degree and three at the 3rd degree; eight electricians, one at the 4th degree and seven at the 3rd degree; all six sewing industry workers and tailors were awarded the 3rd degree. Students that entered in 1999 chose the following professions: seven are sewing industry workers and tailors, five are carpenters, and 10 are electricians. All those involved in the project hope these students will continue the traditions of the school and graduate with good professional knowledge and skills.

Analysis of Outcomes

Innovation

The vocational training programme at No. 7 School in Ulaanbaatar differs from traditional vocational and general education programmes in two ways. First, this programme opens new opportunities to poor families. Previously, the only way to get a vocational education was to study at a Technical and Vocational Training School. However, poor families could not afford to provide this kind of education. By adding vocational training to the general education programme, these students were able to learn important job skills they would not have had access to otherwise.
This program also demonstrates that it is possible to successfully combine general and vocational training. Prior experiments in Mongolia sought to bring vocational education into the classroom through designing, economics, and ecology courses. However this was not as effective as combining knowledge with outside practical experience. These innovative departures from tradition distinguish the project at No. 7 School.

**ADAPTATION**

The project is itself an adaptation to the needs of contemporary Mongolia. In light of the economic downturn, vocational training is an effective measure to avoid unemployment. Students and their parents requested that the programme should not extend school hours, so that only a few hours of internship a week were required outside traditional school hours. The programme was thus adapted to meet the needs of the students. The job skills taught at No. 7 School reflect the needs of the community as well: the students are prepared for local factories, helping the industrial sector and preparing students for successful employment.
COLLABORATION

The vocational training programme at No. 7 School has also been a good example for the collaboration between institutions. The finances of the school were boosted by contributions from about 300 individuals, following a 1996 law that reduced taxes for those who donated to educational programmes such as the one at No. 7 School. Thus the private sector has been involved, passively, in the success of the programme. The Ministry of Education, Culture, and Science, along with the Institute of Education and the local government of Han-Uul District have helped to facilitate the project as well. The greatest and most necessary assistance the project received was from the Arts and Crafts College and the Building Construction College. Without their instructors to teach practical lessons, committees to oversee final examinations, and facilities for the students’ internships, the project would not have succeeded. Finally, the efforts of the school and its staff were crucial to the project’s success as well. Without them, this project would not have existed at all. This involvement of many parts of the community shows how collaboration can lead to success in education.

REFLECTION

Community involvement in the project also ensures that it maintains its success and seeks improvement. If the public were not satisfied with the results, they would not give donations to the programme. The District Labour Regulation Office, Labour Market Office, and City Poverty Alleviation Committee have monitored and provided feedback on the project at No. 7 School. Curriculum is, of course, central to ensuring the success of the programme. The Institute of Education and the Ministry of Education, Culture and Science review the curriculum, maintaining the quality of the programme. Likewise, the involvement of the vocational colleges in both curriculum and teaching holds the programme to the educational standard of purely vocational institutions.

Another important determinant for the success of the project are the relevant policies made by the government. In 1996, the Parliament made the decision on exempting those enterprises and individuals from paying taxes who have provided financial assistance to educational institutions. From 1996 to 2000, a total of 17 organizations and 300 individuals have provided large amount of funds to support the TEVT programmes at No. 7 school.